Hobbies WEEKLY

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How to make an attractive STANDARD LAMP

THE graceful looking standard lamp shown in our illustration at Fig. 1, would be equally as useful alongside the piano as at the back of the arm chair. Such a lamp as this is excellent as an aid for reading when the main lamp in the room is not needed. It is, too, very restful for the eyes, the light being concentrated on the work in hand whether it be music or book reading.

Straightforward Construction

The work in making one of these lamps is most interesting, and at the same time does not call for any special tools or skilled work. There is scope here for the handy man about the house who has a simple kit of household tools, including, of course, a good fretsaw frame with a few coarse saws.

Work can be commenced upon the base, the general outline and dimensions of which are given in Fig. 2. There are two sturdy crosspieces or rails measuring 18ins. long by 4ins. by 2ins. in cross section, and after they have been cut off squarely and the centres marked across, the halvings are drawn in 1in. each side of the centre line and dropped down on the thickness of the stuff to half the depth to make a sound halving joint, as seen in detail (A), Fig. 3.

Simple Carpentry

A tenon saw is good for the cutting, while a small chisel would answer for the cleaning out of the unwanted wood. See that the halving joints fit well and accurately together and then glue them firmly. A ½in. diameter hole is next bored through the centre of the joint for the flex to pass through when wiring up the lamp.

The Feet

To form the feet below the cross rails, cut out four blocks 5ins. by 4ins. by ½in. or ⅝in. thick. Round them off on three edges and then glue and screw them to the extremities of the cross rails. Next make the upper members of the cross feet, the two rails (B), as seen in Fig. 3. These are each 17ins. long by 3ins. wide by 1in. thick, and on each, two mortises are to be marked out, as the detail shows, 3ins. in from the ends of the rails and the mortises are 3ins. long and 1in. wide. Cut them through with a coarse fretsaw, keeping just inside the drawn lines so as to insure a tight fit when the brackets are inserted.

Bore a hole in the centre of the rails and then halve them together in a similar manner to the thicker rails beneath. Glue and screw the rails to those below and finally clean up all the surfaces and round off the sharp edges with glasspaper.

The Pillar

The centre post can next be made, and this can be cut from the solid wood of 2½in. square stuff, or it can be made up from four separate pieces of ⅝in. wood glued up to form the square, shown in the detail Fig. 4.

The convenience of making the post hollow, as just described, will be found in that the flex can be taken up from floor level and threaded through the post to the bulb holder above. Whereas if the post were solid the wire would have to hang loosely from a wall plug and run direct and under the shade to the bulb holder, a hole being made near the top of the post for the insertion of the wire.

Whichever method is adopted the upright will appear the same and the corners can be planed off to a chamfer as shown, this work helping to lighten the appearance somewhat.

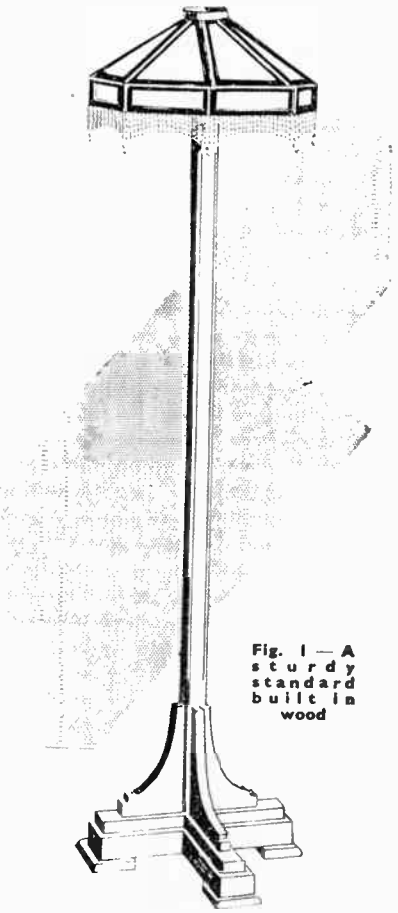


Fig. 1 — A sturdy standard built in wood

The post will measure 5ft. 2ins. long and it will be 2½ins. square. The four upright bracket-shaped pieces into which the post fits are each 9ins. by 5ins. by 1in. thick and they will be cut to shape, as the detail Fig. 5 shows.

The Shaping

Here is given a squared diagram with 1in. squares through which pass the outline of the shaping. Set out the squares on paper and draw in the outline following carefully each square from the smaller printed outline. Transfer the outline on to the wood and cut round in the usual manner. Clean up the edges with glasspaper and use the one cut-out bracket as a template for drawing round to produce the other three brackets.

It would make a stiffer fixing to the post if the brackets were recessed or housed into it for a depth of ⅛in. or $\frac{3}{16}$in. This amount would then have to be allowed and added on each back edge of the brackets to allow for recessing. The recesses in the posts would then have to be carefully drawn out 8ins. long by 1in. wide by the depth required.

Glue the brackets into their mortises and make sure they stand absolutely square and upright, and when the glue has hardened, insert the post, adding the glue in the recesses if these have been included in the work. Add a round-head screw or wood dowel pin through the top of each bracket as shown in the detail.

All kinds and shapes of shades can be purchased now, and many would not, therefore, spend the time and trouble in making one up specially for this lamp standard. There may be some readers on the other hand, who, having made the lamp standard, would like to undertake making the shade as well so that it could be said the complete article was wholly home-made.

We suggest, therefore, a way of making a simple octagonal shade 20ins. square and 7ins. deep. A piece of cardboard about 29ins. square will be wanted and the general lay-out of each section forming the shade can be seen in Fig. 6.

Shade Shape

The method of drawing any one of the sections is shown in Fig. 7. This outline is drawn to scale and allows for the 'rise' of the shade towards the top, so that when eight of these single sections are laid side by side, as in the layout Fig. 6, the parts are ready for scoring and cutting.

By scoring is meant those lines between each panel is cut in very lightly with the tip of a knife, thus enabling a bend to be made exactly along a line. The interior of each panel is cut away as well as the smaller front panel which hangs down, as seen in the front view Fig. 2. On the 8th panel in Fig. 6 is seen a marginal strip, this, when the whole is angled up, is glued to the edge of the 1st panel. Gummed tape cut to length required and put at the back of joins and creases help to strengthen the shade a good deal.

The Wiring

A flat, circular or octagonal disc is glued to the main top of the shade and the post. The socket and bulb is fixed to one edge of the post, not to the top as is usually done, the wiring then being carried through and brought down the centre of the post. If the post is solid, however, then means must be found for setting out the holder and bulb to allow the outside wiring as previously suggested.

Cover the card frame of the shade inside with tinted thin paper so that the light penetrates sufficiently. The card frame could be blacked over with indian ink or egg-shell black paint. Paint or stain and varnish the woodwork to choice. If the wood is all one class of material, such as oak or beech, stain it, but if odd wood colour with enamel.

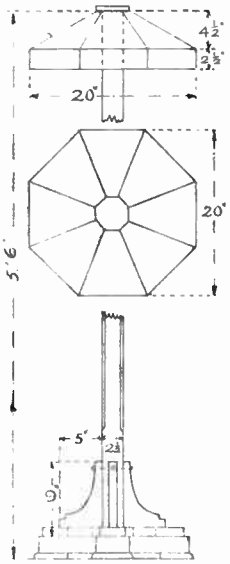


Fig. 2 — Section of standard and base

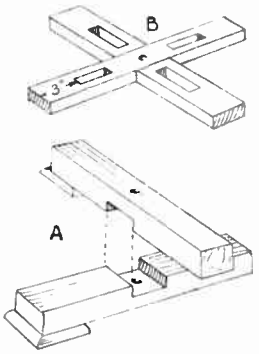


Fig. 3—Construction of base parts

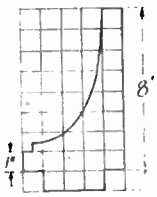


Fig. 5—Shape of support

Fig. 4—Section of pillar

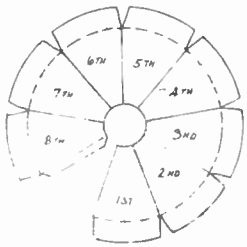


Fig. 6—Shaped shade panels

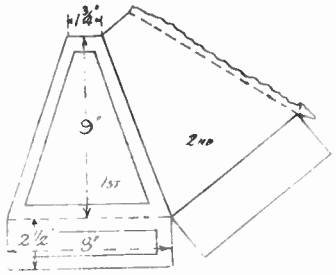


Fig. 7—Details of a panel shape

Tent Grease Remover

PLEASE tell me how to remove what appear to be grease spots, from the canvas of a tent, without harming the canvas. (R.L.—Bozeat).

TO remove grease spots from tent canvas is not easy, especially if the grease goes right through and shows on the inside. If a very old, dirty tent, why not scrap it for a new one? Or, you could try scrubbing with hot water and soap, adding a little Parazone to the water. Afterwards you could re-proof the tent on the outside with one of the preparations sold by the camp outfitters for that purpose. This would preserve the canvas and keep it rain-proof.

Alternately, if your tent is so dirty that it bothers you, it might be better if you dyed it a green or khaki colour. It is a good plan to dye it a darker colour than you would eventually like to have it, because it will soon fade a little after a time in the sunshine. Still another idea is to give it a coat of paint—the sort of stuff used to camouflage tents during the war. This would, no doubt, cover the greasy marks, and your tent would no longer be an eyesore.

• • •

Drilling a Vase

I HAVE a stone vase in which I wish to drill a hole for the purpose of passing a flex through, but up to the present I have failed. (A.B.—Leabrooks).

YOUR best plan would be to use a plain copper rod as a drill, and to charge it with diamond dust. This used with water as a lubricant, will enable you to make the requisite hole. In the absence of diamond dust, you could use very coarse carborundum grinding powder, but it will take much longer.

A helpful plan is to make the hole tapered, larger at the outside, so the drill does not tend to bind so much in the walls of the hole.

If the vase is very strong and heavy, you could support it (bottom upwards) on a sand bag and use a Rawlplug 'jumper' and hammer to drill the hole, but, of course, there is more risk of breakage.

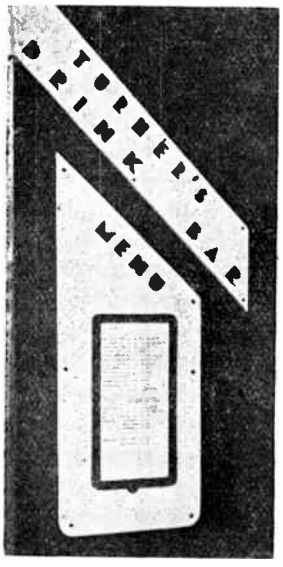
You should consider the possibility of making
PERSPEX DISPLAY SIGNS

THE making of Perspex signs for use as house nameplates or for commercial purposes such as shop nameplates or for display on vehicles, is both fascinating and lucrative. Few tools are required and though the outlay for Perspex may be higher than that needed for, say, wooden signs, the finished jobs are more attractive, more durable, cleaner and have a far greater 'pull' should the craftsman wish to make a commercial proposition out of his work.

Simple Type First

Those who have never worked in Perspex are advised to attempt the simplest type of sign first, an idea of which is given in Fig. 1.

This is a house nameplate designed to hang in a porch. The background shape, of course, is optional. On this type of



A weatherproof changeable menu sign

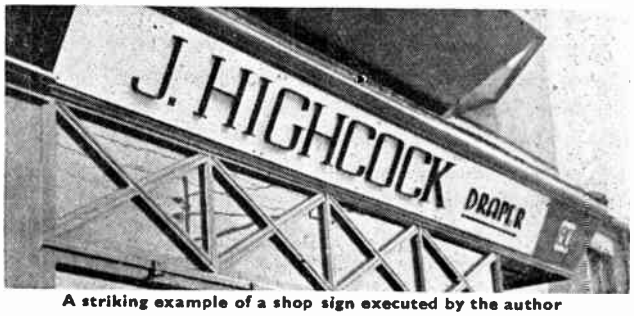
sign the letters are built separately from straight lengths of $\frac{1}{8}$in. thick material either $\frac{3}{8}$in. or $\frac{1}{2}$in. wide.

No curves are introduced and the letters are fixed to the background edge down, thus giving an attractive raised effect especially when viewed obliquely.

Preparing the Strips

Perspex is obtained in convenient areas and strips for letters can easily be cut from a piece 1ft. square. The material is protected on both surfaces with white paper which peels off. On this the widths of the strips can be marked off, using fine pencil lines. A medium tooth fretsaw blade is used to cut the strips.

A fretsaw machine is ideal for stripping purposes. By this method, using a straight-edge guide (hardwood 8ins. by 1in. by $\frac{1}{2}$in.) clamped ('C' clamps) to the machine table at the required distance from the blade, strips can be run off quickly without any premarking.



A striking example of a shop sign executed by the author

One edge of each strip should be finished and polished. The finishing is easily done on a fine sanding disc, but if no such aid is available, the edges should be tried with a flat Ward-type file and then vigorously finished off with a sanding block.

To polish the edge, commercial Perspex polish can be used in conjunction with cotton wool. An equally good and much cheaper polishing medium is wadding impregnated with metal polish of the Duraglit type. Several vigorous strokes with a small piece are sufficient to impart a mirror-like finish.

Making the Letters

All letters are built up over the top of full-size drawings. Letter styles can be copied from books and a drawing of each letter required is made in pencil on a piece of white paper. As a guide to the location of joints, reference should be made to the accompanying sketches.

The drawing is pinned to a flat board and the various lengths required for each letter can be marked off by holding the strips over the drawings and using a scriber. Separate lengths can be cut by using a hacksaw.

Each letter is assembled over the drawing to ensure accuracy and uniformity. Special Perspex cement is used to join the pieces. A little is required at each joint and none should be allowed to spread to the polished surfaces. This cement 'fuses' the material together and effects a rock-hard union in five minutes. If desired the sharp corners of all letters can be rounded with a file, sanded and re-polished.

Before the letters are fixed to the background the latter should be washed in warm soapy water, rinsed and dried on a fine cotton towel. Incidentally, the thickness of the background depends upon the area required. For small signs up to 2ft. by 1ft., $\frac{1}{8}$in. is suitable. For larger signs $\frac{3}{16}$in. or $\frac{1}{4}$in. Perspex should be used.

Fixing the Letters

To fix the letters to the background, cement is used again. But before any is applied, the letters should be arranged on the background, a wooden straight edge serving to keep the letters level.

When all the letters have been desirably spaced one letter at a time can be fixed by applying a thin film of cement to the unpolished edge. Then gently press the letter to the background. The position of the letters can be marked on the surface of the Perspex with a soft pencil.

To complete the sign the edges of the backplate should be highly polished as previously described, and the fixing holes drilled. An ordinary twist drill dipped in water should be used for drilling.

If the sign is to be fastened to a wooden background (instead of being hung) the fixing holes should be at least twice the diameter of the screws to avoid distortion due to expansion. Chromium cup washers can be used in conjunction with the screws and spacing of the holes should be 12ins.

For signs up to about 12ins. square, $\frac{1}{16}$in. thick Perspex may be used to great

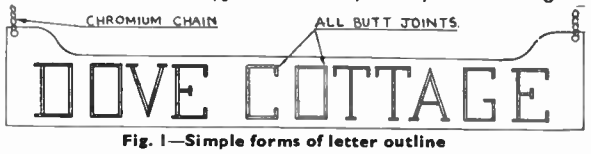


Fig. 1—Simple forms of letter outline

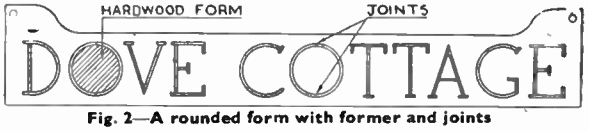


Fig. 2—A rounded form with former and joints

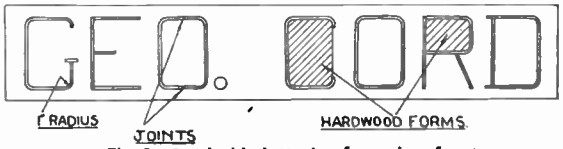


Fig. 3—A suitable lettering for a shop front

effect for the letters. Here it is a good idea to employ chloroform to fix the letters to the background. With this method perfectly sharp lines result at the junction of the letters and the background since there is no surplus cement to 'bubble' on edges and in corners.

Chloroform is poured into a shallow tin, sufficient to take the largest letter, with the bottom only just covered. One letter at a time is placed in the tin for about 15 seconds and then removed immediately and held in place on the background. In less than a minute the letter will be rigid.

Curved Letters

Though the signs described are most effective, those employing curved letters have an added attraction. There are many styles of letters with curves and those shown in Figs. 2 and 3 are just two that lend themselves easily to sign work. Those in Fig. 3 are recommended for shop nameplates.

The methods used in their production can be applied to many other letter types. First of all strips of Perspex are prepared as previously described. These are heated and wrapped round hard wood formers made from $\frac{3}{4}$in. thick timber.

It will be found that in most signs, perhaps, two or at the most three such formers will be required. For instance, in Fig. 2 only one is required. The 'D', 'C' and 'G' can all be shaped from the 'O' form. The edges of all formers must be smooth. Though not essential it is preferable to screw the forms to a flat bench or large base.

Heating

The strips of Perspex are heated either by laying them on a thin metal plate which in turn is placed over a low burning gas jet or by suspending them vertically in an oven by means of spring clips. The amount of heat required will be found by experiment, but at the correct temperature the Perspex takes about a minute to become quite pliable. Indeed it is a simple matter to tie an ordinary knot on a piece 1ft. long $\frac{3}{4}$in. by $\frac{1}{4}$in.!

Using an old pair of gloves the strips are removed and quickly and firmly wrapped and held tightly round the forms. When cool the resulting shape will not show the slightest sign of springing back. Any excess can then be cut away to get a true shape. All letters are assembled and fitted as in the first instance.

One other type of sign which should appeal to those with artistic ability is that which embodies letters cut to any style (including script) from $\frac{1}{8}$in. thick sheet Perspex. Such things as crests, flowers or other appropriate trimming can also be included.

The drawing is done directly on the protective paper and then cut out in the usual way, filed, sanded and polished. The layout and background shapes are unlimited.

General Notes

Small signs with letters assembled vertically (on their bases) on a thin horizontal base are most effective. Painting with coloured plastic solution on Perspex is laborious but outstanding. It is a good idea when cutting strips on a fretmachine to replace the orthodox blade with one from a small hacksaw.

Signs for butchers, snack bars, cafes, as well as menu frames are all in demand. Colour effect is to be studied. Red on white is popular for snack bars, especially if mounted in a frame with strip lighting behind. Brick red on salmon pink is for butchers; pale green on black or flesh on maroon for houses.

Get a bright attractive colour which will not clash with existing colouring.

An interesting piece of landscape modelling is this

VILLAGE IN MINIATURE

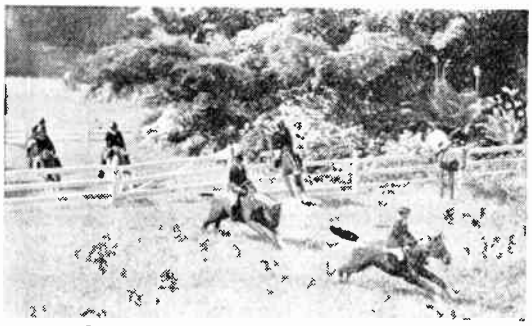
ALL model makers would be interested in the model village of Bekonscot, at Beaconsfield in Buckinghamshire. This is model making on the grand scale, but there is nothing beyond the skill of the home model maker, who could get many ideas both as to subject and execution.

Bekonscot is an entire village or rather town laid out in charming country surroundings, and complete down to the smallest detail. There is a small charge for admission, and all profits go to charity.

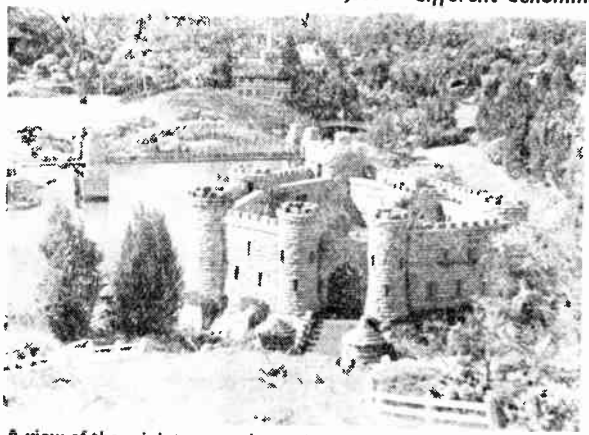
Complete with Railway

The 'town', which covers 3,000 square yards is served by a miniature railway. This has a terminus and eight stations. The rolling stock is of the latest type, signalling is electric, and the whole, on a tiny scale, is an exact replica of an up-to-date railway system.

Bekonscot is dominated by its Minster, a fine building in Early English style, with stained glass windows. There are several churches and chapels of different denominations.



A realistic 'hunt' in progress in miniature



A view of the miniature castle and houses which average 18ins. high

The High Street is lined by half-timbered houses and shops, of an average height of $2\frac{1}{2}$ft. to 3ft. The business part of the town has several hotels, inns, road houses and restaurants, besides a club for the men. It is evidently busy, as there are traffic lights at the cross roads.

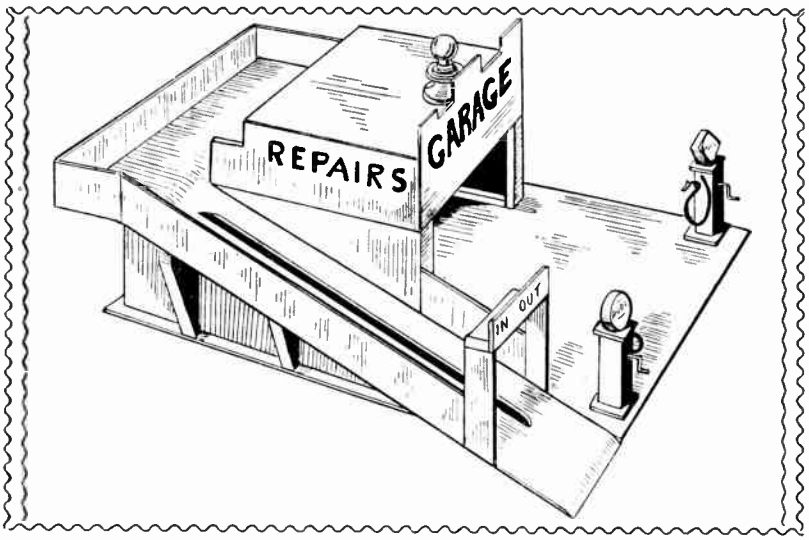
Bekonscot has extensive docks, with a considerable amount of shipping, and also has its own airport. On the outskirts of the town stands the castle, which is a very fine piece of modelling, as you see by the picture. It has a moat and drawbridge and nearby is one of Bekonscot's three windmills. Not far off is the village green, with a game of cricket in progress. There is also a racecourse, and our picture shows the realism of the jumps.

In the suburbs are zoological gardens, and many pretty villas, whilst in the surrounding country are little farms, well stocked with animals.

Few home modellers could undertake so extensive a piece of work, individually, but there is much here that can give many excellent ideas to be carried out, perhaps, on a smaller scale, or by means of the combined effort of a club or group of interested workers and craftsmen.

From these diagrams and instructions you can easily

BUILD A TOY GARAGE



THERE are, of course, many ways of making a Model Garage. One can go to a lot of trouble and expense and make an elaborate affair fitted with every accessory. That type of garage is a model first, and a toy second. The garage described in this article is a simple toy to be played with and is suitable for boys between the ages of four and nine.

The main feature of the toy is the ramp for running cars to the first floor. This is an addition that appeals to most boys, especially those who have seen or heard about the multiple storied parking garages at Olympia and Blackpool, which each holds well over a thousand cars.

This toy garage is large enough to accommodate a considerable number of the smaller type of model cars which are so popular. Doors were fitted to the prototype, but these seemed more of a nuisance than anything, as no child likes opening and closing doors. The roof light is optional, it certainly does make the toy more interesting and some children love anything that lights up.

A Note on Painting

When all the pieces have been cut to size, they should be smoothed and given a coat of flat grey priming paint. The parts should then be temporarily fitted together to ensure that everything is correct, then dismantled and given a coat of colour ready for final assembling. The colours should be bright either in hard gloss paint or enamel. A recommended scheme is as follows:—inside walls and roof, cream; floors, bright green; outside walls and roof, post office red; the 2in. rails, cream; also the petrol pumps and the frontpiece; the lettering, red.

A second coat of colour should be given to all the prominent faces after the toy has been assembled. This note on painting is given first in order to emphasize the necessity of getting the preliminary coats on before assembling.

The Garage Body

The two sides of the garage are made from plywood or compressed board tacked with panel pins to a frame of ½in. square timber, such as is found edging teaboxes. A smear of glue between the faces will make the job more firm. In nailing the frames together, if the points of the nails are removed before driving in, splitting will be avoided.

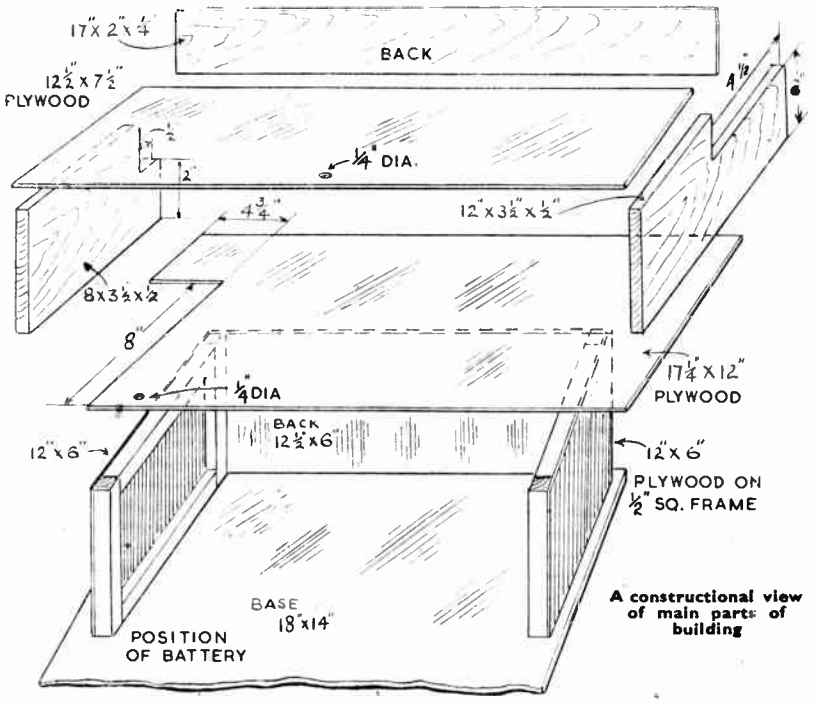
The back wall and the baseboard can be cut from plywood or compressed board and after the back has been fitted, the two frames (with the sides fitted) can be screwed to the baseboard from underneath, using two ½in. screws in each side. Ensure that the sides are spaced perfectly square. Cut the first floor from plywood or board, this being 17ins. by 12ins., with a piece 8ins. by 4¾ins. Cut out for the ramp and a hole drilled in the front centre for the light wires. Cut the two first floor sides, 8ins. by 3½ins. and 12ins. by 3½ins. and screw these to the first floor. Fit the first floor and make secure with a smear of glue and panel pins.

The Roof

The roof is fitted next, this being secured with glue and panel pins. The roof should be complete with lamp tower, the latter being made from an old bobbin, to which two grooves have been filed in the top face to accommodate the wires. The tower is fixed with two screws. It is advisable to thread the light wires (twin flex) through the various holes before the roof is fixed. The frontpiece can now be fitted, thus completing the body of the garage.

Making the Ramp

Cut the ramp from a piece of plywood or board and chamfer the lower end to give a smooth run in for the cars. Nail in



A constructional view of main parts of building

position the centre strip of ¼in. square. This should be chamfered at each end. Cut the two ramp supports from any suitable timber, preferably ½in. thick, and nail a strip across the top of each to take the ramp fixing screws.

Place the ramp and top support in position and mark on the side of the garage the position of the support. Drill two screw holes through the side of the garage and fix the support with screws driven in from inside.

Rigid Fixing

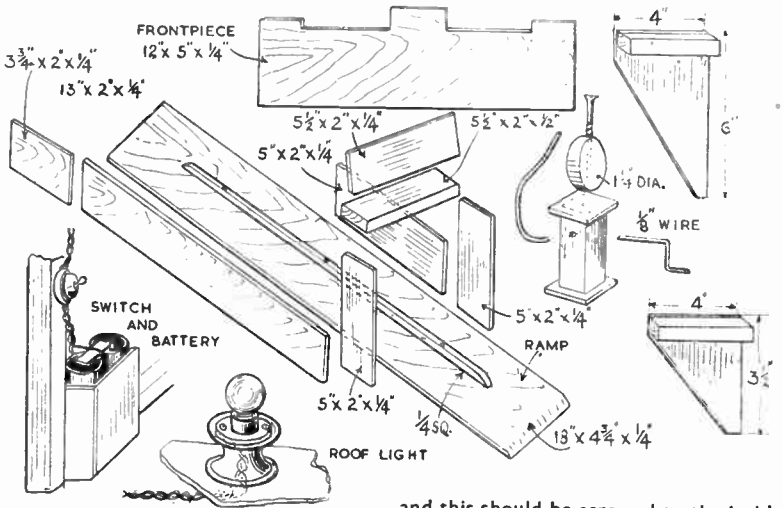
To make more rigid, drive a screw through the baseboard into the bottom of the support. With the ramp in position, fit the other support in a similar manner. File the top end of the ramp to make a good fit up to the first floor, and temporarily fix in position.

Fit the sides of the ramp, after they have been sawn at each end to make them at right angles to the baseboard. Glue and fix in position, starting with the 3¾in. piece which fits at the top. It should be ensured that the 4in. piece which fits up to the garage comes the same distance down the ramp as the other side. Fit the gateway next, trimming the ends of the pieces to bring the structure perfectly square and to fit snugly to the sides of the ramp. The ramp can now be finally fixed to its supports, using four ½in. screws.

Petrol Pumps and Light

The pumps are made from 1in. square soft wood, 3ins. long, with a 1½ins. square of plywood fixed to each end. A plain wooden wheel 1½ins. diameter and ½in. thick is drilled right through the edge and screwed to the top, or a piece of 1½ins. square can be drilled across the diagonal and used in the same way. The pump handles are made from ⅛in. wire, bent as shown. The end which passes through the pump is bent over to prevent the handle coming out.

The petrol tube is made from valve rubber, each piece 4ins. long. To the free end of each tube, is fitted a shoe lace tag, or anything similar will do. The tube is fixed by first drilling the pumps ½in. deep, pushing in the tube, and securing with a panel pin. The pumps are secured to the baseboard with a dab of glue and a screw inserted from underneath.

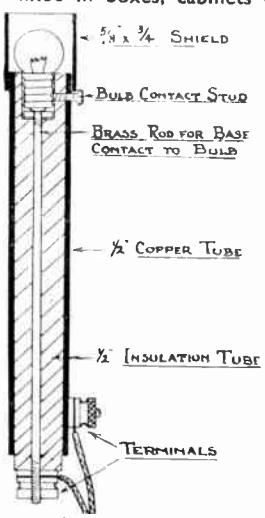


A bulb holder, suitable for an ordinary flashlamp bulb will be needed. Fit this to the top of the light tower after first pressing the two wires into the filed slots. Ensure that the terminals are adjacent to the wires. It should be ascertained that the wires are long enough to reach the battery and the switch before fixing the holder. The compartment for the twin-cell cycle battery should be wide enough just to grip the battery. This spacing may call for a strip of wood to be fixed to the garage frame before the plywood pieces are fitted.

Any type of miniature switch will do and this should be screwed to the inside of the garage frame after the wires have been connected. One wire should run from the light to the switch and the other from the light to the battery. A short piece of wire is then taken from the second terminal on the switch to the battery. The wires can be fastened to the battery with paper clips. The light is made more attractive by dipping the bulb in red cellulose enamel.

BATTERY OPERATED INSPECTION LAMP

THE value of a pen torch when examining small electrical equipment, instruments, etc., is well-known, especially if the equipment is fixed in boxes, cabinets or behind car panels. These torches, however, have two big drawbacks. The switch has to be held in position, leaving only one hand free for work, and the life of the battery is short when the torch is used continuously.



Both these difficulties are eliminated by making a lamp as shown in the diagram, and connecting it to a battery of sufficient capacity to meet requirements. The body of the lamp consists of a 4in. length of light gauge copper tube of ½in. diameter. Into this tube is forced a ½in. diameter wireless lead-in tube, so the insulation is level with the end of the body tube at one end, and protrudes about ⅛in. at the other end. A tight fit is essential.

Contacts

The brass rod of the insulating tube is then removed, and the top end of tube drilled ⅜in. to a depth of ½in. to house the base of a screw-in type bulb. To lock the bulb in position select a small screw about ⅛in. diameter by ½in. long, and drill and tap the body to suit, as shown. This screw will form a contact between the bulb and the copper body.

The second contact is formed by the brass rod of the lead-in tube. Having removed one terminal, reduce the outside diameter of the back nut to just under ⅜in., and push rod and nut down the insulating tube, so the back nut rests at the base of the ⅜in. hole, to form contact with the base of the bulb.

A spot of solder on the nut will fix it to the rod permanently. Run on the other back nut in order to clamp the rod to the insulating tube and refix terminal nut. It may be necessary to extend the thread on the brass rod, and then cut off the surplus.

At the bottom of the lamp fix a second terminal. This can best be done by drilling and tapping in the body of the lamp a hole, to take the screwed rod of a small terminal, such as used on some types of 4½-volt bell batteries. Care must be taken that this terminal stud does not make contact with the brass centre rod. Screw on a back nut and solder in position, and finally run on terminal nut.

Protector Shield

A push-on shield to protect the bulb can be made from a piece of light tube, ⅝in. diameter and about ¾in. long. Or a piece of rubber tube can be used if preferred.

To use the lamp, a screw-in type bulb is fitted and the terminals connected to a suitable supply by a twin flex. A 4-volt flash lamp bulb and battery are quite satisfactory.

Simple inexpensive to make is this dual-purpose

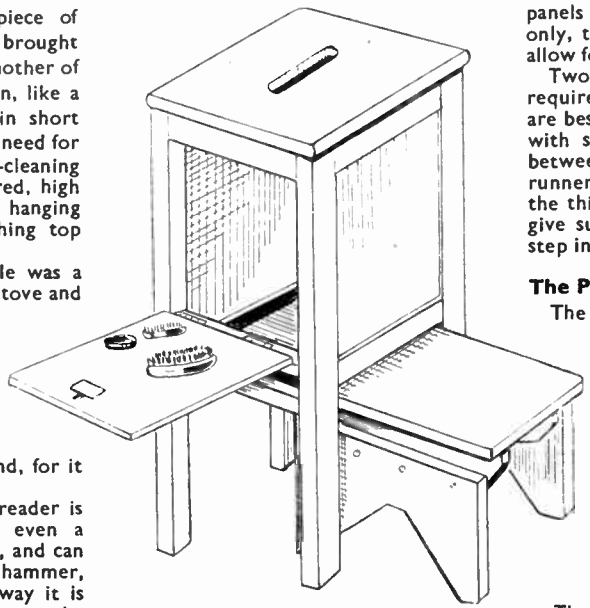
USEFUL KITCHEN STOOL

THE idea of this useful piece of kitchen furniture was brought about by necessity—'the mother of invention'. Space in the kitchen, like a number of other things, was in short supply, and there was an urgent need for somewhere to keep the shoe-cleaning tackle. Also a stool was required, high enough for window cleaning, hanging out the clothes line and reaching top shelves.

Now, the only space available was a small gap between the cooking stove and the boiling copper, about 12ins. wide. After a few evenings in the workshop, the stool-cum-shoeblack box shown in Figs. 1 and 2, was the result. The stool was made several years ago, and to lose it now would be like losing an old friend, for it is in demand every day.

It matters not whether the reader is a baker, engineer, clerk, or even a woman, if he or she has a mind, and can use a screwdriver, saw and hammer, this stool can be made. The way it is made will, of course, depend upon the skill of the maker and the materials and tools at hand.

It can be simply nailed together from scrap pieces of wood or it can be made into a beautiful piece of furniture. Whichever way it is made, it will prove, providing it is safe, a most useful item to have around.



The Framework

The material from which the framework is made, can be of any convenient size. The legs for the stool illustrated were of 2ins. by 1in. and 21ins. long. The cross rails were 1½ins. by 1in., except for the two runners for the step, which were 1in. square. The method of making the joints is left to the reader. A mortice and tenon joint will make a good job, also will pegging and gluing, or the top rails can be lap jointed as shown.

Whichever way the rails are fixed, the two on the door side should be set back to allow for the door thickness. If the rails are to be rabbeted to take the side panels, they should be jointed to come flush with the outside of the legs. If the panels are to be fixed with panel pins only, then the rails should be set in to allow for the thickness of the panels.

Two lengths of 1in. by 1in. will be required for the step runners. These are best let into the legs a ¼in. and fixed with screws, as shown. The distance between the bottom rails and the runners should be about ¼in. more than the thickness of the step top. This will give sufficient freedom for drawing the step in and out.

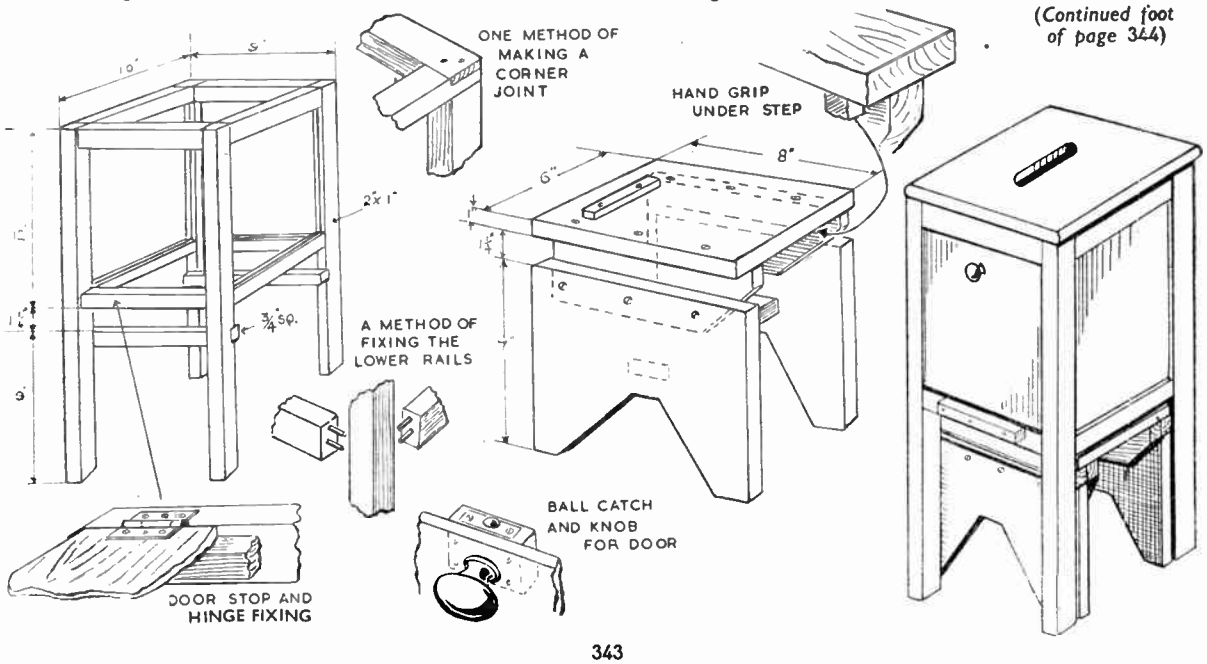
The Panels and Door

The panels can be cut from any suitable material such as compressed board or plywood. If the frame has been rabbeted, the panels will have to be fitted as the frame is assembled. It is best to cut the panels individually to suit each side, this will allow for any variance in the measurements. The bottom can be cut ready to drop inside the frame, but it should not be put in position until after a step stop has been fitted as described later.

The door can be made of pressed board, plywood, or ¾in. planed wood. The hinges are fitted as shown, and any suitable kind of catch will do. A ball catch is shown in the sketch. An ordinary cabinet knob will serve to open and close the door. A piece of ¾in. square is screwed to the bottom rail below the door to allow it to lie flat when open and so form a platform for the shoe-cleaning tackle.

The top can be cut from a piece of 1in. or ¾in. board, 10½ins. by 9½ins. It should not overhang the side more than

(Continued foot of page 344)



Some interesting and mysterious tricks simply produced by HOME CHEMISTRY

THOSE fascinating indoor fireworks called Pharoah's Serpents are surprisingly easy to make. Or, rather, the serpents' eggs are! The materials needed are ferric chloride, mercuric nitrate, potassium thiocyanate, potassium nitrate (saltpetre) and a little gum arabic or other mucilage.

Serpents' Eggs

First of all dissolve as much as possible of the mercuric nitrate in an egg-cup full of water. Then add one or two drops of your ferric chloride solution. Now make as strong a solution as possible of the potassium thiocyanate in water and add it drop by drop to your other solution until the latter turns red.

A grey precipitate of mercuric thiocyanate will have formed and this is the stuff the eggs are made of. Let it stand

Fig. 1—The magic finger

for half an hour. Filter it off, wash it on the paper with water and then let it dry. Do not try to dry it artificially or you may spoil it.

Chemical Magic

All you have to do to make Pharoah's Serpent eggs is to moisten the dry precipitate with a little water containing some saltpetre (to help them burn) and a little mucilage to hold everything together. Divide the dough-like mass into pieces and gently mould them into cones. Again, allow them to dry on their own and they are ready for the party!

Now, perhaps, one or two bits of chemical magic would come in well at the party, too. What about the writing finger? For this trick you take a sheet of coarse-grained paper and divide it into three imaginary parts. Into the top part you rub a dry mixture of equal parts of tannic acid and ferric ammonium sulphate. The middle portion you treat in the same way but with sodium ferrocyanide and ammonium sulphate. Lastly, you rub the lower portion of the paper with a mixture of sodium salicylate and ferric ammonium sulphate.

Now, when you dip your finger in water you can write in black at the top, blue in the middle and red at the bottom. The water allows the pairs of chemicals to react and coloured compounds are produced.

Beer and Water

Another useful trick needs a bottle with a screw-cap lid holding a cork, a few drops of tincture of iodine and some crystals of ordinary photographic 'hypo' (sodium thiosulphate).

Three-quarter fill the bottle with water and add some iodine, shaking until a nice pale brown colour is produced. Now cut a small hole in the centre of the

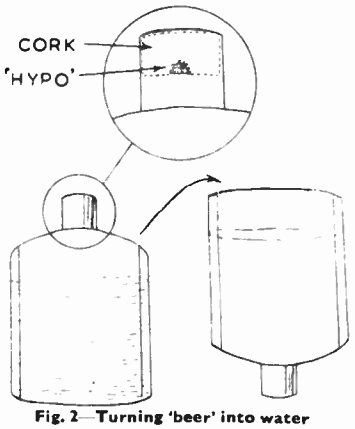


Fig. 2—Turning 'beer' into water

underside of the cork and press one or two crystals or 'hypo' into it. Carefully screw the cap on again.

When you invert the bottle and give it a shake the 'beer' will become water because iodine and 'hypo' react to give sodium iodide, which is colourless.

A Mystic Change

Now by taking a little more trouble you can do a trick which is even more mystifying than those above. The audience see you bring in a glass of 'water' and you tell them you are going to turn it into ink. Then you suddenly clap your hands and the liquid becomes instantly dark blue. And you have not been near it!

To prepare for the trick, boil 2 grams of starch with about 100 ccs. of water and filter. Then make a solution of 0·2 gram (a pinch) of sodium sulphite in 50 ccs. of water containing 1 cc. of dilute sulphuric acid. Mix this solution with the starch and add enough water to make it 225 ccs. Label it A.

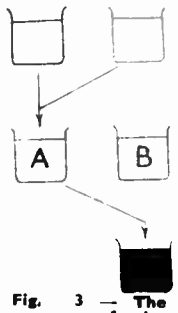


Fig. 3 — The sequence of mixing in performing the ink-and-water trick

Now dissolve ½ gram of potassium iodate in a little warm water and then add more water until you have 225 ccs. Label this B.

The Time Interval

Take small equal portions of A and B and mix them. Nothing happens at first and then suddenly the blue colour appears. What you have to do to make the trick effective is to time the change accurately, so that you know just how long to talk to the audience before clapping your hands. This timing must be repeated several times before you can be sure of the result. And always use roughly the same amount in your tests and when doing it before an audience.

What these latter people do not know is that in an acid solution sodium sulphite liberates iodine from any iodate, but only after a time lag. It is this iodine that acts on the starch causing a blue colour. The trick is one quite baffling unless you happen to know the simple answer.

Kitchen Stool—(*Continued from page 343*)

¼in., otherwise it will be unsafe to stand on. A hand slot 3ins. by ¾in. should be cut in the centre and nicely rounded on the sides for comfort. The top can then be screwed in position, and a piece of lino tacked on to improve the appearance, especially if the wood is of poor quality.

The Step

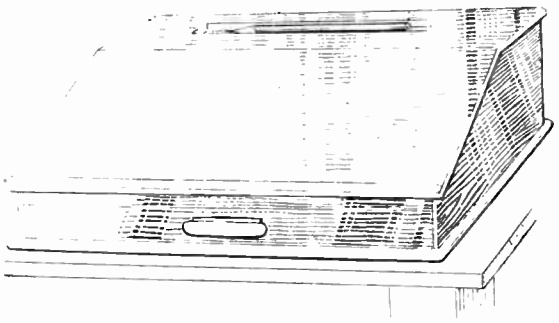
The step is very useful when cleaning the windows or hanging out the clothes. It also makes the stool more steady in use. The step is made of 1in. planed wood and the dimensions are given on the sketch. The step legs are supported in the middle with a cross piece of 2in. by 1in., either tenoned and glued, or just screwed in position. The top is supported on bearers which are screwed to the legs leaving a slot 1¼ins. wide to fit the runners.

A small strip of wood is screwed under the front of the step to form a hand grip. After the step has been slipped in position in the frame, a strip of wood should be screwed to the top of the step to prevent it being pulled right out or pushed too far in. When this strip has been fixed in the right position, the bottom of the shoeblack box can be placed in position and secured with panel pins.

All that remains is the finishing. After a good rub down with glasspaper, the stool should be given a coat of flat grey undercoat paint, followed by two coats of enamel in colours to match the surroundings.

The student at home or school should make this

SMALL WRITING DESK



HAS it ever occurred to you to make a table school desk for your boy? From the age of seven or eight, especially if he has homework to do, he needs a little desk in which he can keep exercise books, pencils, pens and other school sundries. It would not only please him, but would teach him the tidy habit of putting things away when he has finished work.

It would also be a useful addition to the home of the small business man, providing a place where a few letters, bills, etc., could be kept together handy. So far as size and interior arrangements are concerned it can be made to suit personal tastes and requirements.

Fig. 1 suggests what is in mind. Here you have a light desk measuring 18ins. by 13ins. and about 6ins. high. The writing front lifts up, disclosing a shallow well, whilst below is a useful drawer which can be partitioned if required. Alternatively, the drawer could be omitted, making the well correspondingly deeper. In any case provision could be made in the well for ink bottle, eraser, etc., by making a small box to fit into one corner.

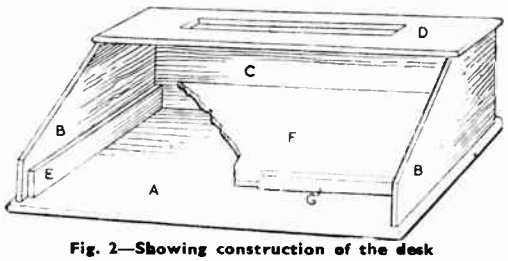


Fig. 2—Showing construction of the desk

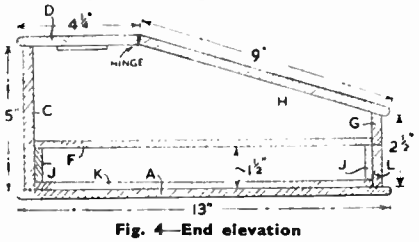


Fig. 4—End elevation

The measurements given can be modified to suit personal requirements, but for the purpose of explanatory details we will assume that they are being followed.

General Construction

A glance at Fig. 2 will show that the desk is glued and nailed or screwed to the base (A) which measures 18ins. by 13ins. by ¾in. It is not essential to have this in one piece. It can be made up of two or more pieces butted and glued together. The sides when screwed in place will strengthen them sufficiently.

A detail of a side (B) is shown in Fig. 3. Two of these are required and they are cut from ¾in. wood. The back (C) is glued between the sides and measures 16¾ins. by 5ins. by ⅜in. Piece (D) will be 18ins. by 4½ins. by ⅜in. The back and side edges will be rounded and the front edge chamfered to take the lid as shown in Fig. 4. A piece about 8ins. by 1in. can be cut from the centre to form a depression for the pencils and pens.

A backing piece of ¼in. or ⅛in. wood must be glued underneath. Two side rails to take the floor of the well are next glued to the sides (B), in the position shown in Fig. 2. These rails (E) measure 11¾ins. by 1½ins. by ½in. The front rail (G) measures 15¾ins. by 1½ins. by ⅜in. and must be chamfered as shown in Fig. 4.

The floor of the well is of ¼in. material and can be of plywood or composition board or stout cardboard. It will measure 16¾ins. by 11¾ins. and can be dropped into place without fixing.

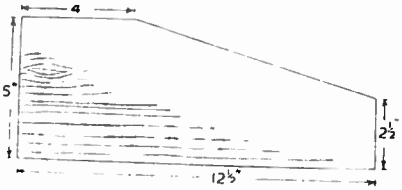


Fig. 3—Shape and dimensions of the ends

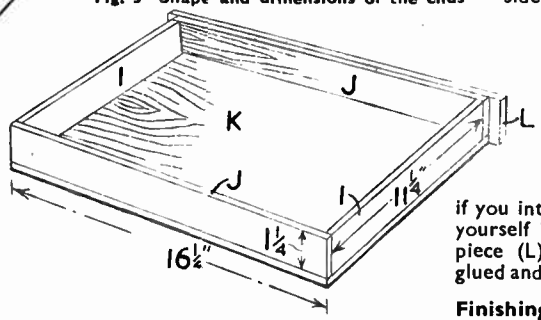


Fig. 5—How the drawer is made

The Lid

The length of the lid (H) will be 18ins., the same as the top, piece (D). It will be of ⅜in. stuff and will measure 9ins. wide. Here again it can be made from two pieces and held together by battens underneath. In any case two light battens will help to prevent warping.

The position of the hinge is shown in Fig. 4. and although outside flap hinges are easier to fix, it will look better if butt hinges are used. These should be recessed slightly into piece (D) and the lid to allow for the thickness of the hinge.

The Drawer

The drawer is first made up as a shallow box of ¼in. material and to the measurements shown in Fig. 5. The short sides (I) are glued and pinned, with light fretpins, between the longer pieces (J). The floor (K) can be of plywood or composition board ¼in. thick. It will measure 16¼ins. by 11¾ins. It could also be constructed from two or three narrow boards to make up the total 11¾ins., so long as they are securely pinned to the sides.

It will be noticed that an extra piece (L) is fixed to the front of the drawer. It projects ¼in. at each end and thus measures 16¾ins. by 1½ins. It will be seen by comparing the sketches in Fig. 1 and Fig. 2 that piece (L) comes up flush with the side rails (E) when the drawer is pushed home.

The drawer handle is a matter of personal choice. It can be of brass or wood bought ready made, or it can be shaped from an odd piece of ¾in. or 1in. wood. Remember that if you intend to fashion the handle yourself it must be screwed to piece (L) before (L) is in turn glued and pinned to (J).

Finishing

The type of finish depends largely upon the material used in construction. If the wood is all of the same variety it would look well if treated with brush polish and varnish. Fill the grain first with a good wood-filler and then apply two coats of brush polish.

Allow to dry for about half-an-hour and then glasspaper with a fine grade paper until the surface is quite smooth.

Two more coats of polish and a final light glasspapering will prepare it for the varnish which should be clear, not varnish stain. The brush polish will colour the wood slightly and will take the varnish well. Two coats will be

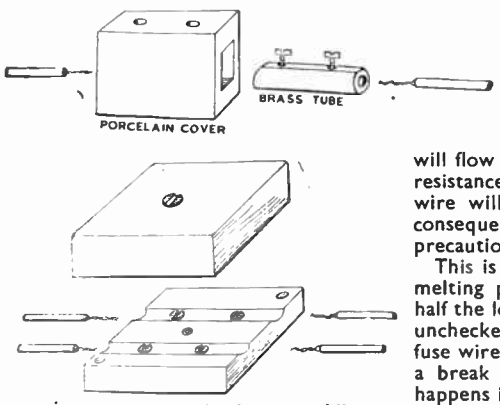
(Continued foot of page 346)

Safety first is a sound maxim when dealing with ELECTRICAL CIRCUITS

IT cannot be too strongly emphasised that electricity is dangerous unless properly used. Yet many homes have extra lights plugged into existing points, the wireless working from a light socket with flex trailing clothes line fashion, or electric kettles and irons connected to unearthed circuits.

These things can cause fires or shocks which may prove fatal. The correcting of such faults, installing plugs and sockets in a professional manner and the earthing of domestic utensils are all within the scope of the handyman.

The essential things, so far as electricity is concerned, are safety precautions, careful work and a grasp of what constitutes an electrical circuit. If these things are learned and practised there will never be need of an electrician in the house and electricity will, indeed, be your servant.



Two typical junction box assemblies

It is one of the world's queer facts that no one has quite defined electricity. A few reasonable theories have been advanced, but all that has been established is that it is energy of some kind. Yet science has so harnessed it that it is almost an indispensable part of our daily lives.

Electricity can be likened to water in a pipe except that it flows through wire. To be useful it must flow through some form of resistance which can be a light bulb, a heater or a motor. It always flows from positive to negative and as it flows it gives off a heat proportionate to the resistance in the wires.

As the flow of water in one pipe will speed up if forced through a thinner pipe, so with electricity. The cable carrying current from the mains is comparatively thick and offers little resistance; the heat generated is tiny. But when the same current is pushed through the filament of a bulb, wire no thicker than a human hair, the heat generated is high. Sufficient, in fact, to cause the filament to glow with a white heat and so give light. The thicker wire in electric fires offers less resistance, length for length, and only glows red hot.

Short Circuits

If for some reason or other, a resistance is not connected in circuit, that is between positive and negative, there will be what is known as a short circuit. The electricity will flow so fast along its wire, with no resistance to slow it down, that the wire will become hot and burn. The consequences might be fire, but a safety precaution in the shape of a fuse is fitted.

This is usually of tin wire with a low melting point, designed to carry about half the load of the other cables. As the unchecked current rushes around, these fuse wires become hot and melt, causing a break in the circuit. Actually this happens in a fraction of a second and all we see is a flash in the fuse box.

Electricity will flow through the human body and if a connection between positive and negative is made, say, by holding two wires or pushing a finger into a live lamp-holder, a circuit is made and a shock will be felt. Such shocks vary according to the size of the resistance in circuit. The greater the resistance the more current being used and the bigger the shock.

Another feature of electricity is that it is always eager to escape down to earth. If it can do this through your body the resulting shock will be a heavy one. This can happen when handling fittings and standing on a stone floor.

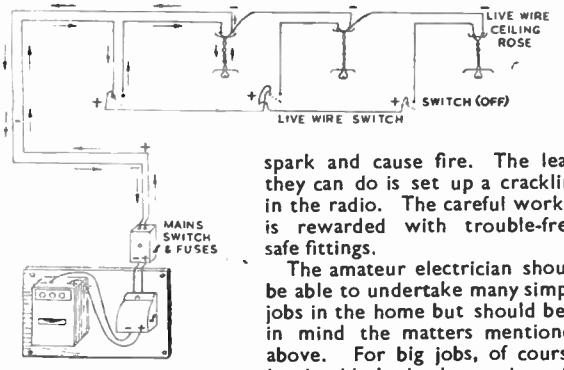
The golden rule, therefore, when handling circuits is to switch off before touching anything. And this means switching off at the main switch, usually by the meters. The circuit diagram will show that only the mains switch will break both positive and negative lines. All other switches break the positive line only and one point of each switch and one point of each lamp-holder is alive even when switched off, unless the mains are off.

Just in case the main switch is overlooked, always stand on a wooden board if the floor is of stone. Never climb on the sink or bath even to fit a bulb. When standing on a ladder or chair do not support yourself with one hand on the wall. These precautions break the body contact with the earth and prevent shocks.

Joins in electric cable should be avoided whenever possible, for an inefficient joint may pull apart and cause fire. For, as the cable parts under strain, the current will jump across the gap like a miniature flash of lightning. If a join is the only way out, the cables should be connected with junction boxes.

Insulation should not be cut away too far when making connections. It should be intact right up to the terminal screw and all the strands of multi-cored flex must be firmly twisted together. Loose ends cause shocks and short circuits.

Tighten all screws, for loose joints may spark and cause fire. The least they can do is set up a crackling in the radio. The careful worker is rewarded with trouble-free, safe fittings.



A house lighting circuit

The amateur electrician should be able to undertake many simple jobs in the home but should bear in mind the matters mentioned above. For big jobs, of course, he should obtain the services of a qualified electrician.

Writing Desk—(*Continued from page 345*)

sufficient, except, perhaps, where the end grain shows.

It would be advisable to give several light coats to all portions of end grain before applying the final coat to the whole. If a well wearing finish is to be obtained you must allow plenty of time for drying thoroughly between coats.

It is not absolutely necessary to varnish the interior, but if the desk is for a schoolboy, it would be advisable because it would keep much cleaner. Plain unvarnished wood will show grubby finger marks very easily. Be careful not to put any varnish where it will interfere with the smooth working of the drawer.

Using Paint

If odd wood of different varieties has been used it will be necessary to resort to painting or enamelling. A fairly light brown or a pale green will do admirably. Here again it requires a good deal of patience in rubbing down with fine glasspaper before a really good finish can be obtained.

Finally, obtain a piece of green baize or similar soft material and glue this under the whole base, or small squares could be glued on at the corners. The desk can thus be used on a polished table without fear of scratching.

Cutting and colouring wood for decoration is known as INTARSIA WORK

INTARSIA work is a method of decorating woodware, and consists of cutting a suitable design on the face of the work, and colouring the parts of the design separately to resemble marquetry or inlay. It is extremely simple to do, effective to a remarkable degree and costs very little for materials and equipment.

Intarsia decoration can be successfully applied to any kind of wood, but the best results are obtained when the work is carried out on fine-grained woods. Three-ply is very suitable. The only tool required is a cutting tool. A stencil knife is ideal, or a simple knife can be made by fitting the small blade of a broken penknife into a wood handle. The point of the knife should be razor-sharp.

Colouring Agents

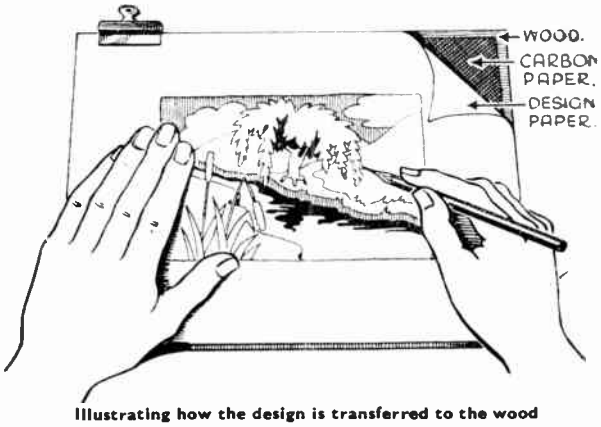
Wood stains are suitable for colouring the design, but their colour range is somewhat limited. Leather dyes and stains can be used for this work and offer a wider range of colour selection. The only other things required are some glasspaper, carbon paper and suitable designs.

Practically any design with moderately large sections is suitable for intarsia work; intricate designs with very small pattern sections are not entirely suitable. Names, monograms, initials and conventional designs are suitable, as also are simple pictures such as landscapes. The beginner is advised to select very simple designs for first attempts at intarsia work, and to practise on odd scraps of wood to acquire skill and gain confidence.

Preparation

The first step is to prepare the wood by rubbing it smooth with suitable grades of glasspaper. The position of the decoration should be lightly pencilled on the wood. In the case of a central decoration (say, on the top of a box lid), it will be found helpful to draw diagonal lines from corner to corner to find the centre.

The design itself should be drawn or traced on paper, and when correctly positioned on, the work can be held in place with bulldog paper clips, as illustrated in the drawing. A sheet of carbon paper should be slipped under the design paper with the coated side of the carbon paper face down on the work. A well-sharpened pencil should be used to transfer the design to the wood. Examine the work before removing the design paper to ensure that every part of the design has been transferred.



Illustrating how the design is transferred to the wood

Cutting into the Wood

When transferring has been completed, the lines of the design can be cut into the wood with the knife. Use the knife as you would a pencil and keep the blade vertical. Cut the lines an even depth so far as that is possible and hold the knife firmly. Do not allow the point of the knife to wander with the grain. Provide firm wrist support to prevent the knife slipping. If the design is detailed it will be found best to commence in the centre and work outwards.

After cutting the lines, cleanly and evenly, the work should again be rubbed smooth with glasspaper. After cleaning the work, blow the dust away and clean the dust out of the cuts with a fine brush. The decoration is now ready for colouring.

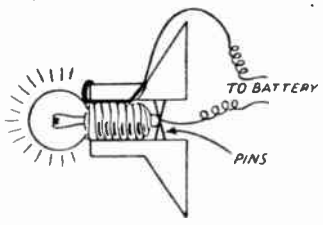
The colouring agent (wood or leather dyes or stains) should be applied with a soft brush; care must be taken not to allow the colour of one section to run into the next section. Use the colouring agent sparingly, commencing from the centre of the decoration and working outwards. A few drops of ammonia in the stain or dye will be found very effective in preventing colours running into each other. Use your own judgment about colours; if you are colouring a landscape use natural colours for trees, grass and bushes, etc.

Polished Finish

The decoration should be polished to finish. A good wax polish is suitable and the first application should be very generous to fill the cuts. After polishing it will be found very difficult to distinguish between the intarsia work and expert inlay, the only betraying factor being the grain direction. If a very fine-grained wood is used your work will have the appearance of work of greater value in relation to the time expenditure and material cost.

Bulb Holders

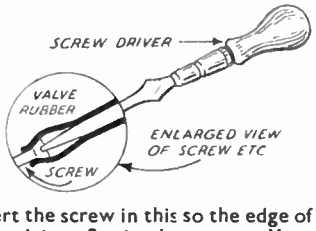
SOMETIMES a small bulb holder will not lend itself to paint, so why not make your own? Cut a cotton reel in



half and enlarge the hole. Drive in two ½in. panel pins crosswise and fix a wire to them. Pass another wire through the side of the reel and up the centre, as in the diagram. Fasten this in the top and take care that the wires do not touch. You can then test, and paint the required colour.

Fixing Small Screws

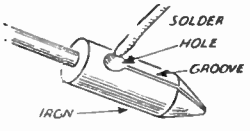
WHEN fixing a small fretwork screw in an awkward position, where it is not possible to hold it with the fingers while it is being screwed, the following method may be used. Take about 1in. of cycle valve rubber, and pull it over the end of a small screwdriver so about ½in. of the rubber projects.



Insert the screw in this so the edge of the screwdriver fits in the screw. You will find this will hold the screw while it is being inserted.

Soldering Tip

THIS tip will prove useful when you find difficulty in making solder run into a seam. Drill a shallow hole in the middle of the iron, and with the edge of a file form a V groove to the tip of the iron. Put the solder in the hole of the hot iron, and it will run down the groove into the seam.



Another suggestion for making a cylindrical form of REVOLVING LAMP

THIS is an item for people who like novelties—a lamp with a shade that revolves slowly. The shade encloses the bulb, cylinder fashion, and bears some interesting scene.

They are quite simple to make, but a certain care must be observed in balancing the parts, as the whole shade revolves on a pin-point bearing set on the top of the bulb. As hot air rising from the bulb is the only driving agent, the more accurate the balance, the better the action will be.

First make the bulb holder and base (Fig. 1). The base is a circular or rectangular piece of wood about 6ins. across and ½in. to ¾in. deep. A hole is bored in the centre, also a channel from this to one side, both to take the flex from a batten lamp-holder which is

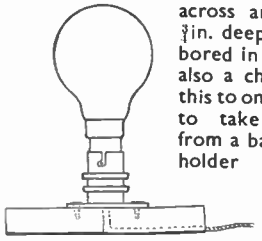


Fig. 1—The base and lamp holder

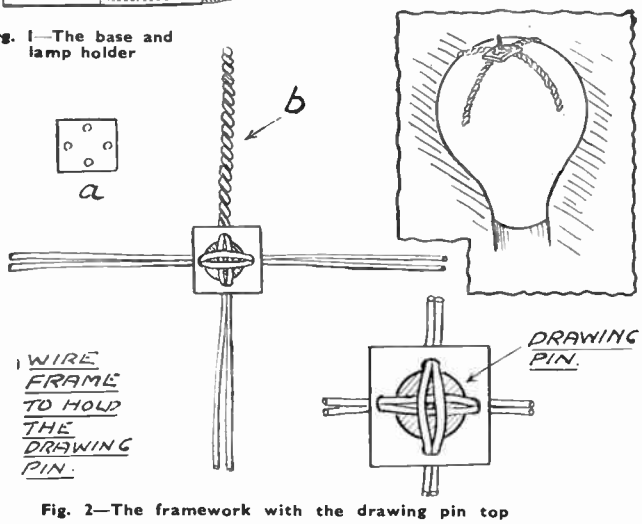


Fig. 2—The framework with the drawing pin top

screwed into position over the centre hole.

Now comes the revolving shade and bearing. The latter is made with four pieces of wire, a small square of tin and a large-sized brass drawing pin. The tin is cut to about ¾in. sides and four holes bored as (a) Fig. 2. These are best made by putting a nail at the desired point and tapping gently; the slight bulge which appears on the further side then being filed away. This leaves good, flat-edged holes. Now thread lengths of wire through as shown, twisting the pairs on all four sides as (b).

The twisted wire must extend down over the bulb (see inset) for about 1½ins., which means that the original length will have to be about 4ins. There is, however, no absolute rule, as long as the frame firmly caps the bulb. Quite soft wire will do, as it gains strength by the twisting. Before putting in the last two wires, insert the drawing pin which should be one of those large headed type.

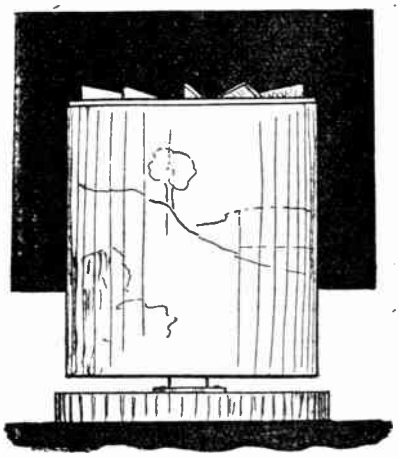
If correctly made, the wires when curved down will hold the tin square with its drawing pin pivot sufficiently firmly on the centre top of the glass. The inset sketch shows the frame in position.

Parchment Cylinder

The shade is built up of the top disc (A) Fig. 3 and the parchment cylinder (B). The disc is a piece of light, easily-cut tin of 6ins. diameter. With a compass scribe out the circles (1), (2) and (3). Cut at intervals between (1) and (2) all round as shown, thus forming tabs which finally can be bent down with a pair of flat-nosed pliers. Drill the holes (D) on opposite side tabs for attaching the parchment.

Between the circles (3) and (4) draw in diameters at right angles and then put in two more diameters bi-secting them. This gives eight radii in all. Along each radius mark a triangle as (E). Then by scoring heavily with something pointed and filing on the other side, cut two sides of each triangle as shown by the heavy line. The flap so formed is then turned up at an angle of 45 degrees along the dotted line, thus forming inclined vanes.

At the very centre of the disc, which will be accurately indicated, as it was the point from which all the circles were drawn, make a small indentation on what will be the underside, again by a tap on a nail, this being to fit over the point of the upturned drawing pin.



The shade itself is a rectangle of parchment of sufficient length to go round the tabs of the disc, which have now been bent down, and of sufficient depth to cover the bulb but ride above the base. For a 6in. disc this will mean 19ins. long leaving a little overlap, and about 6ins. deep.

On the parchment paint some simple continuous scene, using transparent colours, that is, colours that retain their tint when light shines through them. Ordinary colours just look black; transparent colours, however, are sold as such.

Place the shade thus completed on over the bulb, with the pin-point bearing fitting in the centre indentation, switch on, and as everything heats up the shade will start to revolve, the turning continuing as long as the lamp burns.

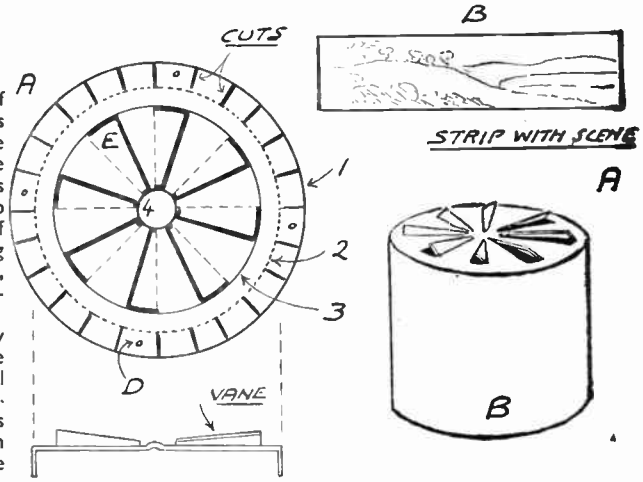


Fig. 3—The rotor, the cylinder and a suggested painted scene

INTERESTING NEW ISSUES

READERS will, no doubt, recall that some time ago Hobbies Weekly spoke about the issue of new Canadian Stamps. Then, just before these were due to be issued, news came through that the stamps which had been prepared were not going to be issued after all and we have had to wait some considerable time for the new ones to arrive.

In Civilians

The illustration this week shows you all five new values and, as you see, the new portraits show His Majesty in civilian clothes instead of—what? How many of you could sit down now and without looking at your album write down the uniform that His Majesty is wearing on the 1c., 2c., 3c., 4c., and 5c. stamps?

As there are two three cents stamps, the colours being different, although the designs are the same, it means that His Majesty appears twice in Naval, twice in Military and twice in Air Force uniform. It is quite easy to remember on which value he appears as a member of each Force. The order is Naval, Military, Air Force for the 1c., 2c., 3c., then Air Force, Military and Naval for the 3c., 4c., and 5c.

'First Day' Cover

As you see the stamps have been stuck on one cover which was posted on the day of issue. In England up to now we have not had these special envelopes for first day celebrations. If we have wanted to send a 'First Day' cover, then we have had to stick the stamps on to any envelope and label it ourselves as a first day cover and then trust that the Post Office clerk will postmark the envelope so that the date is easily visible. Now, however, a London Firm has introduced a printed envelope for the special purpose. Canadian firms have been doing this for some considerable time.

From the Cook Islands

Another nice new set that has just been issued is one that comes from the Cook Islands in the Pacific Ocean. By the way—what a splendid thing it would be for philately if everyone would take out an atlas and look up those places the whereabouts of which are somewhat hazy to them.

There are ten stamps in this new set, all of which are of large size—the same as the Universal Postal Union stamps now issued by this country. The seven low values are horizontal views, the three shilling values are vertical stamps.

At the risk of another aside—do you realise why this question of the size and shape of a stamp is given? Well the reason is so you will be able to arrange a collection more easily. If you obtain one of these stamps then you need to know what the other values are like so that when you place it in the album it will not look silly. Neither will you have to take out the first specimen in order to arrange the second.

Picturesque

The halfpenny stamp shows a picture of Ngatangiia Channel, Rarotonga—a pretty scene of water backed by mountains and flanked by palm trees. This Ngatangiia Channel was the departure point of the Maoris for New Zealand in 1350 A.D. Captain James Cook appears on the left of the one penny stamp with a map of the Hervey Islands in the centre. These were the first of the islands discovered by Capt. Cook in 1773.

The twopenny value shows another portrait, but this time it is that of the Rev. John Williams who was the first missionary in Rarotonga in 1823. In the centre again is a map of Rarotonga and on the left a sailing vessel 'The Messenger of Peace'. The threepenny stamp has a large map of Aitutaki superimposed on what is a view of the island.

Five new values from Canada on a First Day Cover

There is no fourpenny value, but the fivepenny gives us something rather new for designs of such small islands. It shows a view of a plane landing on the aerodrome at Rarotonga. The sixpenny shows us a view of Tongareva or Penrhyn Island; the eightpenny a banana plantation with a large tree bearing a beautiful bunch of this fruit. Notice the size of these leaves.

Now we come to the three higher values. The one shilling has a large figure of Capt. Cook overlooking a map of the part of the Pacific ocean in which we find the Cook Islands. More palm trees and a hut on the two shilling and the three shilling compares a native outrigger canoe with a large ocean going vessel.

Price Panels

One rather clever point in connection with this set is the way in which the value tablets have been drawn. In each case some part of the design contains the value. For instance, the ½d. comes in an angle formed by the frame of the stamp and a primitive club. The 1d., 3d., and 8d. are all drawn in the inside of a fruit, a shell houses the figure 6 and native paddles the 5d. The 1/- has the most ingenious frame in the opinion of the writer. It is a bollard to which is attached the rope that forms the frame of the stamp.

Maps

Map stamps are very fascinating to most collectors and Egypt issued a stamp last August showing a map of the Egyptian Empire under Mohammed Ali. It was a large stamp of low postage value so it should not be dear to buy. It shows a small portrait and a large map of Egypt, the clearest this country has had. Others have simply been parts of the Nile and so on.

Most readers will by now have seen the three South African stamps issued in connection with the monument placed outside Pretoria in memory of the Voortrekkers, or at least seen one of them. The 1d. shows a picture of the Voortrekkers on their way to Natal. The storm clouds and the lightning in the distance give an indication of the hardships they had to experience and the woman and the lamb typifies the patience they had to show to overcome these hardships.

Memorial

The 1½d. shows a picture of the Memorial and in this design we note the native shields and powder horns showing the settlement was not too peaceful. The 3d. has three parts in the design. The centre has a candle burning on an open bible. On one side a woman and child and a sheep and a lamb, and on the other side a man and his dog all looking towards the centre.

In addition to all those described there are, of course, the stamps which have been issued by so many countries in commemoration of the 75th anniversary of the Universal Postal Union. So that you have a very full packet if you can get hold of all the new issues of the last month even.

MISCELLANEOUS ADVERTISEMENTS

PHOTOGRAPHIC enlargements. For specimen postcard and price list, send negative and 2½d.—Boucher, 228 Croydon Road, Beddington, Croydon.

FREE Bahawalpurs', Colonial discount approvals. Postage.—Bishop, 40 Marine Parade, Hythe, Kent.

STAMPS free—Queen Victoria packet, including old Colonials free to approval applicants.—Robert J. Peck, 7A Kemp Road, Bournemouth, Hants.

INTRODUCTIONS. Pen friends, companionship or marriage.—V.C.C., 34 Honeywell Road, London, S.W.11.

HOMEWORKERS wanted, light assembly work. Good pay, S.A.E.—Esprey, 29 Newmans Grove, Rugeley, Staffs.

STAMPS—free gift, discount approvals, write—Ridley, 50 Fellside. Cleadon, South Shields.

LEAD toy casting—a new book with 126 illustrations, 2/6 posted with catalogue of moulds. Sample mould, 4/6.—G. F. Rhead, Thurston End, Hawkedon, Bury St. Edmunds.

PROFIT and pleasure for model makers, making ships in bottles. Complete plans and instructions, 2/6.—Phillips, Littlecraft, Kingswear, S. Devon.

STAMP album, illustrated, 100 different stamps, mounts, 3/-.—Whitby, Godshill, Fordingbridge, Hants.

35 m/m. cinematograph films, cowboy, comedies, drama, interest, etc. 100ft., 4/6; 200ft., 7/6; 500ft., 15/9.—Jones, 51 Cranford Drive, Hayes, Middlesex.

BE Taller. Quickly! Safely! Privately! No appliances—no tablets—no dieting. Details, 6d. stamp.—Malcolm Ross, Height Specialist, BCM/HYTE, London, W.C.1.

MODELS. You can make lasting stone-hard models with Sankey's Pyruma Plastic Cement. Supplied in tins by Ironmongers, Hardwaremen and Builders' Merchants. Ask for instruction leaflet.

TRANSFERS for decorating toys, trays, furniture, fancy goods. List and samples free. Flowers, pixies, dogs, nursery rhymes.—H. Axon Harrison, Jersey.

LEARN Shorthand by April 1st (1 hour's study nightly). 1st lesson, 2½d. stamp.—Duttons (Dept. HB), 92 Gt. Russell St., London, W.C.1.

RUBBER tyred metal disc wheels finished in red, green or blue enamel. 2ins.—2/6, 3ins.—3/- per set of four. Post paid. Other sizes available up to 9ins.—The Joyden Toy Co.. 193 Chase Side, London, N.14.

YOUR Winter hobby. Build a fleet of Wilson's Lorries. Photographically illustrated lists, 6d.—Wilson's Lorries, Dept. H., 1 Gt. Winchester Street, London, E.C.2.

DOLL'S House fittings and papers; send S.A.E. for list. Doll's house plan special; send 2/6. Trade supplied.—Zimplan, 88 Ware Road, Hoddesdon.

LONELY? Then write Secretary U.C.C., 5B.B. Hay St., Braughing, Herts. Genuine. Est. 1905.

CONJURING and Magical tricks, lists 3d.—De Hempsey, 363 Sandycombe, Kew Gardens, Surrey.

PLYWOOD, new, 27×19×$\frac{3}{16}$in., 7 for 20/-; 27×16×$\frac{3}{16}$in., 9 for 21/8; 20×20×$\frac{3}{16}$in., 9 for 20/-. Veneered Oak, Mahogany Plain, Sepele, 7 for 29/9; Walnut, 7 for 32/6; Quartered Walnut, perfect panels, 7 for 60/-. All the above are well selected panels and will please. B.C. Pine Pieces (Ply), 17×7×¼in., new, 24 for 16/-; Parana Pine Pieces (Ply), 17×6½×$\frac{1}{8}$in., 48 for 20/-, all post paid. C.O.D. immediate delivery. You pay the Postman, 24 hour service. Pine lids, 39×17×1⅛ins., 3 for 24/-. Box sides, well seasoned timber, 18×16×⅝in. Oak, 8 for 20/-; Birch, 9 for 20/-; Mixed Hardwoods, 10 for 20/-. Teak, ¾in. thick, 5 for 20/-. Teak, 18×4½×½in., 40 for 20/-. Sacks of offcuts, 2/3in. wide by 6/8in. long, all thicknesses, approximately 28lbs., 10/-. All the above have one clean sanded face, are carriage forward for C.W.O. Large list of offcuts, plywood and veneered panels, 2d. post free.—Dept. H., JDD Storage, 71 Northcross Road, S.E.22.

PERSONS required make fancy goods at home. Write for details.—Melton Manufacturing Co., Southgate Street, Leicester.

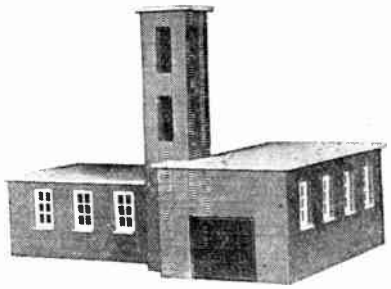
ENGRAVING on Perspex; send drawing and S.A.E. for quotation.—Geo. Cleaver, 50 Windsor Road, London, N.W.2.

CYCLISTS — "Cyclop" stop-thief Pump Clips, with double-roll locking action, positively prevents theft. Nickel, 1/3. Chromium, 2/-.—Korving Ltd., 12 Duke Street, London, S.W.1.

WHEELS for toys, and other accessories. Full lists will be sent on application to The Joyden Toy Co., 193 Chase Side, London, N.14.

100,000 Government surplus bargains. Warning lights, red, suit models, cycle rear lights, etc., 6d., P. 3d.; 16-bank switches, comprising 16 separate snap-action switches in one panel, 7/11, P. 9d.; aluminium rivets, approximately 1lb. assorted, 2/6, P. 6d.; sponge rubber strip, approximately 18ft.×1½ins.×⅝in., 2/-, P. 6d. Send 3d. stamp and S.A.E. for list of these and other bargains for the hobbyist.—Milligan's, 24 Harford Street, Liverpool, 3.

BLUSHING, shyness, nerves, self-consciousness, fears, ended. Details under plain cover, 1d.—Stebbing Treatment, 28 (HB) Dean Road, London, N.W.2.



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FURNISH that Doll's House with the latest model furniture, glassware, food and accessories. List 8d.—Sutton Models, Billericay.

FASCINATING and profitable hobby, casting ornaments, toys, etc. You can easily make these yourself. Paints, brushes and all accessories. Illustrated catalogue of 700 moulds, plus latest list of rubber moulds, with instructions, 9d. post free.—Cock of North Moulds (H), 140 Hollings Road, Bradford.

Miscellaneous Advertisements—*Continued*

HOME watch and clock repair outfit. Includes watchmaker's eyeglass, tweezers, screwdrivers, oilers, brush, oil, plus explanatory booklet fully illustrated. In container. Skill unnecessary. Invaluable for all fine work, 12/9 inclusive.—D. Bolster (Dept. A.), 5A Station Parade, Ashford, Middx.

BALSA Wood, Tissue, Dope, Cement, Rubber, etc. The Modeller's Postal Service. List from Foyurone Models, 31 Thirsk Road, London, S.W.11.

WOODTURNING for beginners. Complete guide including construction of a home-made lathe. 3/9 posted.—Quadrant Books (Dept. 4), 17 Quadrant Arcade, Regent Street, London, W.1.

AMERICAN Magazines post free for one year. Popular Mechanics, 32/-; Popular Science, 28/6; Mechanix Illustrated, 22/6; Popular Homecraft, 18/-. Stamp for full list of others.—Willen Ltd. (Dept. 57), 101 Fleet Street, London, E.C.4.

ENTER the Juneero National Model Making Competition. Cash and kit prizes to the value of £150. Send now for details or see the Juneero Annual, 1/- from all Juneero Dealers or 1/2 post free from Juneero Ltd , Boreham Wood, Herts.

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Hobbies WEEKLY

CONTENTS

March 8th, 1950 Price Fourpence Vol. 109 No. 2836

A HOME-MADE ROCKING CHAIR

THIS comfortable design of chair is quite within the scope of the home woodworker, and is well worth the time and labour of constructing. If there is a choice of timber in the matter, then oak or beech is about the best wood to use, otherwise a good quality deal can be used and should make a substantial article of furniture.

Framework

Fig. 1 is a side view of the chair, and Fig. 2 a front view, giving the necessary dimensions. Any other measurements necessary can be taken as the work progresses, or will be found in the text. A cutting list at the end of the article is added, as a help to ordering the wood.

The legs are cut from 1¼in. square wood, and should be cut to the length given, plus 1in. at the bottom for the tenons entering the rockers, and ½in. at top for the stub tenons entering the arm rests. The former are cut ½in. thick and 1in. deep; the latter ¾in. square and ½in. high. Details of these are given in Fig. 3, also of the joints used for the rails.

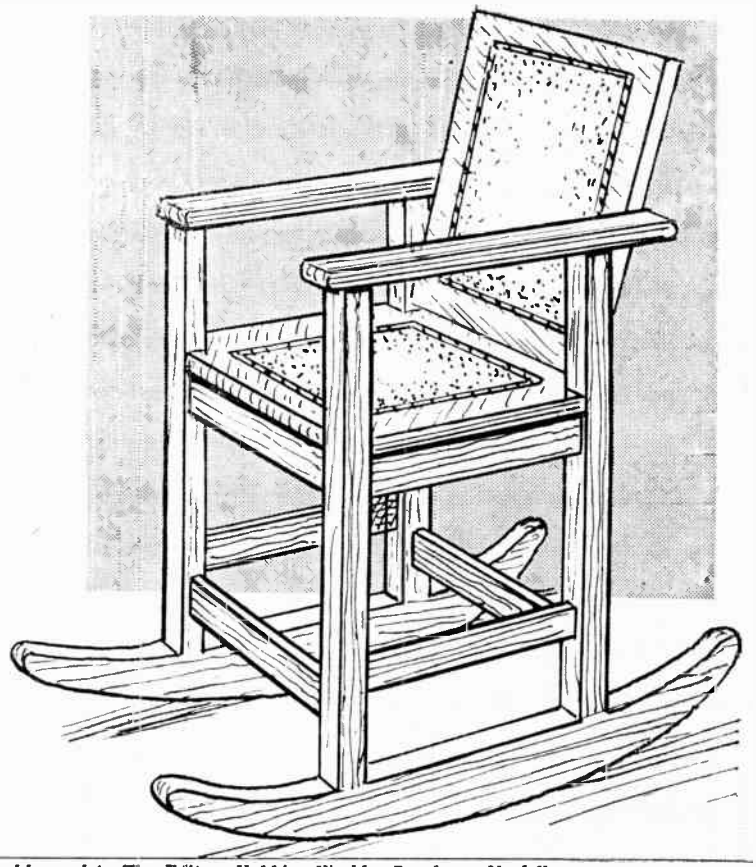
The seat rails are of 1in. by 1½in. wood. The tenons are 1in. long and ½in. thick, and as they meet together in the mortises in the legs, the ends of them have to be neatly mitred.

Lower Rails

The lower side rails are 4ins. up from the bottom, the front and rear rails 2ins. up. Tenons for these are ½in. thick and 1in. long. These rails are also of 1in. by 1½in. wood. Make the tenons a close neat fit for their respective mortises to better ensure a good fit. Try them in position.

The arm rests are cut to length given in Fig. 1 from 1in. by 2in. wood. Note that these are to be fitted on the top of the legs with their broader side down. At 1in. from one end of each, on the undersides, chisel out ¾in. square by ½in. deep mortises to fit the stub tenons on the legs.

Try in place, then mark out the position of the mortises for the rear legs to fit in and cut these out. It will be seen that the arm rests project about ⅜in. over the front legs and about 3½ins. over the back ones. The extra extension at the rear is to provide for



the chair back fitting at a comfortable slope.

All these parts except the arm rests, can now be glued together. Knock all joints well home and leave the framework for the glue to get hard. In the meantime, the seat and back frames can be put together.

A plan view of the framework (arm rests omitted) is given in Fig. 4 (A), which will help to make clear some of the above details of construction. On this the seat frame (B) is to be laid. This is a frame of 1in. by 3in. wood for side and rear pieces, and 1in. by 2in. for the front piece. The parts can be just halved together and glued.

At each corner a 1½in. square is cut out to fit over the legs. The front edge is neatly rounded off for comfort. When the corners are cut away, a screw or two can be driven in the joints at each corner, underneath, to stiffen the whole.

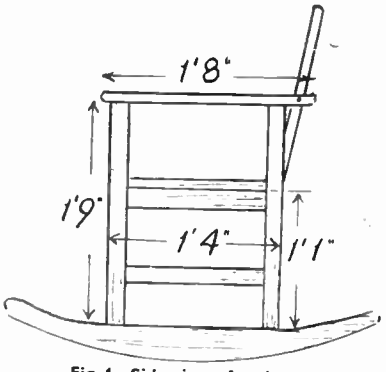


Fig. 1—Side view of main parts

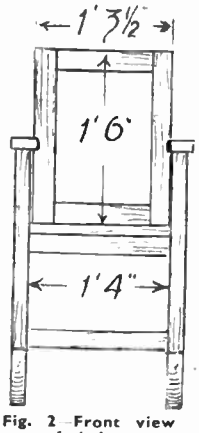


Fig. 2—Front view of chair

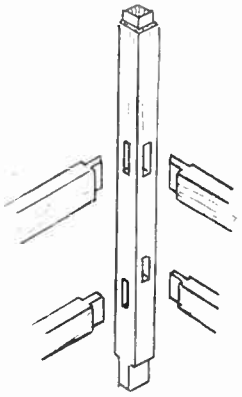


Fig. 3—Detail of joints

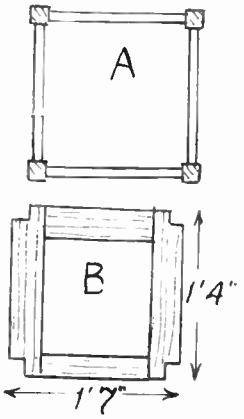


Fig. 4—Plan of seat frames

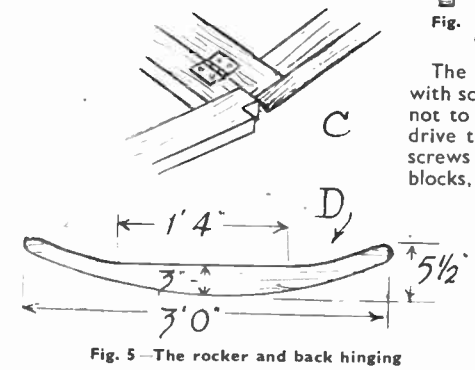


Fig. 5—The rocker and back hinging

The back frame is seen in Figs. 1 and 2, and is similarly made up as the seat frame, from 1in. by 2in. wood. Readers who do not mind a little extra trouble can well joint both frames together with mortise and tenon joints and make a more professional looking article. This back frame is then hinged to the seat frame, after the latter is fitted in place, with 2in. iron butt hinges, as at (C), Fig. 5.

The seat frame is fixed over the rails with screws, driven in from underneath, not to be on view. To avoid having to drive the screws through the rails, the screws can be driven through wood blocks, one each side, the blocks themselves being screwed to the rails on the inside. The arm rests can now be glued in place.

To complete the woodwork part of the job, only the rockers are now required. These are detailed more clearly at (D) in Fig. 5. They are cut from wood 1¼ins. to 1½ins. thick, and 5½ins. long. First, from the centre part of the top edge, cut out a piece 1ft. 4ins. long, and 2½ins. deep, then from there, each side, shape up to the ends.

Leave the bottom curve for the moment. Place the chair on the rockers and mark with a pencil the shape of the tenons on the legs as a guide to cutting the mortises for them in the rockers. These mortises are cut 1in. deep.

If fit is satisfactory, mark the curved bottom, either with a length of string and a pencil (the old stunt) or by bending a flexible strip of thin wood from one end of the rocker to the other. A smooth curve is necessary here. When satisfactory, saw out with a keyhole saw, or better still, a bow saw.

Now glue the chair to its rockers. Fit the back at a comfortable slope, either with a screw at each side or pegs, the latter fitting in a hole in each arm rest. Two or more such holes can be bored, then the back can be adjusted to a different slope, as preferred, within limits, of course. Too much backward slope is undesirable, as the chair might topple over sometime.

Glasspaper the work, then stain and varnish oak or walnut colour, as desired. Simple upholstery can be carried out to seat and back, as instructed in previous numbers of Hobbies, or both can be just webbed, and covered with American cloth or other materials, and comfort ensured by the addition of cushions.

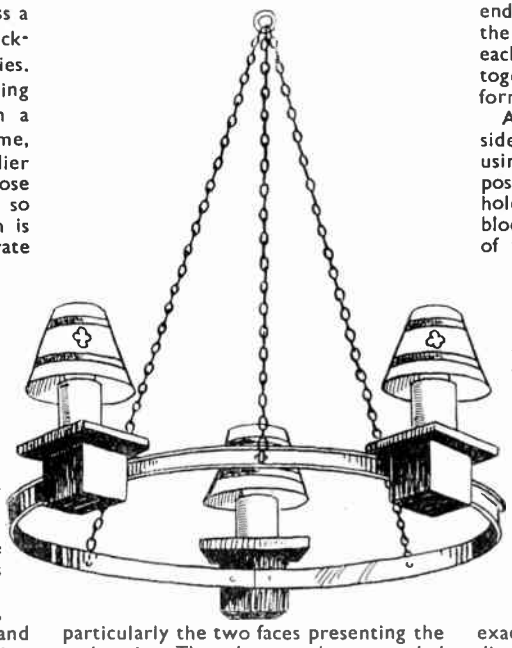
CUTTING LIST

Legs (4) 1½ins. by 1½ins. by 1ft. 10½ins.
Rails (4)—1in. by 1½ins. by 1ft. 3ins.
Rails (4)—1in. by 1½ins. by 1ft. 6ins.
Arm rests (2)—1in. by 2ins. by 1ft. 8ins.
Rockers (2)—1¼ins. by 5½ins. by 3ft. 0ins.
For seat and back frames—1in. by 2ins. by 8ft. run.
For seat and back frames 1in. by 3ins. by 5ft. run.
One pair of 2in. iron butt hinges.

Curtain rail and wood blocks make an attractive electric LIGHT PENDANT

ELECTRIC candle pendants possess a certain character which seems lacking in the bowl-and-shade varieties. They are adaptable to most furnishing styles, and they fit equally well in a modern chromium-and-plastic scheme, or the dark-oak and pewter of an earlier period. The main problem is that those displayed in the shops are usually so expensive that an alternative, which is attractive only by reason of its moderate price, is often made to do.

But it is possible to overcome this problem, and with very little trouble produce a candle pendant at a cost of only a few shillings.



Curtain Rail

The main shape of the pendant can be contrived from a strip of brass curtain railway and a corresponding valance rail, such as can be bought at most department stores. The length of each piece should be 3ft. 6ins. They should be laid together so the valance rail fits snugly between the flanges on one side of the curtain strip.

With the valance rail on the inside, bend both strips to form a complete and perfect circle, 13½ins. in diameter. It is a good plan to use the garden roller as an anvil on which to beat out any irregularities in the shape, but use only a wooden mallet so as to avoid marring or flattening the soft brass of the strips.

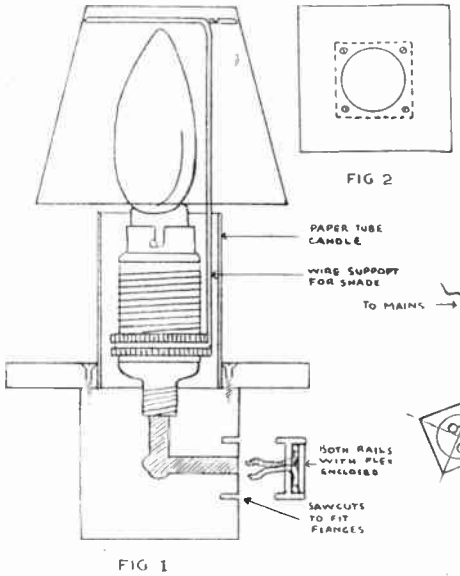


FIG 1

FIG 2

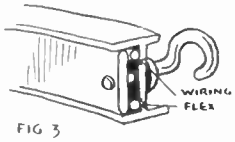


FIG 3

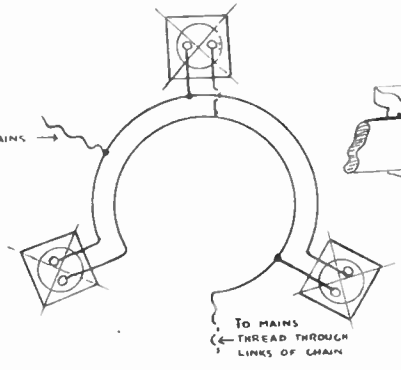


FIG 4

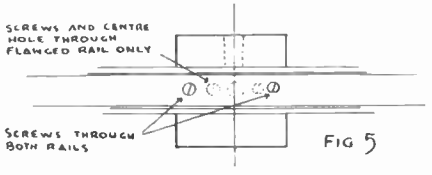


FIG 5

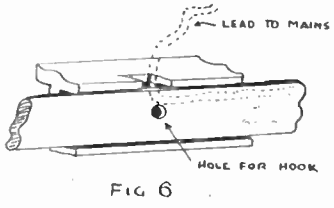


FIG 6

The candle holders are 2in. blocks cut from any scrap length of 2in. square wood, although it is best if this is of oak. Similarly, the flat top pieces, which are 3ins. square, can be cut from scrap pieces, ¼in. thick.

The blocks should be properly squared up and glasspapered to a fine finish, particularly the two faces presenting the end grain. The edges are best rounded just sufficiently to relieve the sharpness of the angle. Mark the exact centre of two adjoining sides of each block, and drill a ¼in. hole a little more than halfway through the blocks from each selected face. The two drillings will thus meet at right angles in the centre (Fig. 1).

The flanged curtain strip is also drilled with two ¼in. holes, spaced exactly 14ins. along the circumference, measuring from the cut ends. The third hole is made at the actual point where these ends join. It is cut with a circular file in the form of a semi-circular notch on each edge, so when they are brought together a hole ¼in. in diameter is formed.

At a point ⅜in. distance from either side of the three holes drill smaller holes, using an ⅛in. drill. Place the blocks in position round the strip so the ¼in. holes coincide exactly and mark on each block the points where the flanged edges of the strip make contact. At these marks, make saw-cuts just deep enough to receive the flanges snugly (Fig. 1).

Fix the blocks firmly to the brass strip with small brass screws inserted from the inside of the ring through the small ⅛in. holes. The two screws at the extreme ends of the strip will serve the dual purpose of fixing the block into position and, at the same time, join the strip into the complete circular form.

Bulb Holders

The flat 3in. squares for the top pieces should be finished with glasspaper to match the blocks, and in the exact centre of each cut a hole 1¼ins. diameter. The squares are centred over the uppermost holes in the blocks and fixed into position with four small counter-sunk screws (Fig. 2).

The bases or bushes of the bulb-holders are also centred and fixed into position over the ¼in. holes in the blocks. If the imitation candle type of bulb is being used for the completed pendant, miniature bulb-holders will be required. But if it is intended to use bulbs of a higher wattage, standard-size holders should be fitted (Fig. 1).

Wiring of the holders is in parallel, and is carried out with light, single flex so one wire can be tucked away under the shoulder of the upper flange, while the other is laid along the flange on the bottom edge of the brass rail (Fig. 4). Leave 2ft or 3ft. of flex free on each side of the wiring, but arrange that these lead off from opposite ends so they may

be threaded through the links of separate hanging chains to the ceiling rose (Fig. 4).

The valance rail is fitted on the inside of the curtain rail ring for the purpose of enclosing the wiring and making a neat finish. The inside diameter being slightly smaller, it will be necessary to trim 1in. or so from the end of the valance rail before the join will meet flush. Arrange that the join comes at the centre of one of the blocks, but it should not be that on which the flanged strip is joined.

Rail Fixing

The valance rail is fixed to the blocks in the same manner as the flanged strip, except that holes for the screws are drilled at points $\frac{3}{4}$in. on either side of the centre line of the blocks (Fig. 5). In making these drillings and fitting the screws take care that the insulation of the wiring is not cut or damaged.

Further $\frac{1}{8}$in. holes are drilled through the centre of both strips exactly midway between each block to take hooks for hanging the fitting. Immediately above two of these holes the inside flange of the outside rail should be cut away to form outlets through which the two free ends of flex are threaded (Fig. 6).

The hooks for hanging the pendant are provided by three brass cup or dresser-hooks. These are fitted in the holes between the blocks, and the portion of the shank which protrudes on the inside of the ring is filed off to within $\frac{1}{16}$in. of the rail. The stub is burred over in the manner of a rivet (Fig. 3).

Chain Hangers

The chains which are attached to the hooks may be of the pressed-link, picture-hanging variety, but the links should be sufficiently open to allow the supply flex to be threaded through. Alternatively, a very effective chain can be made up at home with a few dozen of those links shaped like a figure 8, which can be obtained from the same store which supplied the curtain railway. The length of the chains will, of course, be governed by the height of the ceiling.

The 'candles' are made from strips of white cartridge paper or thin card, rolled to form a tube $1\frac{1}{4}$ins. diameter and sufficiently high to hide the bulb holder, without hindering the fixing of the bulb.

The Shades

The shades can be bought, ready-made, or they, too, can be made from cones of white drawing paper. An exclusive design can be drawn in coloured inks and the shade coated with toilet paraffin or other white oil to render it transparent.

Each shade is supported by a short piece of stiff wire, bent to a circular shape at each end. The top circle should be the same in diameter as the upper edge of the shade, and the lower end of the wire should be bent to fit round the bulb-holder, where it is fixed in position by the screwed locking ring provided (Fig. 1).

In common with all such items which are designed to suit a certain home, the final finish of the completed fitting is a matter of personal taste. If it is intended for a modern scheme of furnishing, the brass ring may be left bright, and the wooden candle-holders stained to match the furniture and brushed over with button polish.

Wrought Iron Effect

To conform to the character of an earlier period, the whole of the pendant can be painted black, with the effect of wrought iron. Or, again, the wooden parts may be stained dark-oak colour and polished with beeswax, and the brass 'oxidized' or toned down to match with a brushing of the same stain.

The chains should, of course, harmonise, and it is advisable to decide first upon the style of finish which is being adopted, so that the chains can be obtained either bright or oxidised, according to the appearance of the finished job. Be sure to fix the whole thing firmly to the ceiling.

For awkward or out-of-the-way branches make this

EXTENSION PRUNING TOOL

IT will soon be time to start trimming your shrubs and trees, and it is not always easy to reach all the odd twigs even with the aid of a pair of steps or ladder. The short time required to make the little gadget described here will be amply repaid by its usefulness. However inaccessible a branch may seem it will be possible to reach it with this handy pruner.

An ordinary pair of hand secateurs is firmly fastened to the top of a long wood handle by means of a piece of sheet metal bent to shape and bolted on. The act of cutting being worked by a wire from the handle of the secateurs and leading down the wooden handle.

A piece of fairly stout gauge sheet metal is needed. This must not be so thick that it is impossible to bend it to the necessary shape. It is not important what metal is used; brass is probably the best on account of its easy working qualities.

The Metal Holder

A piece 9ins. long and 3ins. wide should be large enough, although the exact size depends on the size and shape of your cutters. For the same reason no definite measurements can be given as to where to bend the sheet in order to hold the cutters.

We will assume the width of the handle is about $\frac{1}{2}$in., so if you mark this width down the centre of the sheet you will be able to make two right angle bends down the entire length.

Now slip the handle of the cutters in and mark the position for the two bolt holes. They should be made as close to the handle as possible and can take $\frac{1}{4}$in. metal screws with nuts. When the nuts are screwed up tight, the cutters should be held quite rigid. Some types of cutters are made with curved handles and it may be necessary to cut a piece of wood to fit and wedge them up tightly.

Wheel for Wire

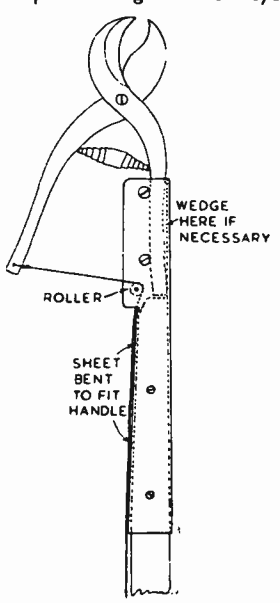
Just below the bottom bolt hole is a roller for the wire to pass over. It is quite small and can be made from a piece of tube placed over a wire nail and riveted over. When the bottom bolt is screwed up the roller should not be tight, but should just be free enough to roll easily.

The bottom part of the sheet metal holder is bent over to fit round the wooden pole. A piece about 1in. square would be about right for this. The top part can be tapered slightly to fit and then screwed on with two wood screws. The pole can be made any length to suit your needs.

The wire to operate the cutters is fixed to the bottom of the free handle. Flexible steel wire such as is used on a cycle three speed is best for the purpose.

Some cutters have a hole or clip to fasten the handles when not in use. The wire can be easily fixed here. Otherwise it will be necessary to twist it round the handle and bind securely with a piece of copper wire. Lead the wire over the roller and down the pole handle where it can pass through a screw eye and end by being fastened to a metal curtain ring.

Keep the cutters well oiled and make sure that the blades are always sharp. In this condition they should not give any trouble and should prove one of the gardener's most useful tools.



How the amateur electrician can instal various types of BURGLAR ALARMS

MANY different forms of burglar alarm are to be found, but the simplest types are quite straightforward and may easily be fitted up without difficulty. A loud electric bell is commonly used. This sounds when any window is opened, thus warning the owner, while at the same time making the burglar know his attempted housebreaking is discovered. Such an arrangement is an effective crime preventer, it being assumed few burglars would endeavour to complete their plan in the face of an unexpected clamorous warning bell.

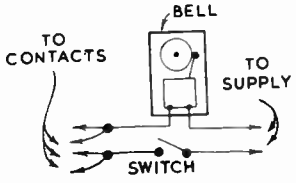


Fig. 1—The wiring system

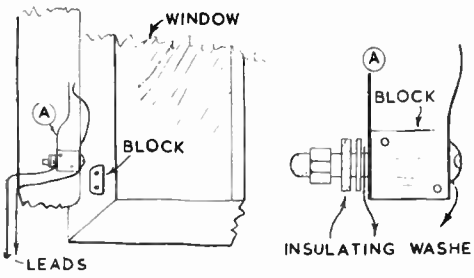


Fig. 2—Contacts for window and door

An arrangement whereby the same result is achieved when anyone steps on a mat placed in a doorway or elsewhere is also possible, and this can be modified for use in shops to serve as a warning that a customer has entered.

Bell Circuit

Fig. 1 shows this part of the installation and if two terminals are provided as many leads as desired may be taken to the contacts, the closing of which will cause the bell to ring.

The supply may be obtained from an accumulator, dry cells (bell batteries being best), or a bell transformer wired to the mains. This is a matter for personal preference.

The switch is included so the circuit may be put out of action during the daylight hours when many people may be coming or going on normal business. The bell may be situated in the hall or some other centralised position, or installed in a private room, if preferred. Many types of electric bell are readily obtainable.

If the bell is driven from a mains transformer, then the primary of this transformer is connected to the mains and the secondary, which will usually deliver between 4 and 8 volts, will supply the bell circuit.. No difficulty should arise here, but it should be remembered that transformers will only operate from A.C. mains, not from D.C. mains.

Window and Door Contacts

Fig. 2 shows how these may be arranged, and the detail at A will enable the contacts to be made. The small block of wood or other insulating material can be about ½in. or ¾in. square and is drilled with two small holes so it can be screwed to the fixed part of the window or door frame.

The contact pieces should be about 2ins. long and ¼ in. wide, and may be held in place by a bolt with insulated washer, as shown, or by using small wood-screws. If the latter method is employed the points of the screws must not touch inside the block or there will be a continuous short-circuit.

A small block is also screwed to the window, and the strips are so bent that when the window is opened the one strip is pushed firmly against the other.

With doors, the block may be screwed so the strips project outwards above the door. When the latter is opened, the top edge will press the strips together and if the contacts are fairly near the hinged side of the door the circuit will be kept closed for a considerable movement of the door itself.

Wiring Up

Cheap twin flex can be used for wiring, and the leads may be run as far as possible out of sight, and in the most convenient manner, back to the two terminals connected to the bell and switch shown in Fig. 1.

All the pairs of contacts used will be wired in parallel and numerous pairs of contacts may be looped in to a single run of twin flex where this is convenient. If leads are kept close against wall and woodwork there will be no unsightly or loose connections visible, and insulated staples can be used as a further aid to obtaining a reliable and neat wiring arrangement.

A Latching Relay

With the arrangement already described, the bell will cease to ring when the window or door is moved to a position which permits the contacts to open again. With an arrangement intended to show when customers enter a shop, this is in order, but with a burglar alarm it is desirable that the bell should continue to ring until turned off by the householder.

By using a relay which locks itself in the 'On' position once energised, this can be arranged. Such a relay is shown in Fig. 3. When the magnets are energised, even if only for a moment, the armature is pulled behind the catch, thus completing the circuit between armature and catch, which causes the bell to ring. If the window or door is closed and the circuit broken, the magnets are no longer energised, but the armature still remains behind the tip of the catch until the latter is drawn back by hand, freeing the armature.

Two bell magnets, or bobbins about ¾in. in diameter and 1in. long wound with 22 S.W.G. wire can be used. They should have iron cores and be wound in different directions, viewing them from their free ends. Armature and catch can be cut from iron or tinplate, supported on springy strips of metal bolted to small brackets. The whole can easily be made on a small piece of wood, following the arrangement illustrated.

Doormat Contacts

The drawing at Fig. 4 illustrates an arrangement which can be placed under any mat. So that it will give a long period of service the plywood used should be of good quality and well varnished both sides. The sheets should be large—about 2ft. by 1ft. at least, and are held apart by narrow strips all round.

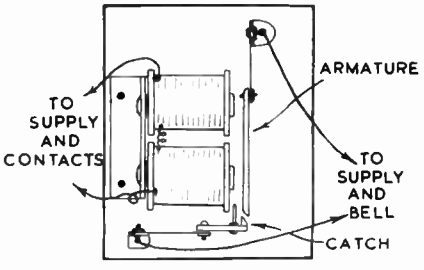


Fig. 3—A latching relay

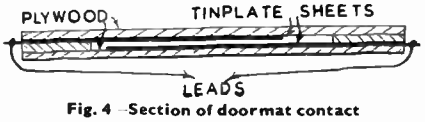


Fig. 4—Section of doormat contact

Two large sheets of tinplate form the contacts, one being on top of the lower piece of plywood, and the other underneath the upper plywood. The distance between the metal sheets will be quite small and a person's weight will cause the circuit to be completed.

All the sheets may be secured together by a number of small woodscrews passing through the various thicknesses of material.

The whole thing is placed under a doormat and this, when trodden upon makes contact and so creates an alarm. It is useful, of course, as a warning when anyone comes into a shop apart from its usefulness in other directions.

A useful adjunct to workshop or kitchen is this folding

DROP-LEAF BENCH-TABLE

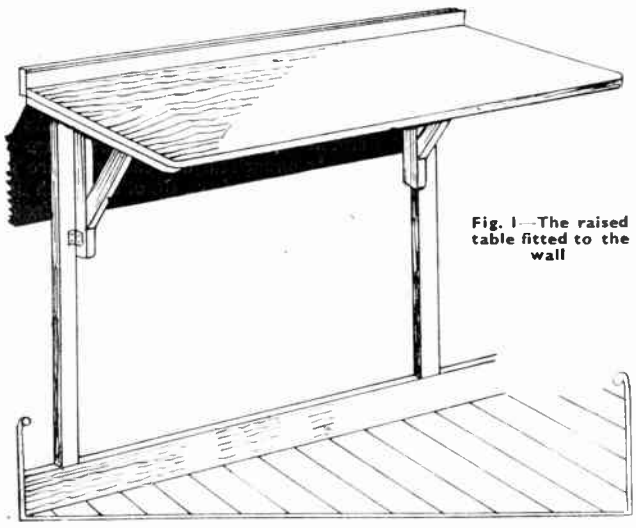


Fig. 1—The raised table fitted to the wall

THE flap table shown here complete in Fig. 1 is simple to make and a most suitable addition where space is limited. As it folds down flat against the wall, it really takes up but very little space. Deal would be the most suitable wood to use to make up the table, as only the simple mortise and tenon joint is used to frame the parts together

This work should come within the scope of the average amateur woodworker. The table is made in four parts, consisting of a back frame, the table top and two brackets. The back frame is first prepared and fixed to the wall.

The table top is hinged to the top rail of this frame, and the brackets, which support the top are hinged to the side upright rails of the frame.

The Wall Frame

Fig. 2 gives details of the back frame and the brackets with dimensions for a table of useful size. The various joints, etc., are given in the details, Figs. 3 to 7.

A start may be made upon the back frame, see Fig. 2. This consists of a top rail (A), 36ins. long, and two upright rails (B), the length of these being decided by the height the table is required from the floor. Rail (A) might be 2ins. by ¾in. in section while the side rails (B) might be 1½ins. by ¾in. in section.

The top and side rails are halved together, as Fig. 4 shows, the halvings being carefully marked out before cutting with the small-tooth tenon saw and chisel. Glue and screws will be used to hold the joints firmly.

The width between the upright rails is given in Fig. 2. The front top edge of the rail (A) should be chamfered or rounded off neatly. The framework can be fixed to the wall by means of Rawlplugs or wood pins cemented into the wall in which the screws may be put.

The lower ends of the upright rails should rest upon the top edge of the skirting or direct upon the floor in its absence. The next operation is the making of the brackets, see Figs. 2 and 3.

Support Brackets

Each bracket consists of an upright (C), a top rail (D) and the support (E), and wood 1½ins. by ¾in. in section is suitable for all these parts. Two methods of framing the rails together are shown in Figs. 5 and 6. In the former figure, the rails (C) and (D) are halved together, and the support (E) recessed into (C).

This is the simplest form of jointing, while that shown in Fig. 6 is, perhaps, the stronger, but at the same time is more difficult to mark out and to cut. Glue should be used to secure the joints, with screws put in where possible. The outer ends of the rails (C) and (D) should be cut round with the fretsaw and made smooth with coarse and fine glasspaper.

The brackets are then hinged to the side rails of the back frame, in the manner shown in Figs. 2 and 3. Four brass 2in. hinges should be used.

The Table Top

The table top will be the next consideration and the detail of its simple construction is given in Fig. 7. Two planed boards about 36ins. long and 7½ins. wide or three boards 5ins. wide are glued and securely held near their ends by cross battens 2ins. by ¾in. in section.

Three grooved and tongued boards would make the stiffest table with side ledges glued and screwed, as shown in the detail. The screws should be brass and countersunk neatly. Round off the forward corners of the table before fixing it. The table is fixed with brass hinges to the lower edge of the frame rail (A).

The underneath cross battens will fall flush with the wall. A pair of flap hinges will be used and put on, as detail Fig. 7 indicates. Care must be exercised in fitting the flap to see that it rests level and squarely on top of the two brackets when these latter are brought forward.

To finish the table, the back frame, brackets, and the underside of the top should be stained and varnished, or the whole could be painted to match the paint of the room or hall wherever it might be fixed. This work of finishing should be carefully and properly undertaken, particularly if the bench is in the hall.

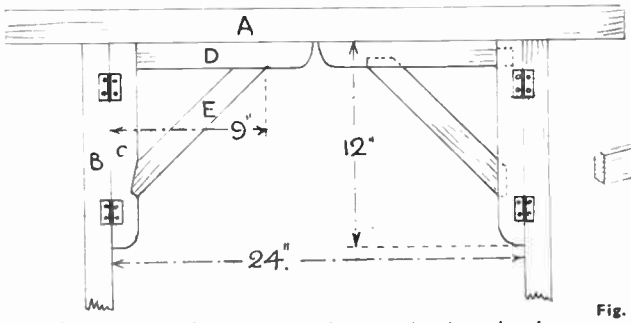


Fig. 2—Showing wall framework and support brackets closed

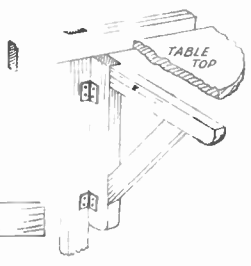


Fig. 3 The bracket hinged

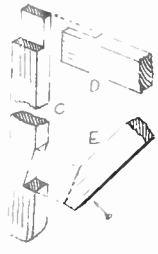


Fig. 5 Angle joints

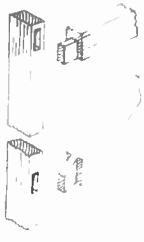


Fig. 6 Mortise joints

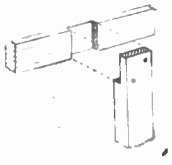


Fig. 4—Halving joint

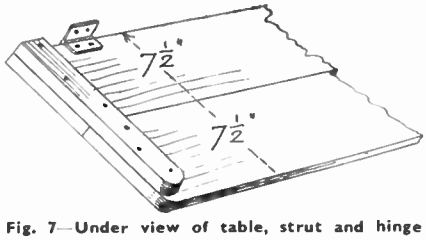


Fig. 7—Under view of table, strut and hinge

You can have interesting studies if you make this

SIMPLE MICROSCOPE

THE owner of a microscope is to be envied just now, especially with the very high-price of these optical instruments. Many readers would like to possess one but feel they cannot afford it. It is very nice to know, therefore, that this need not deter them, as it is really quite a simple matter to build up a very efficient little instrument. The cost need not run to more than a few shillings, and it is even possible that you may already possess all the necessary parts and can start right away.

The study of microscopy is one of the most interesting of hobbies, and besides being highly instructive it can lead you to do some research work that may be of real value to science. It is a hobby that we can indulge in at all times of the year, as there is always plenty of matter available for examination.

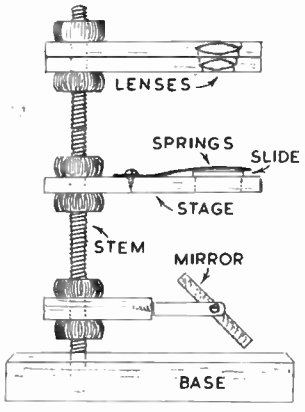


Fig. 1—Side view showing parts

Fig. 3—The lens arm

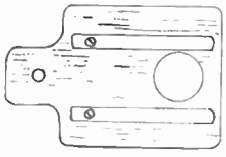


Fig. 4—The stage and slide

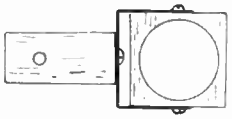


Fig. 5—The mirror holder

Fig. 2 Lens types

For the observation of many things the simple microscope described on this page is more useful than a high power expensive instrument; and even when you can afford to make or buy a better one this simple apparatus will still be needed quite a lot.

The Lens

The most important part of any microscope is the lens. The very simple ones need only one, but the larger compound microscopes often have quite an array of lenses. A most interesting article on lenses has appeared in a recent issue of 'Hobbies Weekly', and much useful information can be obtained from this article.

If you have not got an odd lens or two, you can easily buy one from an optician, or a tour round a second-hand shop should provide something quite cheaply. A small convex lens of any kind is what is wanted—it may be a double convex as Fig. 2(A) or it can be a plano convex Fig. 2(B). It is even possible to use two or three of these on top of each other in order to obtain more magnification.

The Stand

A very essential feature ofa microscope is a good steady stand, so the heavier you make the baseboard the better. Oak, walnut or mahogany about 1in. thick 6ins. long and 4ins. wide will do nicely. Bevel the top edges and glass-paper quite smooth. If you like you can make a sink in the base and fill in with lead, afterwards covering it over with a piece of baize.

The stem shown in Fig. 1 which holds the lens, stage and mirror is an 8in. length of screwed brass rod. A radio shop should be able to supply this, also the six nuts to fit on to it. The best size is 0 B.A., but if this is a job to obtain, 2 B.A. will do, although it will not make such a steady stem.

Drill a hole in the base about 1½in. from the end perfectly upright, tap it and screw in the stem. It is very necessary that it should be a tight fit and if you cannot do the job yourself the radio shop will probably be able to help you.

We will mount the lens or lenses next—two are shown in Fig. 1 but you may have only one or you can use three or more. Quite an elaborate and indeed very useful microscope might have half a dozen different lenses of various powers all on the stem—those not wanted can be swung out of the way until another power is needed.

A lens having a focal length of 1in. is a very useful size to start off with—this will give an amplification of about ten diameters. It is mounted firmly into a piece of wood—mahogany is probably the best to work with and the size will depend somewhat on the diameter and thickness of the lens (see Fig. 3).

About 4½ins. is a good length and the width should be just sufficient to hold the lens secure. The thickness must be a trifle more than the thickness of the lens so as to avoid any scratching when the wooden arms are swung round.

Make the stem hole an easy fit: the arms are tightened with the thumb screws on the stem. When mounting several lenses it is very important that the distance from the stem hole to the centre of the lens should all be the same.

After the lenses are mounted we need a stage on which to place the slides and objects we wish to examine. It is somewhat similar to the lens arm and is shown in Fig. 4. The distance from the stem hole to the centre of the hole must be the same as the lens arm.

The Stage

A useful size for the stage would be 3ins. wide which will allow for a hole 1in. diameter and a spring along each side to hold the slides secure. The thickness need not be more than ¼in. Strips of thin sheet brass about 3in. long and ½in. wide will do for the two springs, which are held in position by small round head screws.

In order to illuminate most of the specimens which you will examine it is necessary to have a small adjustable mirror fixed underneath the stage to reflect the light on to or through the object.

Fig. 5 shows how to mount the mirror, which can be 1½ins. to 2ins. diameter. A piece of wood just a little larger than the mirror is used to hold it secure, and it can be let into the wood so that it is flush with the top—a spot of glue will hold it in place.

The Mirror

The mirror is now fitted into what is called a 'gimbal' mount, which will enable it to be twisted into any position. A strip of stout brass bent to the shape shown in Fig. 5 is fixed to the centre of the mirror block with round head screws. The other swivelling motion is given to the gimbal by screwing the centre of the strip to a short block of wood, which in turn slides down the microscope stem and takes its position near its base.

It is important that the distance from the stem hole to the centre of the mirror should be the same as for the lens arms. To complete the microscope and to give it a somewhat professional appearance all the wood parts should be french polished.

A Container

It is quite a good idea to make a box to keep the instrument in when it is not being used. Dust and damp are the enemies of microscopes and especially of the slides, and therefore it is up to you to do your best to protect them.

Having built your microscope a few words on how to use it to the best advantage will not be out of place here. The object you wish to examine is placed on a slide, clipped on to the stage and centred over the hole. A slide is a piece of thin glass about 3ins. long and 1in. wide.

Swing the largest and lowest power single lens into position and then adjust the mirror so that it throws the source of light on to the slide. It is now only necessary to bring the object into focus and this is perhaps best done by screwing

(Continued foot of page 360)

Patterns are printed full size on page 365 for completing

A NOVELTY CUT-OUT

HERE is a novel and colourful cut-out picture plaque for those who are able to cut accurately to line with a fine fretsaw. Two copies of the design are needed; either two printed patterns taken from two copies of the magazine, or a tracing of the outlines can be made. This is transferred to the wood with carbon paper and a hard, sharp-pointed pencil, and the original retained as a reference to the painting.

The pattern is, then, by one or other means, transferred to the wood and the outlines only cut. The small silhouetted sketch shows what the wood will look like at this stage. The wood must be plywood with the outside grain the long way of the figures, and need not be more than ⅛in. thick. Thin plastic sheet may well be used.

After cutting out, glasspaper well and use, where necessary, a small fretwork file or glasspaper to remove any 'whiskers'. The drawing can then be touched up with a pencil and finally painted with bright enamels. Before doing this, the edges can be blacked.

As regards colours, the following are merely hints, though they are based on colours of actual peasant costumes. First figure (left): Pea-green hat, red shirt with white spots, brown trousers, black boots. Second figure: White hat, black hair, brown blouse, red skirt with yellow spots, blue apron, white stockings, black shoes with yellow buckle. Third figure: Pea-green hat and jacket, the latter with yellow buttons at the back, black boots. Fourth figure: Black hat, white shirt, green breeches and braces, blue stockings, black shoes. Fifth figure: White blouse, purple skirt, lilac apron, white stockings, black shoes, brown hat with yellow ribbons.

The grass is light green and the tree foliage a darker green, the trunks being brown. One or two small flowers may be painted on the grass. For flesh tint, mix white, yellow and red (only a little red). For pea green, add some blue to the green. Red and black make a good brown.

This plaque may be hung against a plain wall. Two small squares of ply may be glued to the rear of the top corners so small screw-eyes may be driven in, from behind, for hanging purposes.

The plaque, however, may well be backed. For example, cut another sheet of thin ply to exactly the same size as the overall dimensions of the fretted piece. Paint this sky blue all over. Let it dry thoroughly. Apply glue very carefully to the back of the fretted piece (which has already been coloured). Lay the fretted piece over the blue piece and keep under pressure until the glue has set.

As already hinted, extreme care must be taken to see that no glue oozes out on to the blue, as this would completely spoil the effect. Keep the glue (tube glue) well within the boundaries of the fretted part and allow for the glue to move outwards a bit when pressure is applied.

Backing the Figures

It is possible to have a silhouetted effect by blacking the whole of the fretted part instead of colouring it. If this is done, it is best to lower the rear grass line a bit so that more of the feet appear in silhouette.

Having made such a plaque, the reader may care to design others. If not his own original designs, then those can be adapted from illustrations in books, provided, of course, such designs are not made up in quantity and sold commercially.

It is best to avoid full-face views and to rely on back views and profiles. Fine projections should be avoided. For example, in the design just described, the hat ribbons of the figure on the right are superimposed on the tree. It is quite possible to frame such pictures. A sheet of glass would certainly keep out dust.

Uneven Foliage

In cutting the foliage at the top, there is no need to keep too accurately to the printed outline, but, especially around the figures, care is essential. At the same time, an academic standard of art is not required. It will be noted, for example, that the hands have been put in very simply.

It is intended that the pattern be cleaned right off the paper before painting. If, however, the reader is unusually shaky in art matters, it is possible to glue the printed pattern on the wood. Besides holding the paper firmly, the glue will also act as size. The enamels can be painted over the paper. the guide lines for the feet, etc., remaining there.

Microscope—(*Continued from page* 359)

the stage up or down and then clamping it tight with the other screw.

Increasing Power

After you have inspected your object with the lowest power lens you can increase the power by using another lens, and then you may use two together, not forgetting to bring the object into focus with each change of lens.

At first you will probably want to examine anything you can lay your hands on, but later on you may decide to specialize in one or two subjects and learn all you can about them.

Insects will most likely form the subject of your first objects and here there is a vast field of highly interesting and beautiful matter available all the year round. The wings of flies, butterflies and moths. legs and heads of beetles and spiders, eyes of various kinds of flies are all worth spending quite a time in examining with different powers.

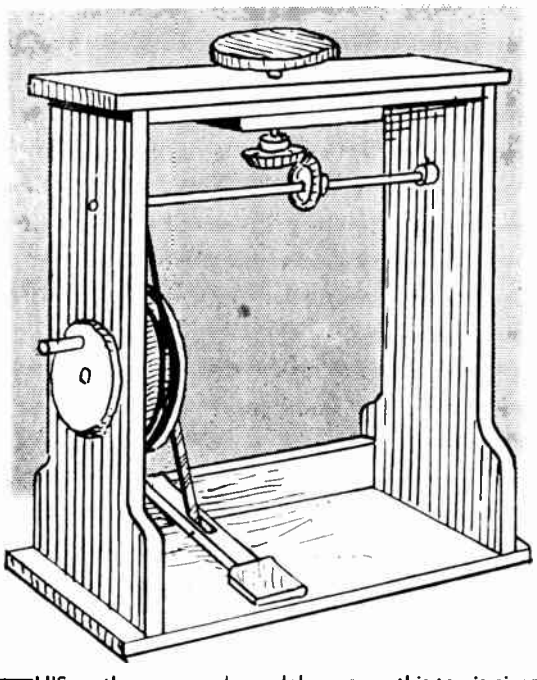
Turning for a moment to flowers and leaves we have such an array of specimens that it would be impossible to examine but a very small portion of them. Flowers can be taken to pieces to inspect the petals, stamens, the various kinds of hairs on the leaves and stems. The stems themselves can be examined by cutting off very thin slices with a razor blade.

Some people specialize in pollens and it is most interesting to note the different forms for each flower, as there is a different shaped pollen grain for every kind of flower.

Do not hurry over your examination of any object—get the light adjusted correctly and the focus right and then if possible have a note book to record your observations and to make drawings of what you have seen. You will thus be entering the field of scientific research in a fitting manner. A later article will tell you how to prepare and mount some interesting objects on to slides ready for observation.

An unusual piece of work to undertake is this 8in. tall

MODEL POTTER'S WHEEL



THIS rather unusual model, suggested by a reader, may prove an interesting piece of work. The framework is of fretwood, ¼in. thick, the same wood being used for other parts except those which cannot be made successfully and are better purchased. These parts are a pair of Meccano ⅞in. bevel wheels, and three collars of the same type, with a few inches of ⅛in. metal rod for spindles.

Make the stand first. This consists of two sides, a base, and a top. Patterns for the two former parts are given in Fig. 1. (A) is the sides. Cut two of these to shape and dimensions, making the tenons 1in. long, and ½in. apart for the bottom pair.

In the one for the left-hand side glue a 1in. strip of the fretwood down the centre, as shown by dotted lines, and at the spots indicated drill holes for the driving wheel and upper spindle carrying the pulleys and bevel wheel.

That for the driving wheel is ¼in. diameter and that for the upper spindle ⅛in. In the right-hand side drill the ⅛in. spindle hole only, and get both these holes truly in alignment by careful measurement. The base (B) is cut to dimensions given, and then the mortise slots sawn out to fit the tenons of the sides.

The top of the stand is shown at Fig. 2. It is the same length as the base and has the mortises sawn out to fit the top tenons of the sides. A side view of this top is given to explain more fully the following details. Firstly, glue the sides to base and top, then, when the glue is hard, cut two ¼in. strips of the fretwood, to a length to fit between the sides of the stand, and glue them underneath the top, one each side. Cut a piece of the wood 2ins. wide and 2½ins. long.

Table Action

In the centre of this drill a ⅛in. hole, then glue this across the strips underneath, exactly in the centre of the stand. In the centre of the top drill a similar hole. Measurements being correct, these two holes should be truly in line, and care must be taken to see they are, as they form the bearings for the vertical spindle carrying the rotating potter's table.

Now cut a ½in. wide strip of the fretwood and glue and nail this between the sides and the base, right at the back edge of the stand. This completes this part of the model, and it would be a good idea to clean it up with a rubbing of glasspaper, and then to paint or enamel it whatever colour decided upon. Grey would be a pleasing choice, unless something a little more brilliant would be preferred if the model is for a young boy.

Driving Wheel

The driving wheel, Fig. 3 (C) consists of a pair of fretwood discs, glued together, and bored through with a ¼in. hole. The smaller disc is 2½ins. diameter and both should be cut with accuracy. A groove on the edges to hold the belt, can be filed round, using a three-cornered file for the purpose.

In the absence of a lathe, it is a capital idea here, to ensure accurate roundness, to use an ordinary metal drill as an improvised lathe, by gripping the drill in a vice, bolting the wheel on a ¼in. by 1in. brass bolt, and fixing the bolt between the jaws of the drill. With the assistance of an obliging friend to turn the handle of the drill, and holding the file to the edges of the wheel, quite an accurate groove can be obtained in both, little inferior to lathe work.

Rod Fixing

On the outside of the wheel glue a ⅛in. or ¾in. disc of ⅛in. fretwood, to lessen friction against the sides of the stand. In the hole glue a 1½in. length of ¼in. dowel rod, the portion of rod sticking out to pass through the hole in the side of the stand.

For the pitman to act on the wheel, drive partly in a ½in. round-headed brass screw, just ¼in. out of centre. Now try

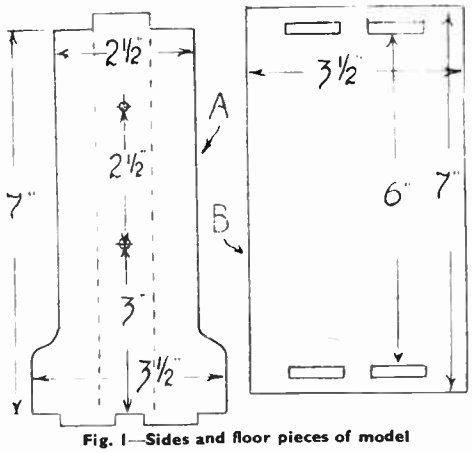


Fig. 1—Sides and floor pieces of model

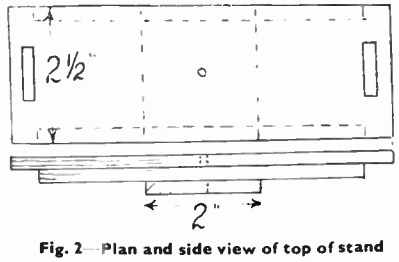


Fig. 2—Plan and side view of top of stand

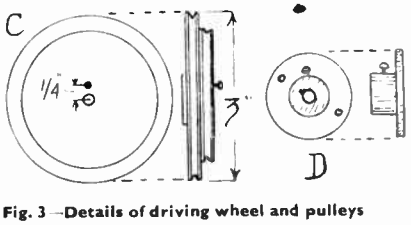


Fig. 3—Details of driving wheel and pulleys

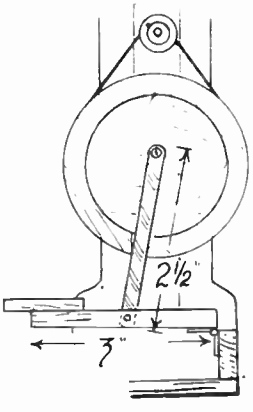


Fig. 4—Driving wheel treadle action

the wheel in place, and glasspaper the hole, if necessary, to ensure the wheel running smoothly.

The treadle, Fig. 4, is a length of the fretwood ¾in. wide. At about the spot indicated cut a ⅛in. slot through, the slot to be 1/16in. or, perhaps, a little more, wide. At the fore-end of the treadle glue a small square of ¼in. wood as a footplate. For the pitman a piece of metal strip, ⅛in. wide is cut. Near each end drill a hole through, that at the top being large enough to take the screw on the driving wheel, and that at the bottom a ¾in. wire nail.

The pitman is held in the slot by driving the nail through the side edge of the treadle, the nail passing through the hole in the lower end of the pitman. Now hinge the rear end of the treadle to the back strip, glued to the base of the stand, in the correct position for the pitman to nearly, but not quite, touch the driving wheel. Remove the screw on the wheel, pass it through the hole in the pitman, and then rescrew it in place. See the whole works smoothly.

An ⅛in. metal spindle will now be wanted, long enough to pass through the upper holes in the stand, and reach across. This is to carry the pulleys which connect with the driving wheel, also the bevel wheel mentioned. The construction of the pulleys is identical with that employed for the driving wheel. One is ⅝in. diameter and the other ⅞in. glued together, with an ⅛in. hole drilled through both.

To fix these to the metal rod, obtain a ¾in. disc of sheet metal and sweat it to a Meccano collar, as at (D) in Fig. 3. Drill small screw holes in the disc, and continue the hole in the collar through the disc as well. Now screw the disc to the larger of the pulleys.

From the left side push the rod through its bearing holes, threading on it in turn, the pulleys, the bevel wheel, and a second collar. Fix the pulley, and right side collar, to prevent the rod slipping, or riding sideways. Now connect the driving wheel to its pulley above with a strong elastic band, and see the works respond smoothly when the wheel is turned.

The vertical spindle is a ⅛in. metal rod. Push this through the hole in the top of the stand, and fix the second bevel wheel on it, at the bottom. Adjust the position of the bevel wheel on the spindle below until both mesh satisfactorily.

Cut off any surplus of the vertical rod, allowing it to stand above the top about ¾in. Take the third collar, and sweat a metal disc to it as done for the pulleys. Fit this to the top of the spindle. Now cut a 2in. disc of fretwood and screw the disc on the collar to the centre of the wood disc, underneath.

As it is unlikely that the model will work smoothly by movement of the treadle, glue a circle of fretwood, say, 2ins. diameter to the wood rod, extending outside the stand, and drill the disc near the edge for a 1½in. length of similar rod, which can be glued in as a handle.

Finish the model by painting the remainder, except the top and rotating disc, which are better left plain. A spot of oil on the bevel wheels will help to ease the works, the holes in the sides can be best lubricated with a little graphite paste, a job done before the driving wheel, and spindle above, are finally fitted.

Some tips about the importance of correct

MARKING AND MEASURING

IT is surprising what a difference good marking and measuring can make to a job. The accuracy of joints is, of course, very dependent on the marking out, but have you ever thought that the appearance of a joint in wood can be affected by the way it is marked? It can, as you will see. Here are some of the rules that good woodworkers follow.

First, using a knife before sawing. When marking for a saw cut, as in tenons, trench joints, etc., when you have fixed the position of the saw cut, mark it with a marking-knife. This cuts the fibres of the wood and prevents them being torn out by the saw teeth. In fact, many craftsmen say "knife your saw marks and pencil all others".

A tenon shoulder and trench joint are usually marked with the aid of a try-square. Think, before using the square, of the shape of the marking-knife blade. It has a V-shaped edge and will leave a V-shaped cut. Therefore, put the blade of the square resting on the part of the wood to be left exposed and cut into the waste side, as in the diagram.

This will prevent leaving a little valley where the two pieces of wood meet each other, which makes a difference to appearance. You can give the saw a start by knifing deeply and then chiselling some of the waste away, as in Fig. 1.

Another thing to watch is the use of the rule. Generally speaking, it is not wise when marking joints to put the end of the rule against the edge of the wood. The black markings are far easier to sight against the edge of the wood.

If you are marking a line, say, 3ins. from the end of the wood, using the try-square, put the end of the rule against the blade of the square and slide it along until the 3in. mark is in line with the end. Press the square firmly and mark your line, not forgetting to put your knife or pencil well into the angle where the blade meets the wood.

The marking gauge, used for making lines parallel to the long edge of the wood, should always be used with the grain and not against it, because it might catch in the grain and run off its true course.

For some awkward little jobs in marking you have a good friend in your penknife. Its slender blade can reach some tight corners. For instance, good dovetails have nice thin pins on them and the penknife is handy for getting down between the dovetails when marking out (see Fig. 2). This is much better than using a scriber which gets caught in the run of the end grain.

You have another example to follow in Fig. 3. If you mark the waste pieces of your wood with crossed lines immediately they have been marked you reduce the danger of cutting on the wrong side of the line.

Equal lengths, such as a set of table legs, should always be marked together, clamped up in alignment. For an experiment, try marking 12in. lengths separately on three or four pieces of wood. Then put the pieces side by side and see if they meet exactly.

If they do, you have an exceptionally good eye for accuracy! Always, if you can, mark equal lengths together, but if the pieces cannot conveniently be put side by side, then set a pair of dividers to the correct distance and use them as a gauge.

One last thing: Keep the pencil, dividers, and all other marking tools very sharp.

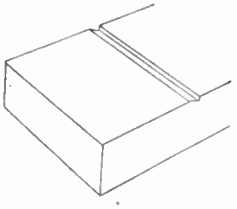


Fig. 1 — A knife cut before starting to saw

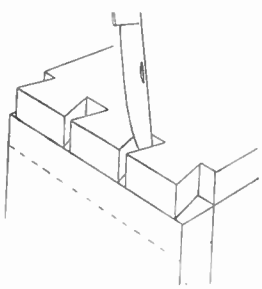


Fig. 2 A penknife is useful for cleaning dovetails

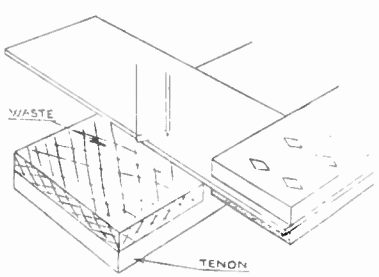
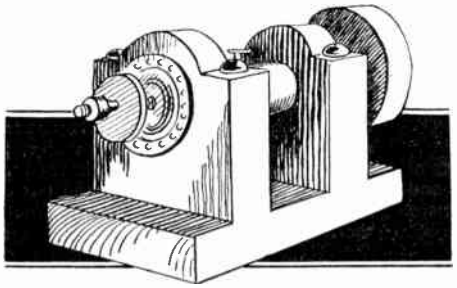


Fig. 3 — Marks to show waste wood, prevents cutting danger

For emery work or buffing you should assemble a BALL-BEARING WHEEL



ALTHOUGH this emery wheel and buffing unit is made entirely from scrap, it is, nevertheless, as reliable as an expensive precision-built job. It is capable of a heavy load at very high speeds, and the bearing adjustments are such that frictional loss is reduced so that good output can be obtained from quite a small driving motor.

The main mechanical part of the unit is nothing more than the hub of a bicycle wheel. Of all items which find their way to the scrap heap or rubbish dump the discarded bicycle wheel seems easily to take first place, and there should be no difficulty in getting a suitable hub.

It matters little how bent or buckled the wheel is generally, as the rim and spokes are not needed and are cut away. Either wheel, front or rear, can be used, but the rear wheel, with its slightly longer spindle, is preferable.

The wheel can be dismantled quickly by cutting through all the spokes with wire-cutter pliers, and the short butt ends can be pushed out easily without a lot of tedious unlacing. The freewheel or sprocket which will, of course, have to be removed before the spokes can be taken out, need not be refitted as it is not necessary in the final assembly of the unit.

The stripped hub should be put into a jam jar or tin and covered completely with paraffin to free it of hardened grease and grit. After a thorough soaking completely dismantle the hub, unscrewing cones, locknuts and removing balls and spindle. Clean each part until it is bright and shining, with no speck of spent grease or dirt, and reassemble the hub, dry.

Adjust the loose cone very carefully so the spindle spins freely, but without noticeable side-play or shake. Make the adjustment permanent with the cone locknuts. It is not likely that the plating of the outside hub shell will be in very good condition, but this can be remedied by giving a coat of enamel.

This can, of course, be any colour, but it will give a more professional finish to the completed unit if the shell is painted a bright red similar to that which is used on small machine castings.

The wood used for the bed block and bearing supports is 1in. thick. The dimensions given in the diagrams are those used in the mounting of a rear hub of standard design, but it is possible that the hub which is available may vary slightly in overall width or diameter, and the measurements will need to be modified accordingly.

Although the woodwork of the mounting is very simple, the greatest possible care should be taken in cutting and finishing to ensure that the bearing supports stand perfectly square on the base block, and the hub must fit in the exact centre of each support.

As the measurements will be determined by the size and design of the available hub, it is best to begin by making the vertical supports. These should be cut solid from 1in. thick wood and finished accurately so that both pieces are identical in every measurement, particular care being taken to see that the bottom edge is properly squared (Fig. 1).

With a pair of callipers or two blocks of wood, measure the exact diameter of the middle of the hub barrel. If the hub is of the type in which the barrel is expanded at each end inside the spoke flanges to accommodate the ball cups, it will be necessary to measure also the diameter of the expanded portion. With the point (A) in Fig. 2 as the centre, mark circles to correspond with the hub diameters, and through the centre of the circles mark the line of division (B).

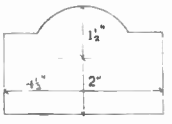


FIG 1

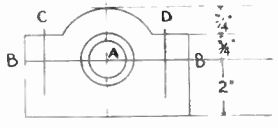


FIG 2

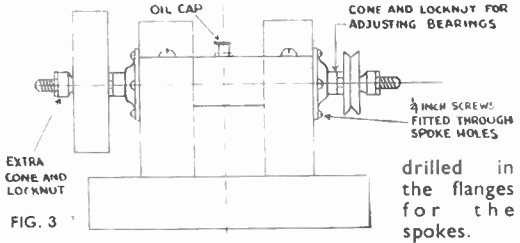


FIG. 3

The inner circle is cut out with a fretsaw and finished with a half-round file. The outer circle has to be taken out for a depth of about ¼in. only, just sufficient to allow the expanded ends of the barrel to seat in snugly. This is best effected with a small chisel.

Drill holes at points (C) and (D), and fit 1½in. screws. The screws may be either round-headed or countersunk, and after being fitted they should be taken out again temporarily so that the support may be cut in two at the division line (B). It will be seen that the screws having already been fitted, it is possible to clamp the pieces together without the risk of inaccurate register.

The hub when laid across the two lower halves should drop neatly into position, with the spoke flanges flat on the outside faces, and the spring-lid oil cap uppermost. Any slight imperfections should be remedied with a file or small chisel before fitting the top sections. The top halves, too, should fit easily so that when the screws are refitted the two sections are brought tightly together in the form of a clamp round the barrel of the hub.

The effect of the saw-cut at (B) will have reduced the vertical diameter of the circles slightly, but if the hub is not gripped tightly when the screws are put in, a thin shaving taken off the sawn edges will take up the slackness.

The base block is the same in width as the upright supports, and it should be sufficiently long to allow a 1in. extension beyond the uprights (Fig. 3).

Holes are drilled 1½ins. from each end and countersunk on the underside to take the four 1½in. screws which fix the vertical supports to the base block. The screws should be screwed tightly so that the uprights are held in position perfectly square and rigid.

To prevent any creeping of the hub when used under load at high speeds, the spoke flanges are fixed to the outer faces of the supports with ¼in. round-headed screws. Six or eight of these may be put in at each end, spacing them equally in the holes which are already drilled in the flanges for the spokes.

The driving pulley is made up of two discs 1½ins. in diameter, and cut from ¼in. wood. Each disc is bevelled on one side and drilled with a ½in. hole in the centre. The bevelled faces are put together to form a V and are locked tightly together on the spindle between a cone locknut and a spare loose cone.

The object of this extra cone is that its tapered face engages inside the over-size hole of the pulley, and on being tightened the pulley is automatically centred on the spindle (Fig. 3). Cones and locknuts should be used also for fixing the emery wheel and buffer, or any other fittings which may be employed on the spindle.

This automatic centring action of the cones helps considerably in the smooth running and precision of the completed unit, especially when it is used at high speed. Fine adjustment to the ball-bearings, and the easy lubrication by means of the spring-lid oil cap ensure the maximum output from a small driving motor.

Some odds and ends can easily be converted into

A MODEL STEAM-ROLLER

WE have all seen the fascination with which a child watches the steam-roller at work repairing the roads. How thrilled he would be to possess one of his own! This sturdy wooden model is easily made, and will stand up to much rough handling.

The materials required are two 5½in. diameter wooden wheels, a block of wood 7ins. long by 3ins. wide by 3ins. deep, a 2in. diameter wooden rolling pin, a piece of wood 7ins. long by 3ins. wide by ⅜in. thick, four mild steel rods ¼in. diameter, threaded at one end with nuts to fit, a piece of ¾in. tubing 7ins. long, an 8in. strip of mild steel ¾in. wide by ⅛in. thick, a short length of chain with screw eyes, a ¼in. bolt 4½ins. long and some coach screws and washers.

On top of the block of wood and ¾in. from the rear end, cut out a 2in. square hole, about 2ins. deep. This is best done by boring a ¾in. hole in each corner and squaring with a chisel to form the driver's compartment. At the front end of the block bore a hole 1in. deep and ¾in. diameter. The centre of this hole should be ⅝in. from the top and 1½ins. from each side of the block. Square the hole to just under 1in. each way with a chisel.

The Boiler

The boiler is made from part of the rolling pin. Cut off the knob at one end, then saw off a piece 5½ins. long. On the end of this section mark the centre, and then a square 1in. each way. Cut down these lines to a depth of 1in. with a fine tenon saw and, holding the wood in a V block or vice, saw off the surplus, leaving a tongue of wood 1in. square on the end of the boiler. If this has been done carefully, the tongue will fit tightly into the hole in the front end of the body of the model. Glue and fix into position.

Canopy

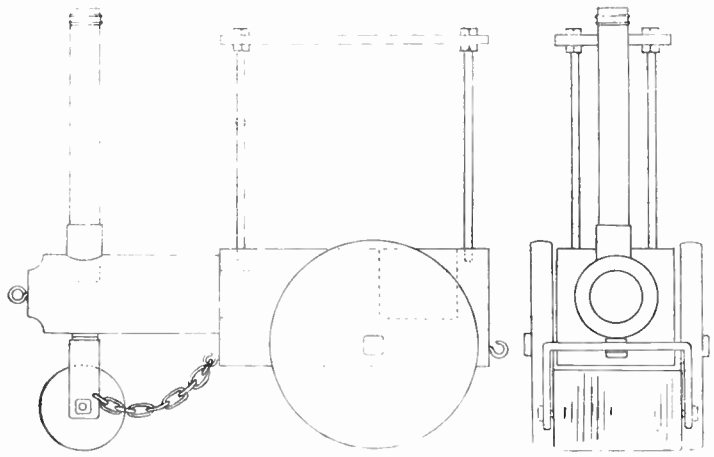
The canopy is made from a piece of wood 7ins. long by 3ins. wide by ⅜in. If plywood is used it need be only ¼in. thick. A distance of ½in. from each corner drill a hole ¼in. diameter (four in all). Using this wood as a template, place it on top of the body and mark the position of the holes. Then drill four holes 3/16in. diameter and ½in. deep in the top of the body to take the stay bars.

These stay bars are made from the mild steel rods 6ins. long and ¼in. diameter. Cut a thread ½in. long at one end of each rod, and fit two nuts to each. Most ironmongers or garages will supply these rods, and cut the threads if required. Put a nut on each rod as far as it will go and push the rods through the holes in the canopy, afterwards screwing up the second nut.

Now drive the four stays into the holes in the body, taking care to drive each one in a little at a time. The reason for this strong support is that a child puts most of its weight on to the canopy when pushing the model.

Chimney

The chimney is made from the piece of ¾in. diameter tubing. Close to one end solder on a ferrule, or bind a few turns of ⅜in. insulating tape round the tube. Mark 1½ins. from the front end of the boiler, and bore a ¾in. diameter hole on the top centre, to a depth of ¾in. Force the chimney into this hole, and glue in position if necessary. A few layers of insulating tape bound round the chimney to a height of 1in. above the boiler greatly adds to its appearance.



A helpful side and front view of the parts

The Road Roller

To make the roller cut a section 3¾ins. long from the rolling pin. Carefully drill through the centre a ¼in. hole to take the spindle. When drilling long holes, it is advisable to use a small diameter drill first, and rebore afterwards with a drill of the required size.

The gamble which carries the roller is made from a piece of mild steel, 8ins. long by ¾in. wide by ⅛in. thick. In the centre drill a hole 5/16in. diameter. At a point 2ins. from each end bend at right angles, to form three sides of an oblong. Drill two more holes 5/16in. diameter, one in each limb of the gamble ½in. from the end. Make sure that the spindle, when passed through the holes, will be parallel with the top of the gamble. Finally drill a hole ⅛in. diameter in each limb, ⅛in. from the edge and 1in. from the bottom, for the chains to hook into.

Fix the gamble to the underside of the boiler with a 1½in. by ¼in. coach screw, drilling an ⅛in. diameter hole in the centre of the boiler, 1½ins. from the front end. Screw the gamble into this hole, putting one or two washers between it and the boiler.

Now push the 4½in. bolt through one limb of the gamble, fit a washer, pass the spindle through the wooden roller, fit another washer, pass the bolt through the other side of the gamble and put on a nut. See that the roller spins freely, then tap over end of thread with hammer to prevent nut working loose.

Fix two screw eyes into front end of the body and loop a piece of chain from the ⅛in. holes in the gamble to the body, so that the roller can turn about 1in. each side of its centre position.

Now fit the driving wheels. Drill a ⅛in. diameter hole each side of the body, 3ins. from the rear end and ¾in. from the bottom. Drill the wheels to take a ¼in. coach screw, making the hole very slightly larger, and fix in position with a washer between each wheel and the body. The coach screws should be 2ins. long.

Finishing

The model can now be glasspapered and painted. Aluminium paint for the driving wheels, roller and gamble, dark green for the body and boiler and black for the remainder. The driving wheels can be removed for painting and when finally fixed, a spot of glue on each coach screw will prevent it working loose later. If a small screw eye is fitted, one on the front and one on the rear, string can be attached to pull the model along, or for it to be hooked on to others.

In painting it is best to give a first coat of priming paint, which can be flat grey or of white. Let this get thoroughly hard before adding the second coat, laid on evenly and without drag.

Home Cements for Special Jobs

Cement for Jointing Hot-Water Pipes

This cement contains—by weight—80 parts of crushed iron filings, 2 parts of flour sulphur, and 1 part of powdered sal ammoniac; which ingredients must be well mixed dry, and then moistened with water some two hours before use. The pipe joint is first caulked a little more than half full with yard or old sisal string and then finished off with the cement. As the cement expands a little in setting, the caulking should not be carried out too solidly.

Cement for Fixing Letters to Glass

In cementing enamel or glass letters to windows, first dust french chalk over the glass, then coat the backs of the letters with a cement made some twelve hours previously from equal parts of white lead and the best gold-size; spreading the cement on to a thickness of at least $\frac{1}{8}$in. Press the letters well down, and scrape the excess cement from around them.

Another quicker-drying cement for the same purpose can be made up by mixing together 1 part of white lead, 2 parts of litharge, 3 parts of boiled linseed oil, and 1 part of copal varnish.

China to Metal Cement

The following cement must be kept in a tightly-closed bottle and is useful for uniting china to metal. It is made by mixing 20 parts of rosin, 1 part of boiled linseed oil, and 2 parts of plaster of paris. It should be heated before use.

Adhesive for Fixing Gold-leaf to Glass

Weak isinglass dissolved in rain-water is the best adhesive for this purpose, for the cracking and chipping due to the use of japan or gold-size is because these adhesives contract and expand to a large degree with temperature changes. The glass should first be painted with a 'backing' of red-lead, ground in varnish and thinned with pure turpentine.

Cement to Withstand Oils

A cement to fulfil this requirement is made by dissolving 1 part of caustic soda in 5 parts of water, and boiling with 3 parts of rosin till all are dissolved; finally adding about half the entire weight again of plaster of paris or chalk. It must be used at once, as it hardens very rapidly. This cement will take the place of either red-lead or white-lead cements.

Common soap or glue are also excellent lutings to use where the action of oil has to be withstood.

This pattern is to be pasted on to a piece of thin plywood or plastic sheet, or a tracing of the outline transferred. Cut away the unshaded parts only. The pattern is then cleaned off and further details added with a pencil. For full instructions, see page 360

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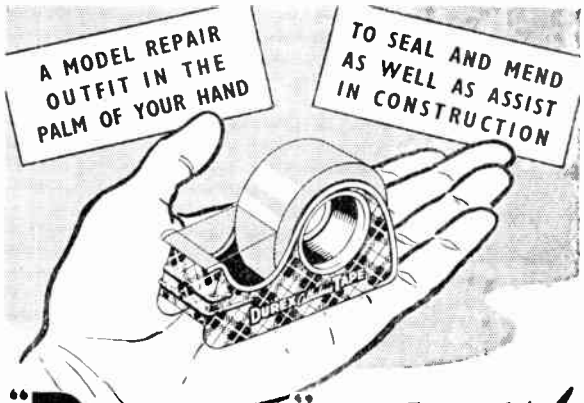

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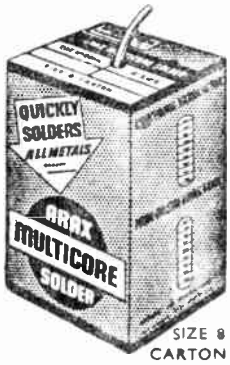

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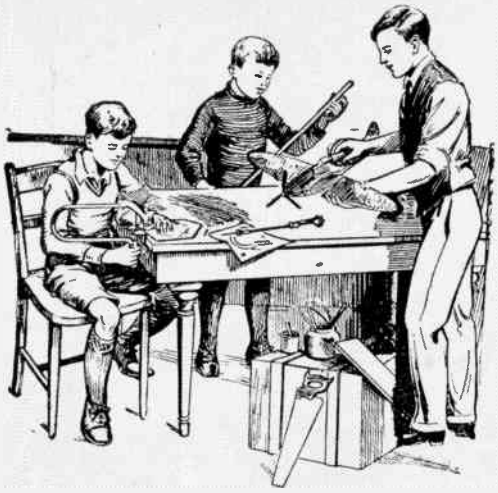

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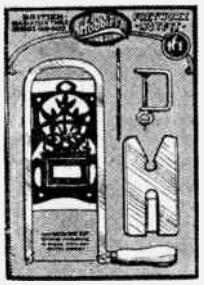

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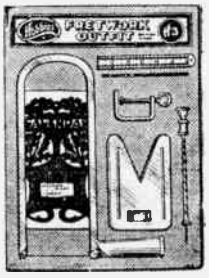

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Hobbies WEEKLY

CONTENTS

March 15th, 1950 Price Fourpence Vol. 109 No. 2837

How the handyman should undertake

RUSTIC WOODWORK

RUSTIC woodwork is peculiarly suitable to the garden, and as the wood can mostly be obtained for the trouble of cutting, or at the most very cheaply, it is an economical form of decorative work. The example chosen for this article combines a simple archway, with side fences, just the thing for fixing at the entrance to your garden, or dividing the flower portion from the vegetable plot.

For construction, about the easiest plan is to make the wing pieces first, as drawn in Fig. 1, and to connect them together, as in the finished drawing, to make the archway centre.

Varying Dimensions

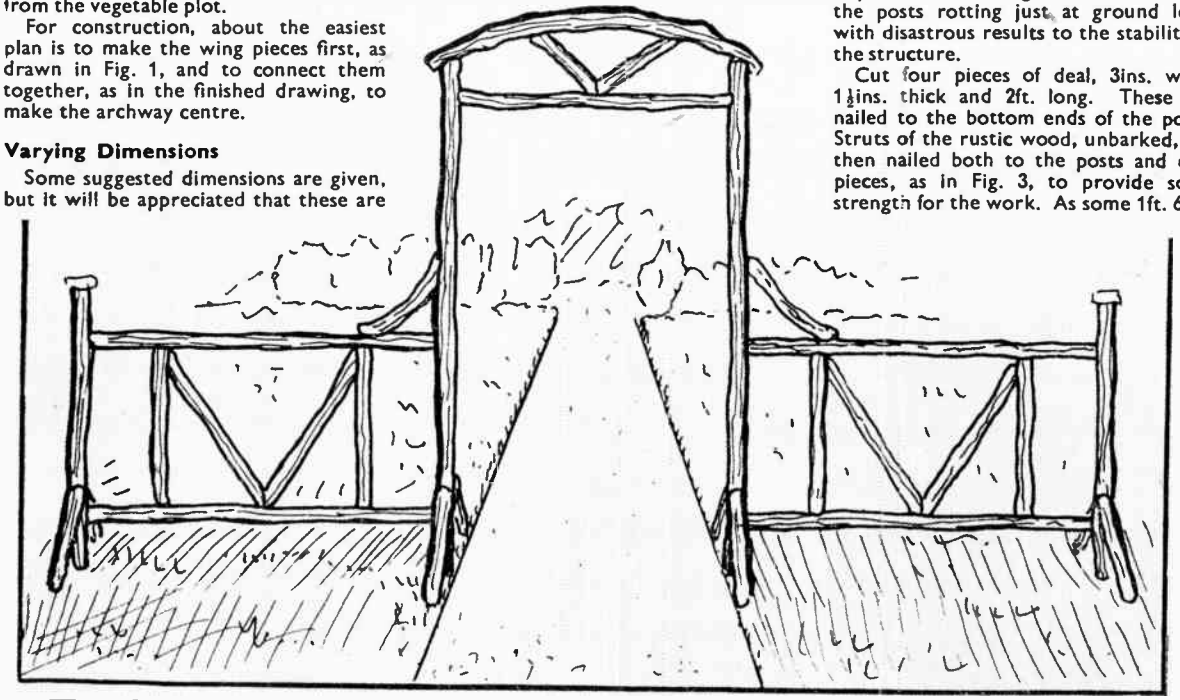
Some suggested dimensions are given, but it will be appreciated that these are subject to such amendments as space in the garden may dictate. The line (G.L.) indicates the ground level. From this it will be seen that the long and short end pieces of the wings are cut 1ft. 6ins. longer for insertion in the ground.

These pieces can be cut from rustic wood, 2½ins. diameter or thereabouts, no need to be too particular about this. Choose lengths as straight as possible for these parts. The wood can be left unbarked, as preferred, many may prefer the wood in this state, as it looks more natural.

Ground Work

Those portions to be sunk in the ground should be stripped of bark, allowed to dry, and be well creosoted as a preservative against rot. This is most important, and if neglected will result in the posts rotting just at ground level with disastrous results to the stability of the structure.

Cut four pieces of deal, 3ins. wide, 1½ins. thick and 2ft. long. These are nailed to the bottom ends of the posts. Struts of the rustic wood, unbarked, are then nailed both to the posts and deal pieces, as in Fig. 3, to provide some strength for the work. As some 1ft. 6ins.



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of these portions are to be embedded in the ground, well creosote to that distance up.

Cut the horizontal rails from 1½ins. to 2ins. wood. The ends of these should be roughly chiselled to a curve to fit the posts, then the rails are firmly attached to them with a coach screw in each joint, as in detail (A) in Fig. 4.

Coach screws 4ins. long should be used and holes large enough to allow them entry should be bored in the posts, with smaller holes in the ends of the rails for the threaded parts to cut their way in. These screws are provided with square ends, and are forced in with a spanner or large pair of pliers.

The vertical and diagonal rods between the rails are cut from slightly thinner stuff than the rails, trimmed at their ends to fit somewhat the curves of the rails and nailed in place. The verticals can be nailed straight through the rails, using long rails of the cut iron kind, as at (C).

It will be safer here to bore preliminary holes in the wood, a trifle less than the thickness of the nails, especially through the rails, to avoid danger of splitting the wood. The diagonals can be nailed or screwed as preferred, in the manner indicated at (B).

Note how the ends are bevelled off to facilitate the entry of these nails. A little forethought here will render the job much easier. Finish the top ends of the shorter posts by nailing a square capping of deal over.

The position of the wings can now be determined. Generally they will be placed either side of an existing pathway. Dig holes 1ft. 6ins. deep for each post, and 2ft. 6ins. long. Now drop a few small stones in each hole and ram well down to firm the foundation. Drop the posts in their respective holes and shift, as may be necessary, to get the long posts exactly opposite each other.

The posts can now be connected together by a cross rail, some 4ins. from the top. A coach screw joint will be best here. For the topmost rail, choose a piece of rustic wood with a natural curve, long enough to straddle the posts and extend 1in. or 2ins. either side. At the ends, where they will rest on the posts, saw out rightangled notches, for them to 'sit' flat on the squared ends of the posts, then nail them on.

The work can be completed with the addition of the two slanting pieces at top and the shorter curved pieces in the angles between the wings and posts. Naturally curved pieces of the rustic wood should be chosen for these and they can be screwed or nailed in position, as in detail (B).

Fill in the holes with earth, mixed with a few small stones. Well ram the stuff down, then the whole structure should be firm and stable.

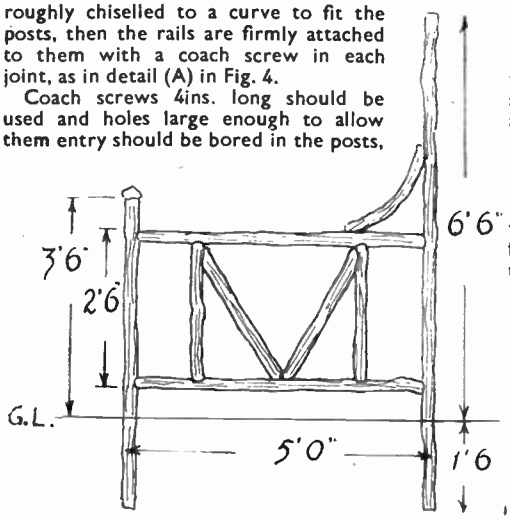


Fig. 1—View of side railing with ground level

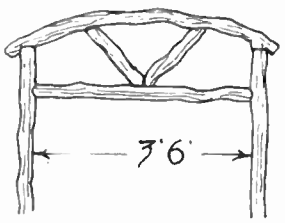


Fig. 2—The top of the archway

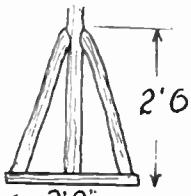


Fig. 3—Post supports

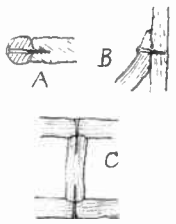


Fig. 4—Section showing joints

More Simple Home Cements

Casein Glue

CASEIN can be converted immediately into an excellent glue by stirring it up with 25 per cent distilled water and 1⅛ per cent sodium bicarbonate, adding another 25 per cent distilled water, standing for 6 hours and adding an antiseptic to prevent it going mouldy. This glue should be applied cold.

Waterproof Cements

CANADA balsam is an excellent waterproof cement much used in microscopy as it is transparent and adheres to glass. It may be thinned by the addition of a little xylol or benzol (not benzine).

Another similarly constituted cement which is not quite so flexible when set may be made up by dissolving ½oz. each of gum sandarac and gum mastic in ½ pint of methylated spirit afterwards adding ½ pint of turpentine and 1 pint of strong, hot scotch glue or isinglass.

Cement for Fastening Card to Ironwork

FOR this special purpose there is nothing to rival an adhesive made by stirring a 30 per cent solution of gum tragacanth in water till it emulsifies and then adding four times as much strong solution of gum arabic in water. This mixture is then filtered through muslin and as much glycerine as gum tragacanth added, together with a little oil of thyme or cloves, as a preservative. This mixture, diluted, makes a very adhesive cement which should be kept in airtight bottles.

India-rubber Substitute and Cement

THE addition of equal quantities of sodium tungstate and spirits of salts (hydrochloric acid) to a strong glue solution, will, when heated to 60 degrees Centigrade, produce an excellent substitute for rubber. It may also be used for uniting substitute rubber.

Cement Made Insoluble by Light

SOAK 6 parts of scotch glue in water, and, when soft, pour off the excess and add to the swelled glue (melted by heat in a glue-pot) 1 part of bichromate of potash which has been dissolved in the smallest amount of water possible. The cement so formed must be stored in a blue bottle or kept in the dark until used as parts cemented with it become hardened and the glue completely insoluble in water.

Asphalte Cement (Solid)

A VERY useful workshop cement with many uses may be made by dissolving 1 part of raw rubber in 12 parts of benzine, naphtha or carbon di-sulphide with the aid of very gentle heat over a water-bath. When the rubber is completely dissolved, 2 parts of asphalt is melted in an iron pot and the rubber solution very slowly stirred in until the mass is homogeneous and the rubber solvent has evaporated. The syrupy mass is then cast into greased tin moulds.

This cement needs considerable heat to render it usable (about 300 degrees Fahrenheit) and the edges being joined should also be made quite hot for a good joint.

Linoleum Paste

MIX rye flour with a little cold water, afterwards adding boiling water, stirring the while; finally adding some glue-size while both the paste and glue are hot. A little alum should be added to prevent the paste going mouldy. If too thin, some of the water should be evaporated by boiling.

A novel little mechanical model to make is this

FAIRGROUND WHEEL

HERE is a simply-made wood and card model of the Ferris Wheel you see in amusement parks at the seaside. A series of seats are suspended at intervals round the circumference of this 'ride' in which the passengers sit and which, by virtue of their weight and method of attachment, always remain vertical no matter what their position on the circular path described by the rotating wheel.

In the model given here the seats are match-box trays cut in half and all dimensions are worked out to this. First let us make the seats. Four match-box trays are required of the card type which are carefully cut in two with a sharp blade at their mid-points. This

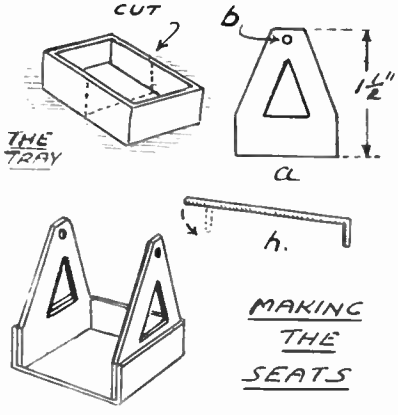


Fig. 1 —Details of seat construction

gives eight half-trays as shown. Fairly new boxes should be chosen, as the card in this kind of match container becomes rather limp with use.

Now cut sixteen shapes (a) Fig. 1 as shown, from a fairly thin card and make a small hole (b) in the top of each by touching with the end of a red-hot knitting needle. This produces a cleaner hole than any other method. Glue two shapes to each tray which will give the completed seat as indicated.

The Wheel

The wheel is built up of the two discs (c) of 7ins. diameter and the central spaces (d), which can be a cotton reel of suitable size. Plywood ⅛in. thick is quite suitable for the discs, which are first marked but as (1) Fig. 2, with two diameters at right-angles and then two more again at right-angles.

The extremities of these give the positions at which the seats will hang and after the diameters are drawn a point ½in. in from the circumference should be marked in each. A small hole is drilled here which will take the lengths of wire (h), Fig. 1, from which the cars really hang.

Continue scribing, and now draw in the four spokes as shown and then with a fretsaw take out the space between them so a wheel or disc as indicated in the second sketch is obtained. Two of these discs are required and special care must be taken in getting the holes for the wire in the same position on both. In fact, it is best to drill the holes on one disc and then placing it over the other, mark through and drill the second disc at the point so obtained. If the holes are not really opposite each other the seats will not hang level, nor swing properly.

The middle space (d) must be 2ins. wide and the discs are attached at either side by two small screws and glue, making sure of the alignment of the holes. Once together, openings the size of the central hole of the reel are taken out of the middle of each disc, a countersinking bit being useful for this if you have one. Otherwise the holes can be reamered out in several ways.

Once made, a length of dowel (g) which just fits the central channel of the reel is forced through—the tighter the fit the better—and glued.

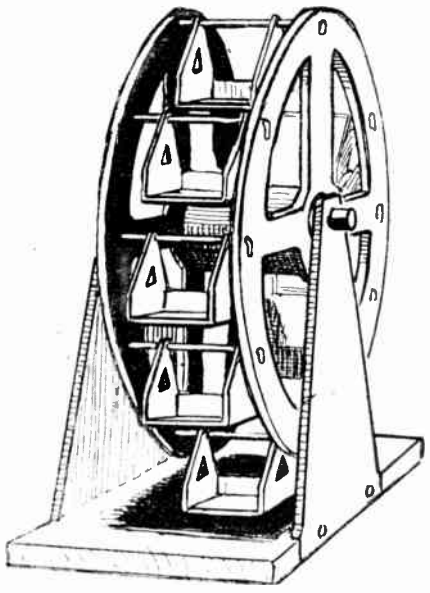
Side Supports

Now comes the side support. The base is a simple rectangle of wood 7½ins. by 3½ins. and the two uprights are 6ins. high and shaped as shown. Holes the same size as the dowel are taken out at the top. To fit, the one upright is just put in position, using two screws along its lower edge.

The wheel is then put in position and the second upright secured. To make running easy and to act as spacers, metal cycle or other washers are put on the axle either side of the discs. These washers should keep the wheel about a ½in. away from the uprights.

Test for smooth turning and then put on the seats. Sixteen short pieces of soft wire 2½ins. long are needed for these. Turn down the end of each to right angles with a pair of flat-nosed pliers and feed each through the corresponding holes in the discs and the top holes of the seat arms. Carefully now bend down the other end of the wire which will not be hard if a soft wire is used. Stiff wire must be avoided.

Trim off the dowel, but leave a little protruding at one side to rotate the wheel with, and



the Ferris Wheel, constructionally at least, is complete. Colouring can be ordinary paints of any bright hues. Say pillar-box red for the wheel itself, yellow for the seats and green for the base and uprights.

On Test

If all has gone well the wheel should now turn easily and the seats remain always hanging vertically. The general appearance can be improved if it is possible to get hold of some tiny figures, as, say, from toy motor cars. There need not be a figure in each car, but they must balance. That is, if there is a figure in a seat at one side, then there must be one in the corresponding seat at the opposite side.

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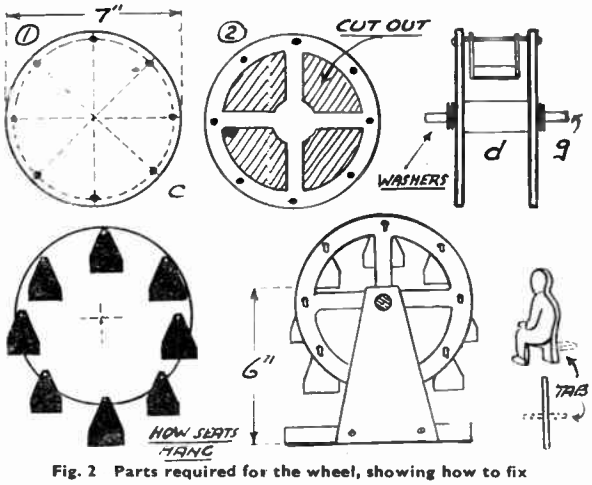


Fig. 2 Parts required for the wheel, showing how to fix

Add to the realism of your miniature railway with MODEL EMBANKMENTS

EMBANKMENTS are both interesting and useful to have on your model railway, no matter whether the line is an indoor or garden layout. On inside lines they can be made to give variety to the scene and break down any suggestion of monotony that may arise from sets of tracks all on the same level. In garden layouts embankments are often necessary to make up for inequalities in the ground. But it is with the indoor variety that we are dealing here.

Briefly, real railway embankments fall into three classes (Fig. 1)—(1) the wholly wall-retained, (2) the partially wall-retained and (3) the ordinary earth

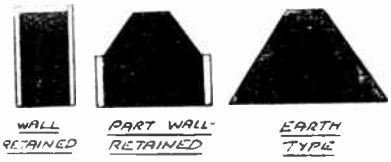


Fig. 1—The three types detailed

type. They are mentioned in this order as this is how they are of most use to the model-railwayist with an indoor line.

In actual practice the situation is reversed, as there are far more ordinary earth embankments about than anything else. Town and suburb-dwellers will see a lot of the wall-retained, however, as in their area land is precious and obviously this kind does not take so much.

In the same way the completely wall-retained embankment is useful for the indoor layout as it takes the minimum of space and can be fitted into places where the semi-walled or 'earth' type would be out of the question.

Walled Embankment

Fig. 2 shows how to construct one of the completely walled. The sides (a) can be strips of thin plywood or even thick card will do if the embankment is not too long. The base is made of blocks of wood at intervals as (b), screws going through the lower edge of the sides into their edges.

Without further aid a single-line embankment of this type would not be firm and so cross-pieces must be put in at intervals as (c). If half-jointed into the blocks (b) there must not be very many of these, one here and there being enough to give all the stability necessary.

To give a neat and realistic finish the sides are continued a little above the level of the top board (where the rails are laid) this being to form a lip to hold ballast in position. To look well the top of any embankment should have ballast, and this can be cork chippings well glued, or pieces of other material.

The sides are finished with stone paper which is sold in large sheets by most model dealers. It is quite inexpensive and glued into position produces a most excellent effect of heavy stonework.

For the type of embankment with a wall at the bottom, cut a number of 'cross-sections' as (D), Fig. 3, out of ½in. or even ¾in. wood. These are set at well-spaced intervals along the course of the length in question and then connected by the top board (E) which takes the rails. Fasten together with long small-diameter screws at the point of contact and then put on the wall (F) a suitably-sized strip of plywood or stiff card. When together, these sections form a very rigid frame.

Paper Covering

The space (K) above the wall is now filled with strong rough-surfaced brown paper. A strip of card (H) is first put in position along the edge of (E) with sprigs and glue and the top edge of the paper turned in being glued to this. As with the first embankment, the card strip is to form a lip to 'retain' the ballast which should come level with the top of the strip.

If scale track is being laid straight on to (E) without sleepers, the card strip can be dispensed with and the brown paper pulled right over the top in one continuous piece to the other side before the rails are pinned down. Glue-painting and then sprinkling with crushed stone is all that is required in this case to give a quite presentable finish.

With tinplate rail or scale track on sleepers, some sort of ballast must be used to get a good effect.

The half-wall can be covered in this case with stone or brick paper, as often these smaller walls are completed with the standard brick.

The 'Earth' Type

Fig. 4 shows how the full 'earth' embankment is made. It is much the same as the previous kind but the cross-sections are the full triangle in shape. There is no need for any under base, for with ½in. or so material and again using long but small-diameter screws, the sections will stand perfectly firmly.

The brown paper here is taken down from the strips of card bordering the top board to the under side of the sections, being held by a drawing-pin and glue at each end. Should the bottom edge of the paper not lie too well, thin strips of wood can be put between the lower points of the sections which give something to wrap the paper round.

Beware of Derailment

In all cases, track on an embankment should be particularly well laid, as a derailment here may cause a whole train to fall some little distance, which can easily damage a heavy model, or at least do no good to the paint-work. Also, do not make the grade up to an embankment too sharp, although a good clockwork engine will tackle quite a slope with a reasonably heavy load. With electric power grades can be steeper.

An indoor embankment should not be laid too near the front of a set of tracks as it can completely hide those behind and so waste their effect. Right back against the wall is a good location.

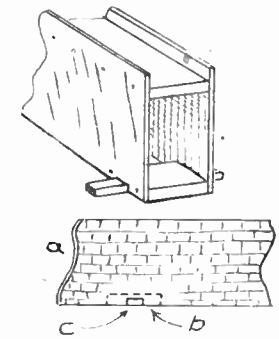


Fig. 2 Walled type

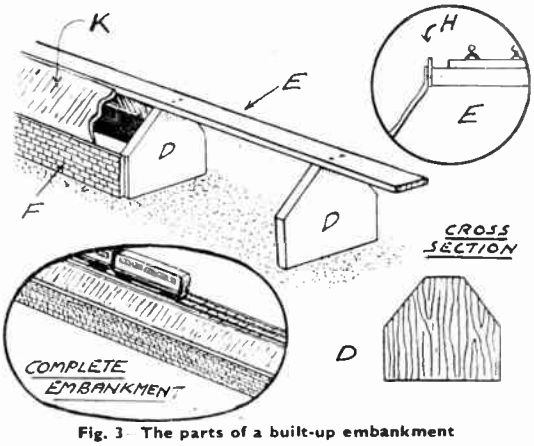


Fig. 3 The parts of a built-up embankment

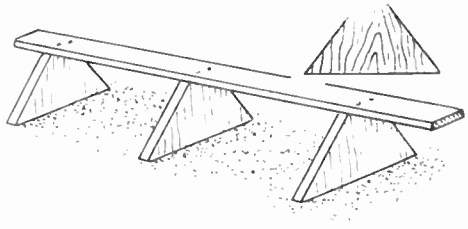


Fig. 4 Making an 'earth' embankment

Two alternative figure designs for decorating

A NOVEL STRING BOX

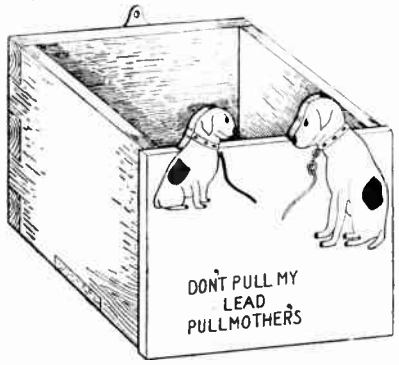


Fig. 1—Box ready to hang

THE novel string box indicated in Fig. 1, of the accompanying illustrations is well worth making, and is bound to be popular in the home. The layout for the box front is indicated in Fig. 2, which is made in wood ¼in. thick. First cut the wood 6ins. square, and divide the surface into ½in. squares. Draw the dog and puppy as indicated, which is quite easily done by following through the squares.

The Extending Heads

The heads of the dog and puppy are cut out to shape, and the top edge of the front squared off along the thick line. A small hole is drilled at points (A) and (B) which allows for string to pass through. A piece of coloured string may be fixed in the hole for the puppy, and knotted in order to make it a fixture, as shown, to indicate the lead for the puppy. The lead for the dog is the end of the ball of string which is in use, and a loose knot is formed after use in order to prevent the end slipping through into the box.

An alternative front for the string box is indicated in Fig. 3, and is in the form of a cat and kitten. Have the wood for this the same size as for the dog and puppy. The outline is drawn in the same manner as already described. The top portion of the heads are cut out, and the edge squared along the thick line as shown. A small hole is drilled at the bottom of the cat and kitten to allow the end of the ball of string to form the tail for the cat, and a coloured blank piece to form the tail of the kitten. More will be said about the finish of the front. In the meantime the other parts of the box are made.

Box Back and Sides

For the back indicated in Fig. 4, obtain a piece of wood ⅜in. thick and cut to size 5¾ins. by 5ins. Carefully cut the tenons on the two ends as clearly indicated, making them 1in. long and ⅜in. deep. In the centre of the bottom edge cut the mortise 2ins. wide and ⅜in. deep.

Two sides are required and these are indicated in Fig. 5. Have the wood ⅜in. thick and cut to size 5¾ins. by 5ins. Cut the tenons 1in. long by ⅜in. deep on the end of the side pieces which will be the back edge. In the position 1⅞ins. from the front edge, cut the mortise on each piece 2ins. long and ⅜in. deep as clearly indicated. Care should be taken with the cutting of these joints in order to get a good square fitting box.

The bottom of the box is shown in Fig. 6, cut in wood ⅜in. thick. First make the wood to size 5¾ins. square and in the centre of the edge which will be the back edge of the box, cut the tenon 2ins. long projecting ⅜in. On the two side edges of the bottom 1⅞ins. from the front edge cut the tenons 2ins. long and ⅜in. deep.

Having cut the two sides, back, and bottom, fix them together with glue and a few small pins. The front piece is carefully glued on and made secure with a few pins.

Colouring

It now remains to colour the box, when it can be fixed in a chosen position by means of a small back plate in the usual manner. An idea for colouring the dog and puppy front is to have the background cream enamel, with the dog and puppy white and black enamel. For the box made with the cat and kitten front, a nice effect is obtained by solid black enamel cat and kitten with whiskers, on a white enamel background. The remainder of the box may be given a coat of stain.

It now remains to do the printing of the words, and these may be done with suitable letter transfers, or printed with black enamel in the position indicated on the front.

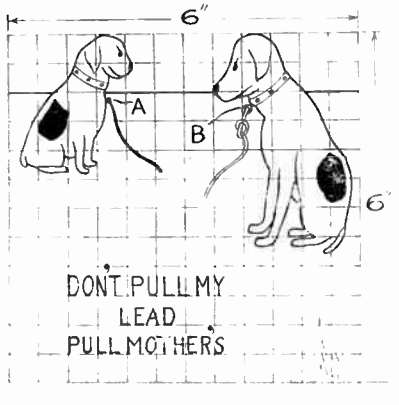


Fig. 2—Outline of dog and puppy

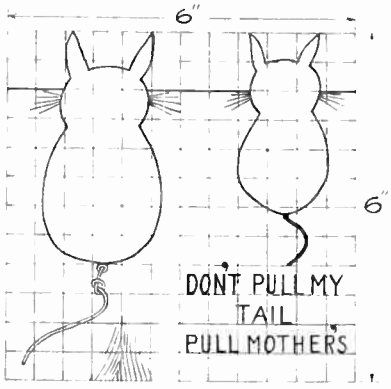


Fig. 3 A simpler back view of cat and kitten

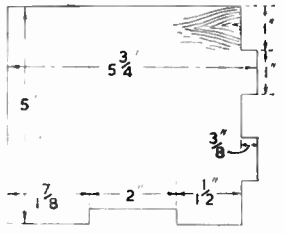


Fig. 4—Back of the box

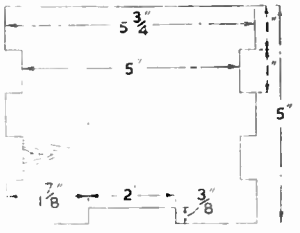


Fig. 5—Two sides like this

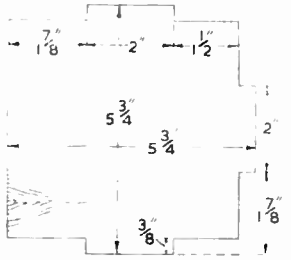


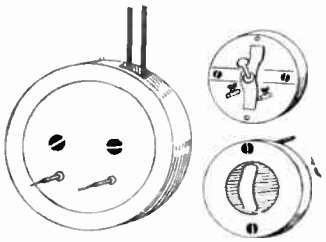
Fig. 6—The box floor

The professional touch is quite easy with care when

FITTING NEW LIGHTS

THE circuit for a new lighting point is shown by dotted lines on the diagram. It should be carried out in 1/064 cable, either rubber or lead covered. This is single wire ·064ins. thick with a capacity of 10 amps. A normal house lighting circuit has 5 amp. fuses and with all lights burning, the current consumed is less than 5 amps. This 1/064 cable, therefore, will stand up to twice the load it is expected to carry and is quite safe.

The circuit is from the live side of an existing switch to one terminal of the new switch, from the second terminal of



The switch assembly

the new switch to one terminal of the new ceiling rose and from the other terminal of the ceiling rose to the live side of an existing ceiling rose.

For each new point to be fitted, a switch, a lampholder, a ceiling rose and two hollow wooden blocks on which to mount both switch and lampholder will be needed, with sufficient cable and a short length of twin flex.

Marking Out

First determine where the new ceiling rose is to be fitted and make a hole in the ceiling big enough to take a double thickness of cable. Then mark the place where the new switch is to be and make another hole in the ceiling again to take two cables.

Above these holes in the ceiling it will be necessary to lift floor boards in the room, and also the board above the nearest ceiling rose already fitted. Some of these boards will be loose since they were lifted for the original installation of either gas or electricity. In a false roof for a bedroom light these difficulties do not exist.

The Cable

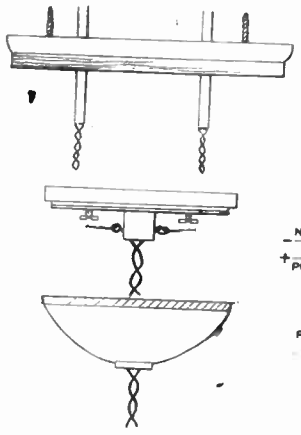
From the nearest existing switch, the new wire is led with the others through the ceiling, along under the bedroom floorboards to where the hole leading to the new switch was made. There it is doubled and the loop pushed through. It is fed through until there is sufficient to reach the new switch plus a few extra inches for connections. Then the cable is led to the hole for the new ceiling rose. Again it is looped through and enough left for connections, when the cable is taken to the old ceiling rose.

Fitting The Switch

First one of the blocks is drilled to take two wires. These holes should be 1½ins. apart, slightly above centre. Holding the switch in place will show the position. Next drill two holes for fixing screws so they will be hidden by the switch. Wall plugs are fitted to take these fixing screws so the block will be quite firm.

The wire loop is cut and the ends bared to fit into the switch terminals, a slot cut in the side of the block to take the cables and then the block is threaded on to the wire and screwed into place.

The switch is next threaded on the wire so the bared ends go through the two holes in the back and into the



The ceiling rose assembly

terminals. They should be pushed home until stopped by the insulation, the terminal screws tightened and any spare wire cut off.

The switch is then screwed to the block and after a check that connections are tight, the switch cover can be screwed into place. Any spare cable outside the switch is fed back through the ceiling.

The Ceiling Rose

Before the ceiling rose is ready for connection the lampholder can be connected to it with the flex. Under the cover of the ceiling rose there will be a short tube moulded to the centre of the fitting. It will have two holes, one in each side. Through these the flex is fed and knots tied so it will not pull back.

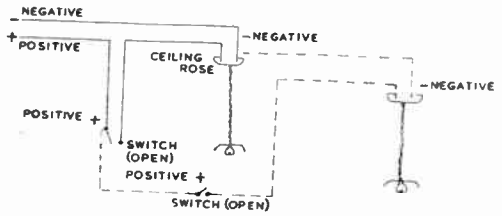
Enough is left beyond the knots to make connections, the ends are bared and then screwed under the flat terminal screws. Thread the ceiling rose cover and lampholder cover on the other end of the cable and then connect the lampholder, making sure the flex is wrapped firmly around the two arms moulded to hold it against strain.

If you are lucky there will be a beam near enough the hole in the ceiling to take the screws for the ceiling rose block. If not, a piece of timber will have to be wedged between two beams. Drill the block to take the wires, slightly different to the switchblock, cut the wire loop, bare the wires and feed them through the block. Then screw the block into place and connect the ceiling rose assembly. Check that screws are tight and connections firm and then screw the rose into place and replace the cover.

Connections

Before attempting any connections—switch off. Then remove the old switch and its block. The chances are there will be two or more wires twisted together in one of the leads. If so, connect the new wire and replace switch. If the live lead is not indicated in this way it must be found, either with pole finding paper or by the simple process of trial and error. In this case make only temporary connections.

Unscrew the old ceiling rose and block and remove them from the wires. Again, it is likely there will be two



The new circuit is shown by broken lines

wires twisted together where another point has been looped in. The new lead is connected to this and the ceiling rose replaced.

If the live lead is not indicated, make a temporary connection and try the new light. If it does not work on its own switch, quite independent of anything else, then one or both the new connections are fitted to the dead side and must be changed over.

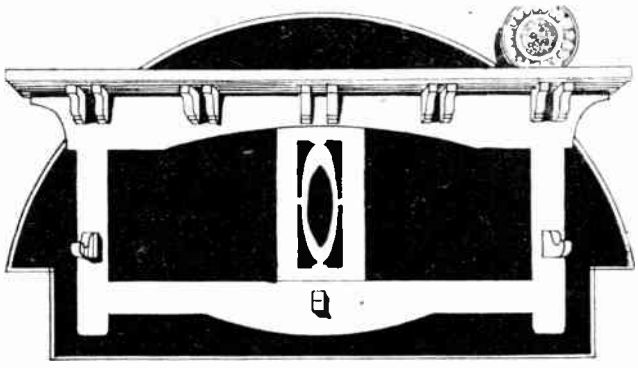
Neat Finishing

All that remains when the connections are finally made is the tidying up. The visible wires will be those from the new switch to the ceiling. These can be held in special slips which can be bought, covered with a wooden beading, or it can be plastered into a groove cut into the wall surface. In this case it is as well to use beading as a temporary measure until redecorating time comes round.

These jobs are well within the ability of the handyman electrician. He should take pride in his work and see that everything is done in a clean and workmanlike manner.

An ideal piece of furniture for the small hall is this

HAT AND COAT RACK



ILLUSTRATED here is a useful hat and coat rack suitable for a small hall or entrance lobby. The rack is of very simple construction in which the fretsaw may be used to execute a great part of the work. The main frame is made of two side rails, a top rail, a lower rail and a central panel.

The front view of the frame, Fig. 1, gives the positions of the rails and how they are to be fixed together. The side rails (A) are 11ins. long by 1½ins. wide by ½in. thick. Top rail (B) is 21ins. long by 2½ins. wide at the ends, and 1½ins. deep in the middle, by ½in. thick. The bottom rail is 21ins. long by 1½ins. wide at the ends and 2½ins. wide in the middle, by ½in. thick. The middle panel is 8ins. long by 4ins. wide by ⅜in. thick.

The top and bottom rails are halved and dovetailed into the side rails, and these joints glued and screwed. The manner of setting out the dovetails is shown in the detail Fig. 2 and the sketch alongside it. The tenons on the rails (B) and (C) can be cut with the fretsaw, while the recesses to take them are cut down with a ½in. chisel.

Shaped Bottom

To get the curve of the underside of rail (B), first set across the centre line and extend this downwards on the bench or table for a couple of feet, as shown. At this point put in a fine brad and then with looped string and a pencil describe the arc. Note here that the curve on the lower edge of the rail (C) will be done in a similar way to the rail above, only the string and loop will be set at 15ins. instead of 24ins.

The work of cutting the curves in both instances will be done with the fretsaw. The middle panel (D) will be recessed at the top and bottom into the two long rails, similar sinkings being made in the two front edges of the panel. Note here that at the top of the panel the line will be curved.

The best and accurate way of getting this curve is to lay the panel beneath the top rail in the position it will assume when fixed, and then mark it in pencil or with a scriber. The cutting down can then be accurately cut in. Test all the dovetailed joints before actually gluing and screwing them together, and see the frame lies flat and level on the bench or table at completion.

There is a nice little bit of fretwork to do in the centre panel, and the enlargement of the outline for this can be taken in hand by following the copy in Fig. 3. As before stated, the panel of ⅜in. wood is 8ins. by 4ins. In the diagram the left-hand side of the fretted part is divided into 1in. squares.

Simply draw similar squares on half the panel of wood and line in the curves. Trace these off and transfer them to the other side of the centre line. Then carry out the cutting in the ordinary way with the fretsaw. Clean off all edges with glasspaper and then glue and screw the panel in place between the rails.

The Top Shelf

The shelf which runs along the top of the frame measures 27ins. long, 4½ins. wide and ½in. thick. It is fixed to the top edge of the back rail with glue and screws. In fixing the shelf see it projects an equal distance at each end.

To form a finish between the ends of the back frame and the bottom of the shelf, small shaped brackets cut to the outline shown in Fig. 4 are glued and nailed in place. Sink the heads of the nails and fill with a filler.

There are ten small brackets of ½in. thick wood to be fixed beneath the shelf, and the outline of one of them is shown in Fig. 5. Mark and cut one bracket and clean it up, making the cut edges smooth. Use this cut-out as the template for marking round to producing the other nine brackets. Space out each pair of brackets as seen in the sketch of the finished frame, and glue them securely, putting in a screw, perhaps, at the back of each as extra fixing.

Wooden Pegs

Three hat pegs are shown in the illustrations but this number could be increased if desired. It should be mentioned here that the rack is not intended for heavy coats. In fact it would be best to hang up only light articles like raincoats or mackintoshes. The pegs may be cut from ½in. wood to the shape shown in Fig. 6. At the back of these pegs a ⅜in. deep tenon is included, this being very necessary to help take the weight which the peg must bear.

For fixing the rack to the wall it will be best to screw on two metal hanging plates to the back frame on the upright rails (A). These will take the weight much better than if the plates were attached to the back edge of the top shelf. The fixing nails or screws for the rack should be plugged into the wall for fixing.

Almost any kind of wood could be employed. The best effect would, of course, result from oak or one of the many good class cabinet woods. Even pine or deal might be used with a finish of stain and varnish.

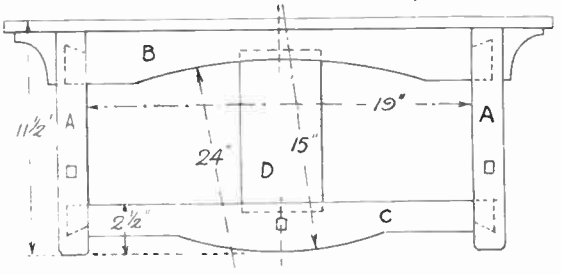


Fig. 1—General outline of main parts with dimensions

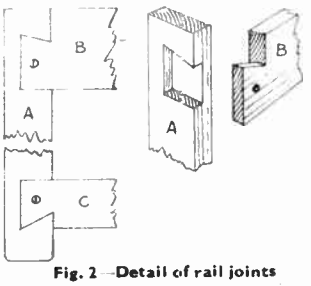


Fig. 2—Detail of rail joints

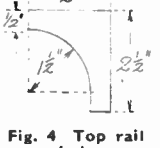


Fig. 4 Top rail end shape

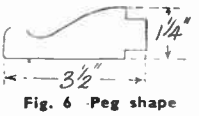


Fig. 6 Peg shape

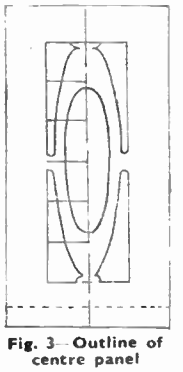


Fig. 3—Outline of centre panel

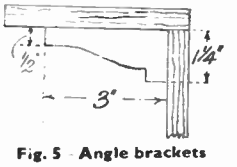


Fig. 5—Angle brackets

Some useful suggestions for those who are spending

EASTERTIDE AWHEEL

CYCLING is a happy way of spending the Easter holiday. Falling in early April, this year we anticipate a spell of favourable weather. Of course, it is too much to expect perfect holiday conditions, for spring weather is apt to be fickle, therefore it is advisable to go prepared for those showers that bring forth May flowers. Take your cape.

Anyway, Eastertide affords us the first long holiday period of the year. The call of the open road is irresistible, and cyclists avail themselves of this golden opportunity to explore the greening countryside, and revel in the joys awaiting.

April brings bright and beautiful things. It is the month that bequeaths to us the golden daffodil, the primrose, the celandine, butterflies again, and bird-song, bluebells and lady's smocks. April often brings balmy days and blue and sapphire skies.

Each passing day increases the country-side's charm; the face of Nature beams with springtide smiles and 'vernal graces'. Joy of living fills the earth. The cyclist appreciates all these delights—the emerald green of the fields, the budding hedgerows bright with tear-drops from her fretted skies, the cow-slips in the grass—all the fleeting charms of the awakened year.

The Strenuous Tour

To some riders the strenuous tour will appeal. They may desire to 'do' some picturesque district, explore as much of a particular county as possible in the time at their disposal. To make a round of ancient castles with historic associations, explore a river valley, or undertake a pilgrimage to some locality famous by its associations with well-known people. There is Shakespeare's country, the Lorna Doone countryside, the Wessex of Thomas Hardy, or that district linked with the Brontes, to mention a few. There is not a county in Britain but has some appeal to the cyclist.

Surrey and Sussex are recommended to riders living in the London area, and Kent has many features of interest. Suffolk—in particular Constable's country—is full of charm with its old-world villages of the Brecklands, and Norfolk is a fascinating region with its Broads and rivers. Derbyshire and its dales, Wild Wales—indeed, the list of attractive tours is almost endless, and we could go on indefinitely.

Outstanding at this season we do not overlook Devon, Cornwall, and Somerset (for spring comes early to the delectable West Country), or the claims of Dorset, a county immortalized by Thomas Hardy.

Other cyclists at Easter may prefer a 'potted tour'. There are many popular regions listed under this heading, covering mileages of from 100 miles or so to 300 miles. Those riders who like 'pottering'—taking things easy, and preferring to loiter here and there in order to taste of the pleasures of exploring charming places instead of passing through with no more than a casual glance. These cyclists may plan nice little tours easily covered during the four days' Easter break.

Pencil, Notebook, Guide and Map

With a pencil, a notebook, a guide to the district chosen, and an O.S. map of same, one can outline a pleasant enough route that can be taken comfortably to suit one's capabilities and physical powers. Older riders especially will benefit by 'pottering'. As we creep on towards middle age we should begin to realise our limitations.

One hundred in a day may have been done without undue risk in our younger days, but we find that 50 to 60 is enough, in the years when grey hairs increase, or maybe, we lose most of our 'thatch'. It is no good taxing one's energy to a dangerous degree.

Eastertide, if fine and springlike, is not too early for the hardy youngsters to sleep out in a tent. This cycle-camping is more strenuous, but, for those energetic and strong, and well on the right side of the meridian of life, a holiday of this description is crammed with fun and adventure. If two youngsters join forces, the work of transport can be halved.

Of course, such a tour entails more planning. You have to find suitable camp sites, get to them, and pitch the tent and prepare meals. Carry as little luggage as possible, cut out everything save necessities.

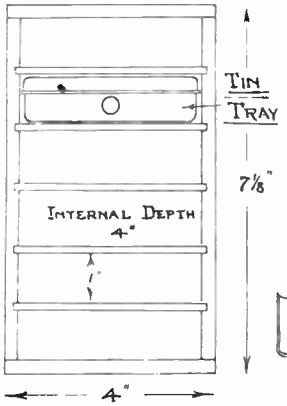
Camping has this advantage, you are independent of lodgings—the 'bed-and-breakfast' accommodation. At Eastertide, when everywhere is crowded with holidaymakers, this is a worth-while consideration.

There are the hostels, of course, but even those appreciated spots are often over-crowded during a popular holiday season. Whatever sort of outing you plan, it is important to remember your nightly 'doss', and arrange accordingly.

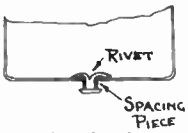
A Useful Nest of Drawers from Empty Metal Boxes

WE all use or can obtain discarded tobacco and other tins for storing screws, tacks, small tools and the other oddments in the workshop. The rack described enables the tins to be kept in an orderly and accessible way, and makes a neat nest of drawers.

It is made of wood and the drawing gives details of a rack to take six oblong 2oz. tobacco tins. It can, of course, be constructed to individual requirements for other size tins.



Front view and detail



Section showing knob

From a piece of ½in. thick wood, cut the top and bottom of the rack, each 4ins. wide and 4½ins. deep. Plywood is quite suitable for this. The two sides are 6⅝ins. high, 4½ins. wide and ¼in. thick, while the back is 7½ins. high by 4ins. wide by ⅛in. thick. Each of the five shelves is 3¾ins. wide by 4½ins. deep by ⅛in. thick.

Form five grooves ⅛in. deep in each side, leaving 1in. between each. The top and bottom are butt-jointed to the sides, glued and nailed together. Glue and nail on the back with ½in. tacks.

When set, glasspaper the surface and paint in aluminium colour. The tins should also be painted with aluminium paint, as this will help to prevent any tendency to rust. Or they can be put in boiling water with soda, when the paint will disappear, leaving a bright surface.

An effective knob for each tin can be made by using a bifurcated rivet, with a copper spacing piece between the head of the rivet and the tin, as seen in the detail. Drill a $\frac{3}{16}$in. hole in the centre of the end of the tin. Cut a spacing piece ⅛in. long off a length of $\frac{3}{16}$in. diameter copper tube, and press this over a ½in. rivet, right up to the head. Push the rivet into the hole in the tin, and knock over the ends. Alternatively, bakelite knobs can be purchased and fitted.

You can make and arrange interesting exhibits by planning

MODELS IN GROUPS

MOST readers of Hobbies Weekly probably have a copy of Hobbies Handbook, and from it gather numerous ideas of articles and models to make. Its pages should certainly produce an ample number of things to do. The suggestions which follow will probably be something which may not have occurred to them, but which have proved successful in a number of instances.

Few realise, for instance, what interesting groups of historic or modern ships or machines can be made from the various models shown. These groups can be particularly interesting to schools or clubs, and we know that already a range of subjects has been worked out co-operatively by the students and members.

Types of Models

Let us then, look at the possibilities of which of the models and designs shown in the Handbook can be put together with this idea in view. You may say right away, that the models are not related to each other in size, and that whilst some are quite small, others would be entirely out of proportion, if put together.

This is quite true, and is necessary in view of the area of the design sheet with which we have to deal. If these models do not relate to each other, there is no reason why you should not make them do so by finding a common proportion for all. In this, you need not be absolutely accurate to scale with each other. It would not matter a great deal whether, for instance, a double-deck bus was ¼in. longer than it should be. It might not look out of proportion to a small car if it were extended to that dimension.

To One Scale

The great thing is to get a general scale for all of them so you can increase the various patterns to bring them in line. By taking any one of the models, you should compare it in size with the others of the range you are going to make. If it is, say, half way between the largest and the smallest, then it will serve as a satisfactory unit to work from.

That is, that the larger sized model can be reduced to the standard size and the smallest size model can be increased up to it. If it is done in proportion rather than in definite inches, the matter becomes easier. If you have, for instance, a bus model shown as 7ins. and you want to make it 14ins., then it is obvious that the parts have to be doubled in area in order to make them in proportion. Or, of course, the reverse is the case in that if you want to reduce, then you can do this by a half, or a third, or two-fifths, or something which will fit into the actual scale of the whole range.

This is the first work which will have to be undertaken after you have obtained all the necessary designs. Having got your all-over scale, then the proportion of the patterns will have to be undertaken too, to bring it down to the sizes required. Fortunately most parts in model making are plain outline drawings, and without all those intricate frets which would be almost impossible to undertake in reduction satisfactorily.

Use a Pantograph

The measuring can be done with compasses, or you may have a pantograph which will make the work much easier. This is an instrument by means of which you go over the outline of the pattern provided and re-produce it either smaller or larger as required automatically. These pantographs are now obtainable from Hobbies Ltd. in steel, or articles have appeared in *Hobbies Weekly* on how to make them.

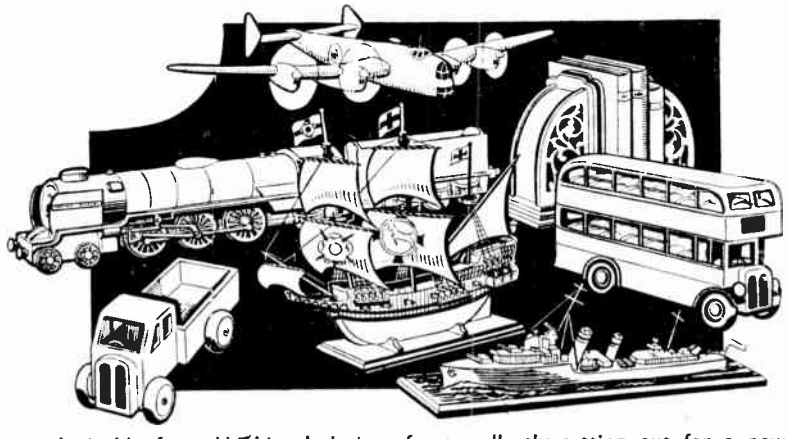
When the designs are cleared up ready for use, you have to consider the question of material. Obviously if you are buying a kit for a small model, there will not be sufficient wood to make an article double the size. Your best plan if possible is to obtain larger panels of wood and then mark out the patterns of the various models in the thickness required.

By carefully fitting the various shapes on to a fairly large board, you can reduce the wastage considerably. The patterns can fit fairly close to each other, jigsaw-puzzle fashion, always bearing in mind to get the grain as far as possible running in the direction which will provide the greatest strength. If you are fortunate enough to have, or be able to obtain, plywood, then use that by all means, because after all, the model will finally be painted so the lamirated edges of the wood will be covered.

Now for some suggestions with regard to the grouping of the models themselves. These suggestions will, undoubtedly, appeal to school groups, because they provide the opportunity of some practical visual results in history or geography or shipping, etc. Much of early history, indeed, is represented by the various old-time ships.

History in Ships

Apart from making models, there is a great deal of interest in the knowledge of how these great ships altered during the course of years. How at one time, very high sterns were built and how guns were innumerable, set on the various decks as well as on the main deck. How these were gradually wiped away in the course of years until you come to the plain severe outline of the more modern galleon type. Or compare the Santa Maria with its single gun, or the Mayflower with its handsome pictorial shield work on the sides and front, gallantly setting out for a new country with but a few guns to protect them against privateers or any marauders of the sea.



In this group you have not only the old-time galleons and ships of the Mayflower type, but you could include the Victory as a more modern battleship than the old-time galleon, and the trading clipper the Cutty Sark.

Modern Boats

In contrast and yet comparison with these old-time ships, you could arrange a group of modern boats for which again, a variety of designs is available. One of our recent patterns is the R.M.S. Britannia, the queer-looking single-funnel ship of sails which was first fitted with paddle wheels and engine to help it get across the Atlantic quicker. With it you could put the model of the Queen Elizabeth and probably reproduce both to scale, which would show very clearly the astounding progress made in size of ships of modern time.

If you want the group up-to-date, showing maritime power, you could include cargo steamers, the pleasure

paddle steamer, a small tug, and even a battleship or other naval ships. There has been, of course, a design for making a model of the Norfolk Broads motor cruiser, but it would hardly do to include this with sea-going craft.

Motor Vehicles

Again, you could take the motor vehicles now published or commonly seen on our roads. Here a further range of designs is available, and you could even build a wayside garage quite easily, with roads coming along to it, carrying the actual models in their approach. What an excellent group it would make to have such models arranged naturally in their places.

The petrol tanker could stand beside the pumps, the motor coach could be coming along in the distance, with its passengers, a double-decker could have just been passed, whilst other everyday motors also in the picture could be the small 30 cwt. van, the large six-wheeled lorry and if you wish to add a wider range, you could include the little racing car, the model jeep and even fire engine. A group of these models would be excellently representative of modern motor traffic.

A careful perusal of the pages of the Handbook, too, would show that many normal village or countryside model groups could be made. There are, of course, the various designs for farmhouses and farmyard figures, and if you would extend your village generally, you could add the windmill taken from its moving platform, the railway stations and footbridges, with, possibly, parts of the travelling circus coming down the road.

Wayside Scene

A toy roundabout would make a suitable addition to a wayside field, and there is the wagon and horses which could be coming along. A model toy of a galloping horse is also available, and if the rider and fence is taken off the platform shown on the design, they could be placed in a suitable position in the countryside scene. In addition there are numerous outlines of dogs, rabbits, cattle, etc., which could well be used. It should be a comparatively simple matter to reduce them to a convenient and common size.

The making of all these models provides an excellent co-operative effort amongst a group or several workers together, because each could be making an individual part and yet know that the whole thing when assembled is going to form an attractive unit. Apart from the fretcutting of the models, there is the enjoyment of painting and setting up for show purposes.

Group Work

Such co-operative effort, too, is often very much in demand for exhibition work, and there are also shopkeepers who are only too pleased to make displays of such novelties on their premises for the attraction and interest of customers.

As suggested at the beginning, the idea may be new to some of our readers, but we are sure that with a little thought along the lines just mentioned, they will find added interest in the designs and Handbook pages to lead to their further enjoyment.

How to ensure neatness and efficiency in

FLEX ENDS AND JOINTS

WHEN doing odd electrical repairs about the home, it is often necessary to retrim the electric wire or conductor ends before fixing to the terminals. Such jobs as refixing switches and heating plugs, call for special attention in preparing the conductor ends.

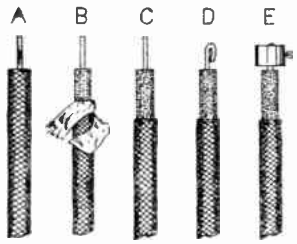


Fig. 1 Stages in preparation

In cases where the wiring is done in all-insulated rubber covered cable, take particular care with the single stranded wire often used in lighting circuits. It is so easy to nick the conductor when trimming off the rubber. It is better to shave the rubber off with a knife, rather than cut in and pull it off as is often done.

Trimming

With stranded wire the same care should be taken in trimming off the insulation, in order not to damage the conductor. Special attention should be given when preparing the tape-and-braid type of conductor often met with, and this is best done in the following manner.

The illustration at Fig. 1 indicates the stages of preparing a single stranded conductor end. In view (A), the insulation is shown trimmed back right up square with the rubber and outer covering of tape and braiding. This idea is not a good one, since the tape and braid tend to set up a certain amount of condensation which must be avoided.

Strip the tape and braid, as indicated in (B), and finally trim it off as (C), leaving about 1in. of rubber with the bare conductor on the end. Before inserting a single strand conductor in the terminal of the switch or other item, double the end over as indicated in view (D).

This method will ensure a much better connection than if the strand is fixed in single. The conductor is finally shown connected to the terminal in view (E), and take care to only have the tip just protruding as clearly shown.

These flexible cords or conductors connected to various electrical apparatus should never be neglected if trouble is to be avoided. If the outer covering becomes frayed and worn, and the rubber insulating the wire conductors becomes bared, then serious trouble such as short circuits with resulting fuse blowing is bound to occur.

Provided the insulating rubber round the conductors has not become damaged, the frayed outer covering of braiding may be covered, and thus prolonging the life of the flex. A good method of making good a worn patch in the flex is described as follows.

Covering

In the detail at Fig. 2 view (E) indicates a piece of flex, the outer braiding of which is frayed, exposing the three strands of rubber to be found in three core flex. If the rubber covering is intact and sound, first bind a length of rubber tape round the worn part, as indicated in view (F).

Commencing about 1in. from the frayed end, bind a layer of electrician's black adhesive tape, as indicated in view (G). Continue the tape well over the other part of the frayed portion, when the finished binding will appear as indicated below. Use binding tape for this purpose not too wide; ½in. will be found most suitable.

Bind it evenly and smoothly in a spiral, and finish off neatly.

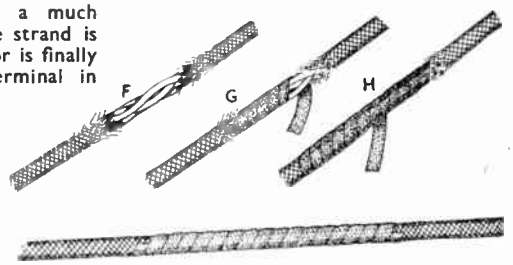


Fig. 2—How to treat and repair worn flex covering

Make a point of also reading all the advertisement pages

For successful photography you should have an occasional CAMERA OVERHAUL

IN a short time from now everyone interested in photography, particularly those who have recently become possessed of a camera, will be making full use of the Easter holidays to get out-of-doors and into the open country by hiking, cycling or motoring. Undoubtedly, the camera will be in evidence, for it is the commencement of another photographic season for most amateurs and the time of the year when there is ample opportunity for some real good pictorial work.

Although most of this article is intended for those who only use the camera on holidays and special occasions, and for beginners, there may be one or two tips which the more experienced might find serviceable before the year is out.

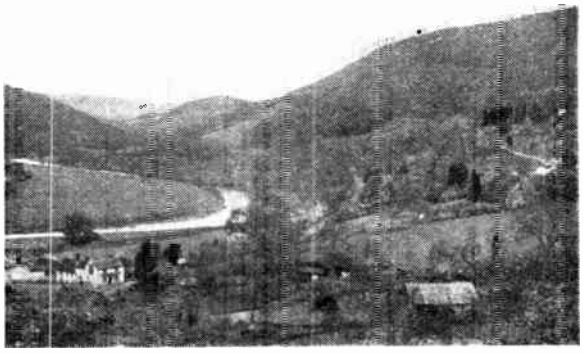
Testing the Camera

The first hint to be mentioned and to which it is hoped every reader will take the very first opportunity to give the fullest consideration, is to spend a few moments on the camera, testing each part to see that it is working efficiently, to be perfectly certain that the inside is completely free from dust and any particles of paper or splinters of wood which may have come away from the spools last season.

It is really surprising what can accumulate in the interiors of both box and folding types. It is also not only surprising but very disappointing when one sees how otherwise good negatives are made useless by some small and trifling bit of something that has found its way into the camera and persists in settling on the film at the time of exposure.

On two occasions during the holiday season last year amateurs asked the writer to explain the markings on some of their prints. In one case it was one fairly large irregular shaped black mark. Of course, it had to be in a prominent part of the print. When the camera was brought and the back opened, out dropped a tiny splinter and, as it proved to be the same shape as the blemish mark on the print, it was obviously the cause of the trouble.

The second batch of prints had tiny spots scattered all over them. The camera was one of the box type and when its back was opened and the sides were given a rap quite a shower of dust appeared on the tabletop. The owner admitted that when he took the last spool out of the camera at the end of the last season he unfortunately left the camera on a bench in the garage. He did not realise his carelessness till about four or five weeks later when he discovered it and noted that the back was still open. In any case it pays to clean the camera every now and then. A dry cloth or clean brush should quickly remove these hidden spoilers of good films.



A delightful picture of the village of Llandogo

The Shutter Action

When testing the parts do not overwork the shutter. Once or twice at its slowest and quickest speeds will indicate whether it is working satisfactorily or not. You cannot test its accuracy, but if you consider it is faulty, then take it to a reliable dealer and ask his advice. Sometimes the iris or other form of stop diaphragm may show signs of sticking. If it can be got at easily, rubbing gently with a dry cloth will put it right. Do not use any oily rag, it may have got slightly damp during the winter months.

The lens should not require much attention and it is inadvisable to remove or unscrew any parts of it. Clean the outer surfaces with a silk handkerchief if they are easily reached. The rails or slides on which a folding camera is extended may need polishing to remove any dust, dirt, rust or dampness. Here it will be alright to use an oily rag but not the oil can. The film holders and changing device should not want much attention unless they have been subjected to rough usage such as trying to force the changing of a film that was badly inserted and refused to wind.

Finally, the bellows must be tested for pin-holes. Open or remove the back, extend the bellows to their limit, place a dark cloth over your head and the back frame of the camera, then stand under an electric light with the camera back open and held close to your eyes. By gently moving the camera in all directions with the light shining full on the bellows you should immediately detect the slightest flaw, hole or worn-through-section of the leather.

Having gone over the camera in this way without finding any trouble it will give you confidence to start the season knowing that you will not be let down by your apparatus. If anything goes wrong, then it is your working which requires overhauling.

The same view as above from a different angle

New Apparatus

There may be some readers who have been fortunate to have a new camera come into their possession, and, while it is agreed that all this business of overhauling is not necessary, yet it is most important that that hint concerning dust, etc., in the interior should be applied to any new piece of apparatus. It is possible for it to have left the factory without being 'dusted'. In any case a new camera should have a few minutes spent on it before it is taken out and exposures made.

Have the book of directions handy and make yourself familiar with each part by carefully reading all about it and understanding how it works and what is its real function. If you have never had a camera before, or if the one you now have is more complicated than the previous one, then you will find that the time spent in this way will prove of very great value to you. It may save you many failures.

To a very large majority of amateur photographers a new year is soon due to start. The camera has been idle, no exposures have been made and in a week or two fresh enthusiasm will be awakened in the hobby. The second important hint is that one or two 'new year resolutions' be made and kept! If it were possible for you to go into the works of a firm specialising in the

developing and printing of amateurs' films—you know the sort of place where developing and printing is done—you would have not only a great surprise—it might be a great shock. If you could examine a batch of films you would realise the enormous percentage of failures and partial failures.

No Casual Clicks

Do not get the idea that these are through any fault of the developing and printing manipulation. That is not the blame. In 99 per cent it is entirely due to the amateur who bought the film, placed it in the camera and made the shots. Yes! he or she just pushed the trigger down and chanced the rest.

The resolution we have all got to make, and stick to, is that we have completely finished with all haphazard 'snapping'. It is just too costly and extremely disappointing to find that another good picture has been lost simply because of taking a chance instead of using thought and consideration for a few seconds before pressing the trigger.

Reasons for Failure

Briefly let us consider some failures:—That person's head is almost cut off. Look at that church steeple leaning so much over to the left that it will fall over soon. That attempt at a seascape with the sea running uphill. That tree in the foreground of the landscape completely out of focus; so is the picture of what looks like a dog. In another spool there are some under- and some over-exposures. It makes those good negatives jolly expensive photography.

Well that is no exaggeration. It is the sort of work that the 'haphazard' amateur is producing every time a new spool finds its way into his camera and it can be remedied by adopting this method. Purchase a diary and record every shot you make with all the data possible. Such as Time of day, Sunny or not, Film in use, Stop and Exposure time, Distance from nearest object and so on.

Points to Note

This may sound all unnecessary, but it will do more to help you to get 12 good negatives for every 12 exposures than anything else. The fact that you wish to record these items will cause you to watch the light, measure the distance, compose the picture, carefully consider the exposure and stop. You will most certainly use the view-finder to ensure getting everything in and correctly so. Surely with such care and thought it would be a surprise if the negative turned out faulty.

Keep a Diary

If you are really keen on making a success of your photography this year and intend to make something worth while entering in a local exhibition or competition, be persuaded to take this question of a diary seriously. It is very helpful to turn to for reference when tackling similar subjects. It may just prevent an under- or over-exposure.

One of the best diaries is the Burroughs Wellcome, which contains stacks of useful information and includes a very reliable Exposure Meter. This is something every photographer should carry in his kit, for it takes many years experience to be able accurately to estimate the correct time required to get a perfect negative of the many subjects and varied conditions which we have to contend with when out on a photographic excursion.

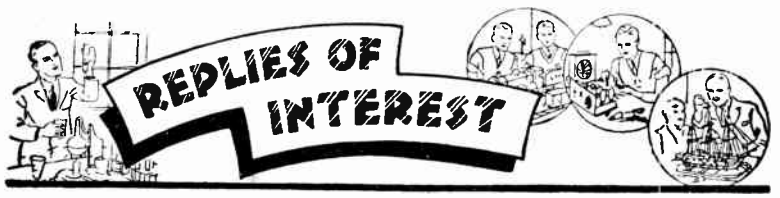
The final hint relates to the storing of 'good' negatives. Some years ago the author worked with a man who started photography as a hobby when he was fairly well on in years but extremely keen on making a success of the work. In order to watch progress he decided to make a print from every exposure. He was faithful for one season only, for when he realised how hopeless some of the work was and how costly, he began to consider other means for improvement and instead of making prints from poor negatives, he only kept the good results.

Negative Storage System

This is the method suggested. Keep every negative in a separate envelope, and give it a title and a number. Include with these details on the outside of the envelope the date it was taken and all the data from the diary, plus any other data as regards the printing and developer used. The actual storing of negatives is very simple if the negatives are not allowed to accumulate. An index for quickly finding a special negative can be made on the following lines—Woodland Scenes 7, 27, 59, 101. Seascapes 37, 54, and so on.

A Prize-winner in Canada

HERE'S proof of the continued and lasting popularity of the fretwork designs published in these pages, as well as an interesting story behind their production. The worker you see in the picture is Mr. T. J. Dunn who lives at 27 Weir Street, S., Hamilton, Ontario, accompanied by his faithful Gem Fretmachine. The picture first appeared in a periodical called "The Harvester", published in Canada, with an interesting story. Tom Dunn is a retired worker who now finds much relaxation and many hours of pleasure with his fretsaw and Hobbies Designs. In a letter accompanying the picture Mr. Dunn tells us he won 1st Prize at the Great Canadian National Exhibition at Toronto and also in a Hobby Fair at his home town of Hamilton. This just shows you the lasting interest fretwork engenders because Mr. Dunn also won a 1st Prize at a Crystal Palace Exhibition (London) many years ago. He is proud of having made nearly every pattern in 1949 and hopes to be able to do the Buckingham Palace Model. This was a large design we published before the war, but which is not now available because sufficient wood cannot be obtained. It is different in Canada. "There is", remarks Mr. Dunn "lots of work to it but we old timers can tackle anything from Hobbies!" At 69 years of age that is a very worthy sentiment which we can pass on to our younger readers.



Improvements for your Wireless Set

Station Separation

WOULD you please tell me the best thing I can do to cut out either the Home service or the Light programme on my crystal set? (A.C.—Cricklewood).

MOST crystal sets suffer from flat tuning because anything which is done to sharpen tuning, also reduces volume. However, a reasonable compromise is usually possible, and you can sharpen tuning by connecting a condenser in series with your aerial lead-in to the set. The smaller the capacity, the sharper will tuning become. A value of about ·0001 mfd., to ·003 mfd. is usual, but a variable or adjustable pre-set condenser is best.

Similar results can be achieved by taking the aerial to a tapping on the tuning coil. The nearer this tapping is to the earthed end of the coil, the sharper will tuning become. Alternately, wind a coil of about 30 turns near the tuning coil winding, and connect one end of this to the earth terminal. Take your aerial to the other end. By moving this winding away from the other winding, tuning may be sharpened.

In bad cases a wave-trap can be used. This is a second tuning coil with a tuning condenser wired in parallel, and the whole is connected in series with the aerial lead-in. The unrequired station can then be tuned out.

• • •

Crystal Reception

RECENTLY I have made a crystal set with a coil and slider. As an experiment, I have tried an old-fashioned rheostat (a coil of wire on a strip of cardboard, fitted round a piece of porcelain or ebonite, with the slider pivoted in the centre) in the circuit, also with a coil between the terminals, but I have heard nothing. Could you tell me if it is possible, if so, what should I do? (J.W.—Sittingbourne).

THE rheostat would not contain sufficient number of turns to reach the wave-lengths of ordinary medium wave stations, and in view of the usual size of these components, it would be difficult to get on sufficient turns. In addition, the shape of the winding is not wholly suitable. It would be preferable to use a former of 1 to 1½in. diameter, varnish same, and wind on about 150 to 200 turns of 32 S.W.G. enamelled wire. A strip pivoted at one end, could pass over the turns for tuning.

If other medium wave stations are received, but not the Light Programme, it appears your particular area is not well covered by this, as regards crystal-set reception. The long wave station may be more suitable. To receive this, you will need 200 to 300 turns on a former of 1½in. diameter or more. Alternatively, a condenser (about ·0005 mfd.) may be connected across the aerial and earth terminals to increase the wavelength tuned.

• • •

Loudspeaker Strength

I HAVE built your 3-valve portable and can only get the Light Programme on earphones, but not on the loudspeaker. Please let me know if there is anything I can do to make the volume better. (A.L.—Falkirk).

IF you have used a 3 ohm speaker without transformer, this is undoubtedly the cause of the trouble, as a matching transformer is essential or volume will be most severely reduced. This transformer should be a speaker output transformer, suitable for use with a battery pentode output valve and 3-ohm speaker. (These details should be mentioned when obtaining to ensure the correct type is provided).

If the receiver howls with tuning condenser plates opened, this can normally be prevented by slightly reducing the H.T. voltage applied to the screen grid and detector, by using a lower battery tapping.

• • •

Power Pack

WOULD you please inform me how to build a Power Pack for A.C. mains only; my set has H.T. + and H.T. — plugs, Grid Bias + and — plugs, and low ension. (R.L.—South Harrow).

TO obtain a current from the mains, you will need to wire a High Tension rectifier in series with one mains lead. Connect a smoothing condenser from positive on rectifier to other mains lead. Also connect a smoothing choke from positive rectifier tag H.T. positive on receiver. Connect a further smoothing condenser across the receiver H.T. leads. Negative H.T. will be taken to the second mains lead. To reduce the voltage to 120 to 150, a resistor of about 50,000 ohms should be wired in series with the smoothing choke.

The voltage drop in a resistor depends upon the current taken which depends upon the type of receiver, so exact values for dropping resistors for grid bias, etc., cannot be given, as these are critical. Because of this G.B. and L.T. batteries may be retained, H.T. only being obtained from the mains.

• • •

"Personal" Wireless Set

AS I am desirous of trying my hand at building a small 'personal' battery radio with a frame aerial, I am wondering whether you could perhaps supply particulars. (H.G.E.—Lancaster).

YOU will be able to make a case of a size depending upon the number of valves (and size of batteries) used. If you use about 75ft. of wire (24 to 28 S.W.G.) for the Medium Wave frame aerial, this will be approximately correct. (The number of turns will, of course, depend upon the perimeter of the cabinet). If Long Waves are required, approximately 210ft. of wire (about 32 to 36 S.W.G.) can be used for the Long Wave winding. The M.W. turns may be spaced by about the diameter of the wire, to increase pick-up. Reaction will be essential, and the reaction winding should have about ¼ the turns on the M.W. winding.

One valve will provide fair earphone reception with about 28 to 30 volts high tension, but only when local stations are received. Two valves are preferable. For fair speaker reproduction, at least three valves will be necessary, and the H.T. voltage should be 60 or more. Grid Bias batteries may be used for H.T. with a torch cell for Low Tension, or the special small batteries may be purchased. It would probably prove best to make use of some of the special small valves intended for these sets, now cheaply available from ex-service stores.

The larger the diameter of the frame aerial, the greater will pick-up be. However, a 2 or 3 valver can be built, complete with batteries etc., in a cabinet about 5ins. by 5ins. by 2ins.

Fairground Wheel—(*Continued from page 371*)

Small figures can be cut out of card, with advantage, as shown. Details need only roughly be inked in to give quite a reasonable impression and these card figures are held by leaving a tab at the back which is split and turned out at right angles—this being glued to the seat.

It might be thought an advantage and added attraction to have the Ferris wheel turned by a handle from a pulley. This can easily be effected by putting a slice cut from a cotton reel on the end of one side of the protruding axle.

From this an elastic band is taken to a *smaller* disc at the bottom of the side upright, this second disc having a small handle attached—a short nail sticking through from the far side will do quite well. The smaller disc is attached by a short screw and keeps well aligned by rubbing against the side of the upright.

The lower pulley is smaller than the one on the axle as the Ferris wheel must be rotated slowly to get a good effect and a smaller disc below puts in a what might be called a 'small gear', the wheel turning much more slowly than the little handle below is rotated. Do not attempt to turn the wheel quickly or disaster may result.

MISCELLANEOUS ADVERTISEMENTS

The advertisements are inserted at the rate of 3d. per word prepaid. Name and address are counted, but initials or groups, such as E.P.S. or £1/11/6 are accepted as one word. Postal Order and Stamps must accompany the order and advertisements will be inserted in the earliest issue. Announcements of fretwork goods or those shown in Hobbies Handbook are not accepted. Orders can be sent either to Hobbies Weekly, Advert. Dept., Dereham, Norfolk, or Temple House, Temple Avenue, London, E.C.4

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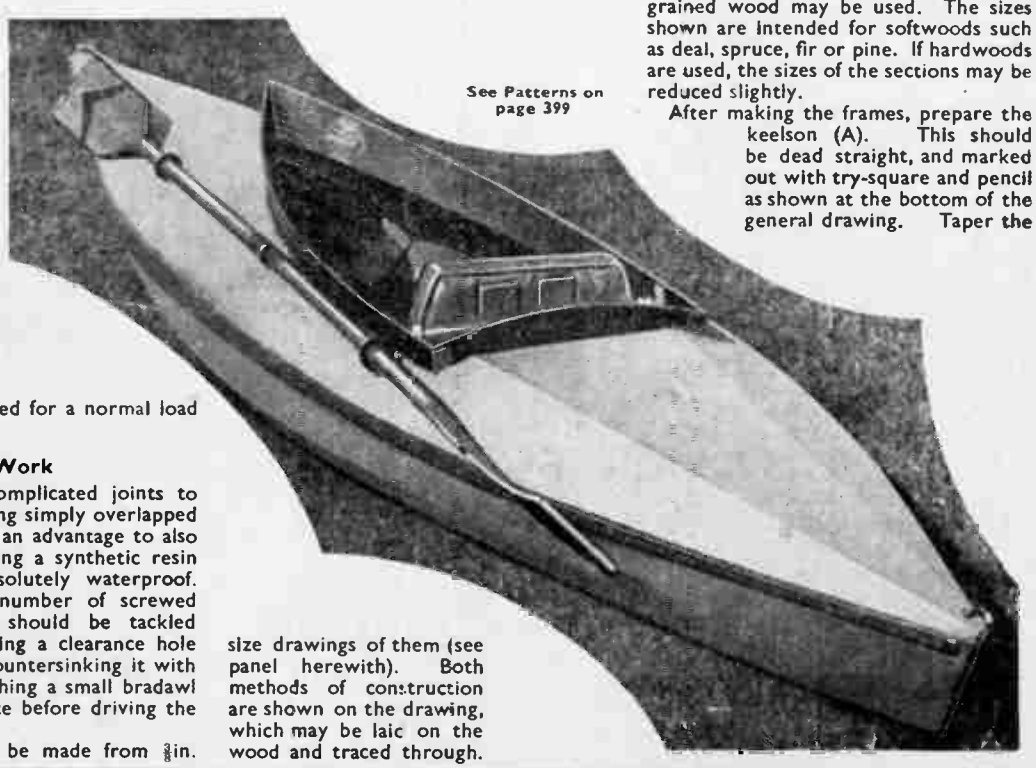
Hobbies WEEKLY

CONTENTS

March 22nd, 1950 Price Fourpence Vol. 109 No. 2838

HOW TO BUILD YOUR OWN CANOE

THOUSANDS of canoes to this design have already been built and used all over the world on rapid rivers, lakes and open sea. The PBK11 design represents the simplest and smallest seaworthy craft. This canoe may be built with simple equipment from easily-obtained materials. With its shallow draught it will float almost anywhere that is wet, yet after its owner has gained some experience he can use it to shoot rapids or make coastal trips. There is plenty of stowage space for touring and camping kit, and the canoe is designed for a normal load of 300lbs.



See Patterns on page 399

Straightforward Work

There are no complicated joints to cut, most parts being simply overlapped and screwed. It is an advantage to also glue the joints, using a synthetic resin glue, which is absolutely waterproof. There is a large number of screwed joints, and these should be tackled systematically, drilling a clearance hole in the top piece, countersinking it with a rose bit, and pushing a small bradawl into the lower piece before driving the screw.

The frames may be made from ⅜in. waterproof plywood, or built up from strips of 4ins. by ⅜in. section softwood (which may be packing case material) overlapped and screwed. As the truth of the finished hull depends on the accuracy of the shapes of the frames, arrangements have been made to supply full-size drawings of them (see panel herewith). Both methods of construction are shown on the drawing, which may be laic on the wood and traced through. Cut to shape with bow saw or stout fretsaw, and glasspaper the edges. Mark positions of stringers and other items shown on the drawings.

The Wood to Use

For the rest of the canoe any straight-grained wood may be used. The sizes shown are intended for softwoods such as deal, spruce, fir or pine. If hardwoods are used, the sizes of the sections may be reduced slightly.

After making the frames, prepare the keelson (A). This should be dead straight, and marked out with try-square and pencil as shown at the bottom of the general drawing. Taper the

ends to 1in. from the last frame positions. Fix the keelson to the frames and end posts (also detailed on frame drawing) with two screws, and glue, at each position. Check that all parts are true with a try square.

A Building Stool

Mount the job on a building slab (any stout plank with a flat surface), cramping it near frame (3) and raising the ends on 2in. blocks (Fig. 1). Stretch a string between the end posts and see that the centre line of each frame coincides with it. Sight along to check symmetry. If necessary, fix temporary struts to any frames needing them.

Fix the gunwales (B) with two screws at each frame. Work from centre to the ends, progressing a little at each side, frequently checking that the distance between frames is the same along each gunwale. At the ends screw the gunwales to the end posts and trim off the outsides flush with the posts.

Fix the deck stringers (D and E) and the coaming frame (G) (Fig. 2), screwing at every point where they cross another member. Fix the top stringer at each side, in the same way as the gunwales, but with one screw at each crossing.

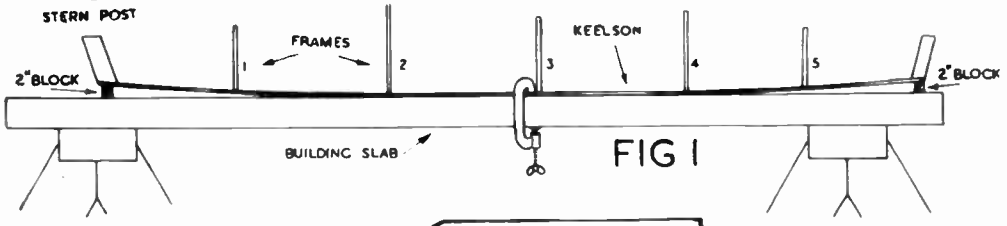


FIG 1

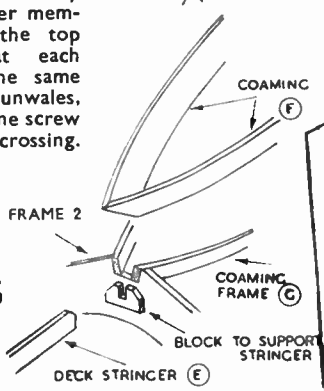


FIG 2

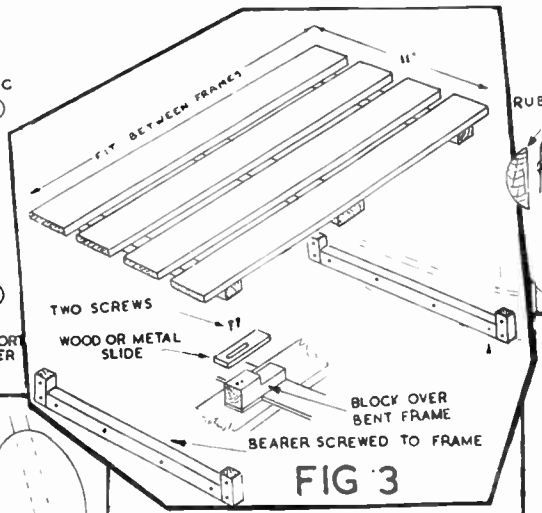


FIG 3

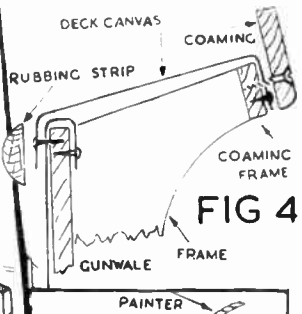


FIG 4

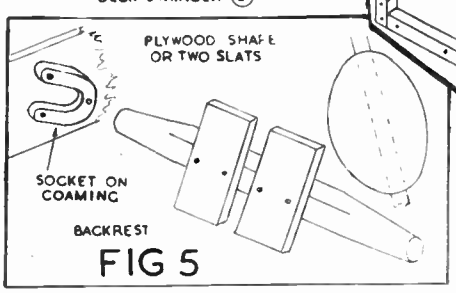


FIG 5

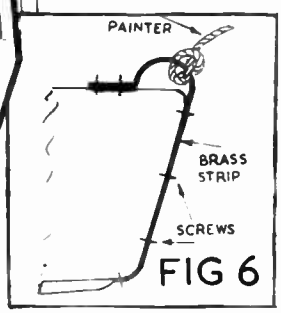


FIG 6

Full-size drawings of frames and end posts are available from The Editor, Hobbies Weekly, Dereham, Norfolk, price 6/- post free. A drawing showing the construction of accessories is also available, price 1/9. The designer will answer technical queries, if a stamped addressed envelope is enclosed. The Copyright of the design is by the author: PBK11. Amateurs may build single craft for their own use.

The structure will then be sufficiently rigid to remove from the building slab and turn over for convenience in fixing the other stringers. Fix the stringers in pairs. A shifting spanner is useful for holding and twisting the ends of the bottom stringers. Cut off the surplus material at the ends and round off with glasspaper.

The two bent frames (J) are made of ⅛in. waterproof plywood sprung into place and screwed first to the keelson, then to each stringer, working outwards to the gunwales. Bottom boards may be made of plywood stiffened by strips, as indicated on the sections on the general drawing, or built up from strips (Fig. 3). Make and fit the bottom boards and their bearers, at this stage.

Clean off all sharp edges, with plane and glasspaper, then give all the woodwork two coats of paint, or varnish if you want it to be really smart.

The canvas for the hull is best bought ready-proofed. Ideally, it should be 42ins. wide, but 36ins. is much more easily obtained and this will just do. Canvas is graded by its weight per square yard, and the most suitable grade is known as '12oz.'. A lighter grade may be used for the deck—balloon fabric is suitable. Alternatively, buy four yards of 72in. width and cut the hull and the deck side by side.

Mark a chalk centre-line on the hull canvas. Turn the framework upside-down and lay the canvas over it with the centre-line over the keelson. Tack the canvas to one end post with ⅜in. copper tacks, then stretch it along the canoe and tack to the other end post. Put further tacks at about 9in. intervals along the keelson.

Turn the canoe right way up and strain the canvas up to the gunwales at amidships. Turn it over and tack inside (Fig. 4). If 36in. canvas is used it will not turn over, but must be tacked on the outside at the widest part of the canoe. Work a little from each side and progress from the centre towards the ends, tacking at about 2in. intervals.

Keep the pull at right-angles to the keelson and work out puckers as they occur. With stout canvas a few small creases are unavoidable and will not matter. Trim the canvas so that about 1in. is turned down inside. At the ends fold the surplus canvas over the ends and tack through. There will then be no cuts below the waterline.

The Keels

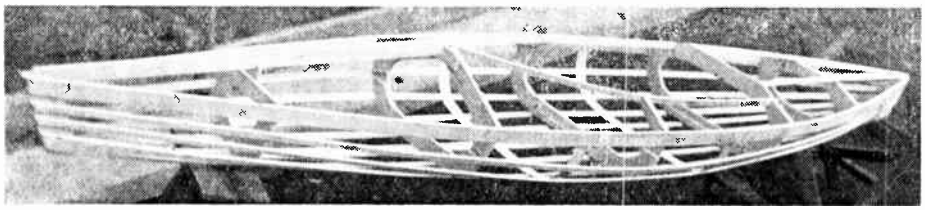
Make the keel (K) and bilge keels (L). Taper them neatly towards the ends. Paint the meeting surfaces and screw from inside while the paint is still wet.

Lay the deck canvas over the canoe and fix by tacking to gunwales and coaming frames (Fig. 4). Do not tack to deck stringers.

If the canvas is ready-proofed, the deck may be left unpainted and the hull given one or two coats of good marine or outside household paint. This will be sufficient for the first season. If unproofed canvas is used it may be treated with one of the proprietary waterproofing solutions before painting. Cover the joint between the deck canvas and gunwale with half-round moulding, screwed at about 6in. intervals.

The cockpit coaming (F) may be made

of softwood, stained and varnished, but it will look more attractive if made of varnished mahogany. Each side of the coaming tapers from 4ins. wide forward to 3ins. wide aft. Cut the forward mitre first, then bend the sides into shape and mark their length, and cut them a shade too long to ensure a snug fit. Fix to the coaming frame with screws at about 6in. intervals. Cut the back of the coaming with a smooth curve to its top.



Backrest

The backrest shown on section 'Y', consisting of two short strips attached to the back of the cockpit, will be found to be in the right place for paddling with a load of camping kit under the foredeck. If the canoe is to be used much without kit on board it will be found to trim better with the seat farther forward, so a separate backrest which fits into sockets on the coaming about 6ins. forward of the back of the cockpit should be made (Fig. 5).

Fix large screw eyes in stem and stern posts for painters, or better still, bend a strip of $\frac{3}{8}$in. by $\frac{1}{8}$in. brass or copper to shape, drilling and screwing to endposts (Fig. 6).

This completes the canoe and you can celebrate the launching. Unless you are a skilled woodworker it is advisable to buy a professionally-made paddle. You need a double-bladed one 7ft. or 8ft. long.

For those who want to add to their canoe there are all sorts of accessories which can be made. A drawing and instructions are available for making paddles, spray covers, paddle brackets, flag sticks, trolley for transporting, as already mentioned.

All these drawings and any answers to constructional difficulties will be dealt with by the author if you send your application, with stamped addressed envelope to The Editor.

MATERIAL SCHEDULE

Part	Name	No. off	Length	Width	Thickness
A	Keelson	1	10ft. 9ins.	2ins.	$\frac{1}{4}$in.
B	Gunwales	2	11ft. 9ins.	2ins.	$\frac{1}{4}$in.
C	Stringers	8	11ft. 9ins.	$\frac{1}{4}$in.	$\frac{1}{4}$in.
D	Deck stringers	2	3ft. 6ins.	$\frac{1}{4}$in.	$\frac{1}{4}$in.
E	Deck stringer	1	4ft. 0ins.	$1\frac{1}{2}$ins.	$\frac{1}{4}$in.
F	Coaming	2	4ft. 6ins.	4ins.	$\frac{1}{4}$in.
G	Coaming frames	2	4ft. 6ins.	$\frac{1}{4}$in.	$\frac{1}{4}$in.
H	End posts, cut from	1	1ft. 9ins.	3ins.	2ins.
I	Bottom boards	2	2ft. 0ins.	12ins.	$\frac{1}{4}$in. ply
—	and	8	2ft. 0ins.	1in.	$\frac{1}{4}$in.
—	or	8	2ft. 0ins.	2ins.	$\frac{1}{4}$in.
J	Bent frames	2	3ft. 3ins.	$1\frac{1}{2}$ins.	$\frac{1}{4}$in. ply
K	Keel	1	10ft. 9ins.	1in.	1in.
L	Bilge keels	2	6ft. 0ins.	$\frac{1}{4}$in.	$\frac{1}{4}$in
M	Rubbing strips	2	11ft. 9ins.	$\frac{1}{4}$in.	$\frac{1}{4}$in. half round

Frames	$\frac{1}{4}$in. plywood	or	4in. by $\frac{1}{4}$in. strips
No. 1	14ins. by 11ins.		3ft. 6ins.
2	23ins. by 14ins.		5ft. 6ins.
3	28ins. by 11ins.		4ft. 0ins.
4	26ins. by 11ins.		5ft. 6ins.
5	18ins. by 9ins.		4ft. 6ins.

Canvas: 1 piece 12ft. by 42ins. (or 36ins.)
1 piece 12ft. by 30ins.

Copper tacks: $\frac{1}{2}$lb., $\frac{1}{4}$in. long
Brass screws: 2 gross, $\frac{1}{4}$in. by 6

Keeping Live Moths

I HAVE made my daughter a specimen box in which to keep her live butterflies, moths and caterpillars and would appreciate advice on general management, e.g., grasses and herbs to grow in the box, insects to avoid, soil composition, etc. (W.W.—*Peterborough*).

IT is difficult to answer your query in detail, for the reason that various species of moths, butterflies and caterpillars have widely different feeding habits. These differences can be read about in most books dealing with insect life, and from them the most appropriate food stuffs can be provided.

In general, a fairly rich, light loamy soil will be best. Plant a few tufts of ordinary meadow grass, wild flowers, and two or three young cabbages; also put in some grated carrot, apple, and any odd bits of available fruits.

It also helps to have a fern or some fairly densely leaved plant to provide shade for night moths.

• • •

Leather Lettering

I DO a great deal of leatherwork, and would like to know how initialing or lettering is done. (J.R.—*Dublin*).

LETTERING on leather is usually done with 'letter' punches, slightly warmed and driven down with a chaser's hammer.

The gilding can be done with gold leaf, in which case the letters have to be very carefully coated with gum, or preferably with gold size, and the gold leaf pressed on to it while still moist.

Gold paint can be used in the manner of printing, by pressing the letter punch on a pad charged with the paint, and applying promptly but carefully to the leather.

• • •

'Tinny' Gramophone

PLEASE advise me on how to stop a winder type gramophone from sounding tinny. (C.R.—*Wallington*).

THE ordinary type of spring driven gramophone is often lacking in the musical quality associated with electrical reproducers, but the quality known as 'tinny' can be caused by many things including a worn record, improperly designed tone arm, loosely fixed metal parts, worn needles, and slackly adjusted pivot points on the needle holder. The Stylus may also be inadequately fixed to the diaphragm, a defect that can be remedied by melting a little hard wax around the stylus and its junction with diaphragm.

Other things which may help to reduce the 'tinny' noise, are to cover the tone arm with felt or cloth, reduce the record speed a trifle, use a thick needle and make sure all metal parts are securely fixed.

Shellac

I WAS very interested in your article on shellac, but it did not state how the gum is made. (A.M.—*Galway*).

NORMALLY, shellac when used as a gum or adhesive is made by crushing the lump shellac into powder and dissolving in methylated spirit or wood alcohol. Sometimes a little resin is added, in which case the shellac solution is warmed, using great care to avoid a flare up, in a double saucepan, the outer pan filled with boiling water.

• • •

Boat Building

IS it possible for an amateur carpenter to build a 9 to 14ft. boat suitable for sea sailing, and also adaptable for an outboard engine? (E.G.—*Bangor*).

IT is possible for an amateur carpenter to make a boat, but if it is intended to go in for sailing, it is imperative that the boat be properly designed and efficiently constructed.

Moreover, it is essential that the user has an adequate knowledge of seamanship as the handling of a small boat in a sea way, is a matter for the expert.

Bearing these matters in mind; if it is still intended to proceed, the best course to pursue is to obtain a design from a qualified naval architect, whose name and address can be had from such books as Yachting Monthly.

For use in the house or garden you have need of a FOLDING CARD TABLE

THIS light weight folding table can be easily made if a small quantity of wood is available. Deal will serve, though a tougher wood like beech or oak would make a stronger article. Red deal, if you can get it, is better than the white variety for an article of this type; either kind must be free of any knots or shakes.

The wood strips for the legs are 1in. wide and ¾in. or ⅞in. thick. Fig. 1 gives dimensions of the leg frames. The legs are joined together in pairs, and fit, one within another to fold up. The table, being of the folding variety, is most convenient for carrying about the house, and storing away when not in use.

The Legs

The four legs are planed to the size and lengths given, and the tops rounded to a semi-circle. Frame (A) should be made the given distance in width by the bottom rail, which is cut from ¼in. plywood and screwed across at 6ins. up from the bottom. In the centre of the semi-circular tops bore a hole to fit a stout brass screw, which will form a pivot, for the frame to fold up. This is shown in inset (A).

Now place the second pair of legs between the frame (A), allowing room between for a washer each side. Mark the centre of each of the legs, and fit the inner legs to the outer ones with a stout brass screw, as in detail (B). Place the washers mentioned between the legs to lessen friction.

Tenoned Rails

This being satisfactory, screw a plywood bottom rail across frame (B) also, and across the top a wood rail, this being 1in. square. This rail can be tenoned across, or just glued and screwed; either will do if the joint is made firmly. The tops of the legs and rail are planed semi-circular, as in frame (A).

Both frames should now fold together, and a point to notice to facilitate this is the position of the lower plywood rails which should be on the outside of the frames. The side view of these frames, seen in Fig. 1, show quite plainly how to fix them for satisfactory folding. The bottom ends of the legs can be slightly rounded off, or left as they are, as preferred.

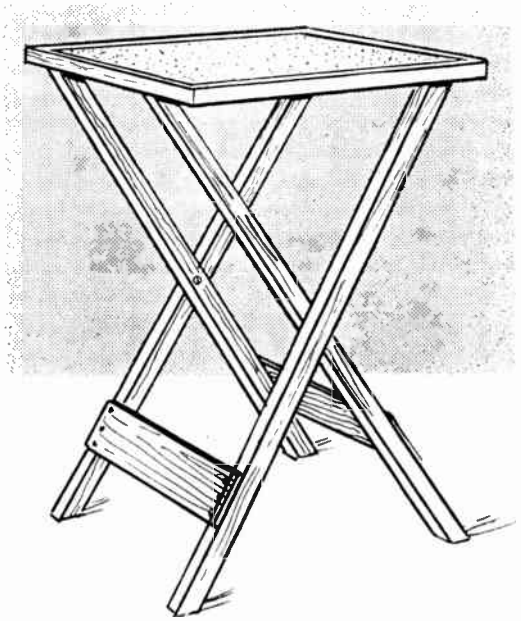


Table-Top Frame

The frame for the table top, seen in Fig. 2, is made to the size given from strips of wood, 1½ins. wide and ½in. thick. Join the frame at its corners with glue and nails, or a halved joint, as preferred. The frame (A) is then fitted with brass screws, as in the diagram, to the extreme right-hand end of the top inside.

Use flat-headed screws and countersink the heads, as these must not project or they will interfere with the folding of the frames. When boring the holes for these pivot screws, and this applies to the middle legs screws as well, bore sufficiently large in one leg for the shank of the screw to fit in, and a smaller hole in the other leg, or in the case of the table top, in the top frame, for the threaded part of the screw to cut its way in. Using this method, both legs and table top should move without the pivot screws becoming loose.

Wood and Baize Top

Now cover the top frame with a sheet of ¼in. plywood, gluing and pinning it down. Trim the edges of the plywood level with the outside of the frame. At this juncture lay the table top on to a sheet of stiff paper and run a pencil round its edge to mark its exact size to the paper. Cut this out, it will prove a useful pattern for the baize cover to be applied afterwards.

Cut 4 strips of wood, ⅜in. thick, and 1½ins. wide, and 1ft. 10ins. long each. These are to be glued and nailed round the table frame, being neatly mitred at the corners. This edging should rise just ¼in. above the top of the table, as in detail Fig. 3. Clean off the work and stain a nice oak or mahogany colour.

Finish the job of woodwork with a coat or two of varnish. It will, perhaps, be more convenient if the staining and varnishing of the legs is done before they are pivoted together.

Take the paper pattern and lay it on a suitably sized piece of green baize. Place

(Continued foot of page 392)

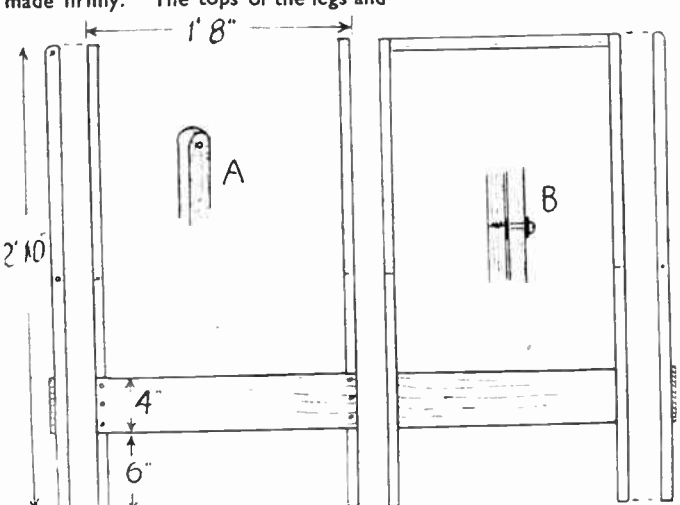


Fig. 1—The framework and side view of each pair of legs

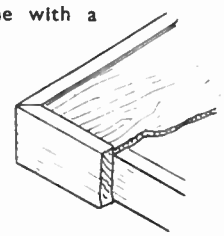


Fig. 3—Detail of table edging

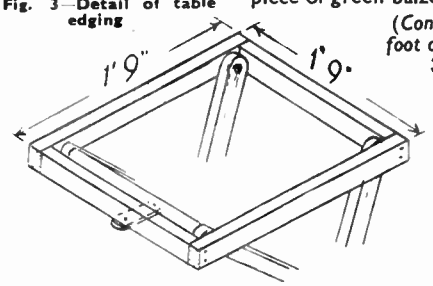


Fig. 2—Detail of top, and leg fixing

Small pieces of odd wood and metal make a practical MATCH AND ASH STAND

THE attractive looking ashtray and match holder shown in Fig. 1 is made from odd small pieces of wood and metal. If possible get two pieces of oak 4ins. square, one piece being, say, $\frac{3}{8}$in. thick for the lower base, and one piece $\frac{1}{4}$in. thick for the upper layer forming the recess for the ash-tray.

Upon the upper layer is fixed a raised metal support for the matchbox, the outer cover portion of which only is used and is slid on to the metal holder shown.

The base is $\frac{3}{8}$in. wood 4ins. square, the octagonal shape being got by carefully setting out, as Fig. 2 shows. First draw in the 4in. square and from each of its corners describe a quarter circle with the compasses set at 2 $\frac{13}{16}$ins. radius. That is, set the compass to meet the exact centre of the square, as indicated in the diagram. Join the points as shown and, pinning the pattern to the wood, prick off these points into it and complete the octagon ready for cutting with the fretsaw.

Twopiece Base

The upper layer of the base, as (B) in Fig. 3, is set out in a similar manner to (A), being the main piece below. The outline of piece (B) is given in Fig. 4 in the solid lines, and this again is set out on $\frac{1}{4}$in. wood and cut out. Glue the two pieces together and clamp up.

Being of wood, some protection must be given against the hot ash, and to this end a neat little metal tray is formed from brass or copper or even tin which could be painted or japanned over. The tray consists of an octagonal piece of metal set out 3ins. square. It has an inner shaped piece for sinking in the depth of the wood overlay, marked out 2$\frac{1}{2}$ins., as seen in the lower diagram in Fig. 4.

The metal can be cut with a pair of tinman's snips or an old pair of scissors. Snip out the V-shaped pieces of the metal so that when each of the eight sides is angled up and soldered the appearance is as (C) in Fig. 4, three only of the upturned sides being shown here, the others lying flat and made ready for

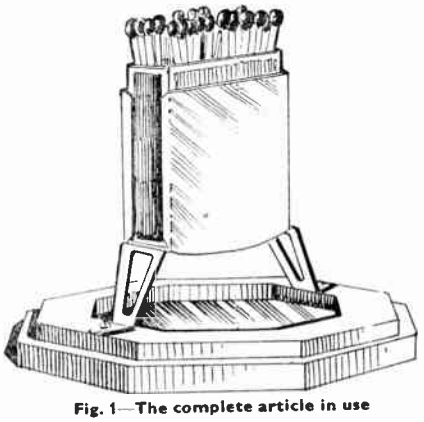


Fig. 1—The complete article in use

angling up. It should be mentioned that the metal tray must fit fairly loosely in the opening so it can be easily removed for emptying and cleaning.

We next come to the making of the box support which stands above the tray. A development plan of this is given in Fig. 5 with all measurements included for the proper setting out and the lines for bending up the metal. Rather stouter metal may be chosen for this support than that used for the tray.

Metal Shapes

Carefully draw out the pattern on to thin paper and then gum this to the metal. See there are no wrinkles left when the gum is dry. Use a metal-cutting fretsaw for the pierced parts and the outline, and use a fine file or emery cloth for trimming up the edges at completion. See there are no sharp corners or edges left which might injure or cut the fingers. Drill the two holes neatly for the two round-head screws which will hold the bracket to the base.

The two curved sides measuring 1$\frac{3}{4}$ins. long by just over $\frac{1}{8}$in. or $\frac{1}{4}$in. wide are to be bent down from the dotted lines shown. Additional stiffening is afforded by these two 'lips' which again add character to the design.

An average size matchbox measures 2ins. long, 1 $\frac{9}{16}$ ins. wide and $\frac{13}{16}$in. thick, but in making the container for it, allowance must be made for a more or less loose fit. The container sides are made 2ins. deep which allows the matchbox to project $\frac{3}{8}$in. above the top, as seen in the sketch of the finished article at Fig. 1.

The Box Container

In Fig. 6 we see the metal required for the container laid out in the flat and ready for the angling up. See the three flat surfaces contained in the whole piece of metal are really quite flat before the actual bending is taken in hand, because this work of flattening cannot be done when once the two sides are bent up.

The two holes to take the rivets which hold the container to the support are drilled exactly to coincide with those in the support. If desired, and should the worker have no experience in riveting, the container could be soldered to its support. Note in the smaller circled sketch of the made-up container how the edges are turned at right angles to the sides to hold the matchbox in place.

Box Holder

Inside the container is a block of wood 1in. high and made to fit up inside the cover portion of the matchbox. The block should be a sliding fit in the lid, and both should nicely wedge up in the container. The matches rest on top of the block of wood and, therefore, project beyond the top of the cover part. This makes for ease in handling them and withdrawing, as can be clearly seen in the picture at Fig. 1.

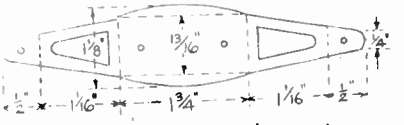


Fig. 5—Marking out metal support

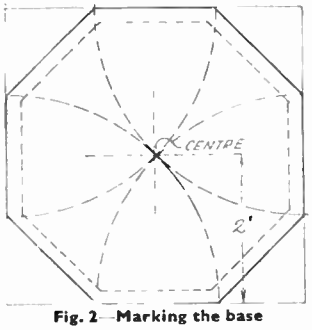


Fig. 2—Marking the base

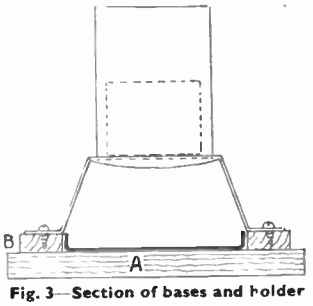


Fig. 3—Section of bases and holder

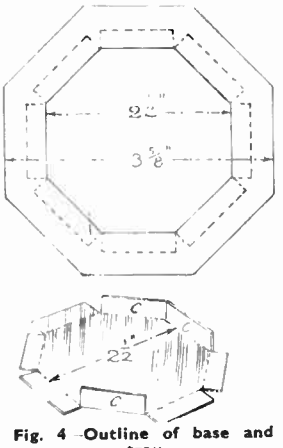


Fig. 4—Outline of base and tray

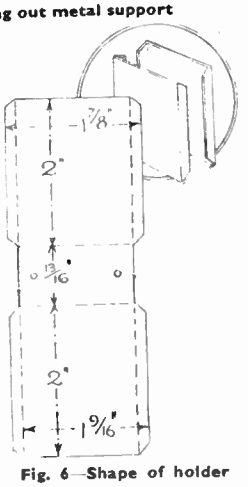


Fig. 6—Shape of holder

How an empty oil drum can be converted to A SMALL GARDEN ROLLER

WATER-FILLED rollers are, of course, no novelty, having been made and used for many years. The salient feature of the design is in the ease of transportation and storage, which is facilitated by the release of the water ballast. A garden roller constructed on this principle has undeniable advantages when compared with the more usual kind of roller, and is not at all difficult to construct.

The cylinder of the roller is adapted from a disused 5 gallon oil drum. The

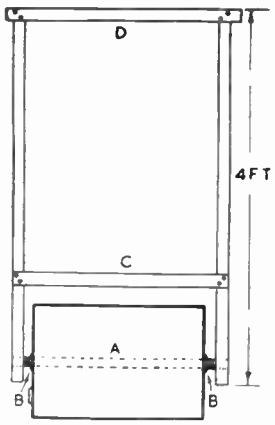


Fig. 1—Side views of parts

drum must, of course, be perfectly water-tight, free from dents and also have a screw-on type of filler cap. Some drums are fitted with integral telescopic draw-off taps but these drums are not suitable.

Having selected a suitable drum, the carrying handle fitted on the top must be removed. The best way is to cut the handle through with a hacksaw, as near the top of the drum as possible, and then flatten the cut ends with a light hammer.

The Axle

The axle is best constructed from iron piping or barrelling. Iron rod may be used, but the piping is to be preferred, as it resists bending stresses to a far greater extent than does the rod. The size of piping required is approximately 1in. external diameter, and 6ins. longer than the overall length of the drum.

A hole 1in. in diameter is drilled exactly central in both ends of the drum and the piping passed through until 3ins. projects from either end (Fig. 1 A). The pipe is then welded or brazed in this position (Fig. 1 B). This job is likely to be outside the province of most handymen, but can be carried out by the local garage or engineer's shop at a reasonable cost.

Framework

The framework of the roller is constructed from a strong hardwood, such as oak or ash. The side members should be 1in. width by 2ins. depth by 4ft. length.

Before assembling, the axle bearings must be installed. These are constructed from thick brass tubing, 1in. in length and of the same internal diameter as the external diameter of the axle shafting. Iron tubing should definitely not be used for this purpose, as when the roller is stored during the winter months, the bearings may become immovably rusted with the axle shafting.

Axle Shaft

One end of each of the bearings is closed by brazing a disc of brass into place (Fig. 2 A) to locate the axle shaft correctly into position. Two suitably-sized holes are drilled near the end of the side members and the bearings inserted (Fig. 2 B). Before inserting, however, a small locating hole is drilled midway in the bearings and when in position in the frame is locked into place by a screw (Fig. 2 C). If the point of the screw projects through into the bearing, it should, of course, be carefully removed with a file.

The framework is assembled by inserting the axle shafting in its bearings and screwing or bolting the cross-strut (Fig. 1 C) and the handle (Fig. 1 D) into position.

The Rail Handle

The cross-strut and handle are constructed from similar sized wood to that employed on the side-members. They should be screwed, or preferably bolted, securely into position. Two screws or bolts should be used on each end to prevent any lateral movement occurring. The edges of the handle should be nicely rounded off and smoothed with glasspaper to provide a comfortable grip.

The roller can be finished with any bright hard-wearing enamel and when dry is ready for use. Preparatory to using, it must, of course, be filled with water. Any quantity up to 5 gallons may be used, according to personal requirements. When filled to capacity, the roller weighs approximately 50lbs. or so,

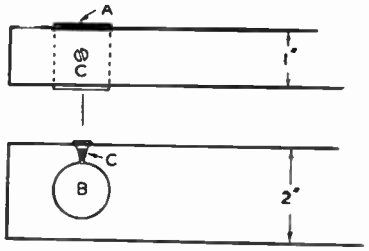


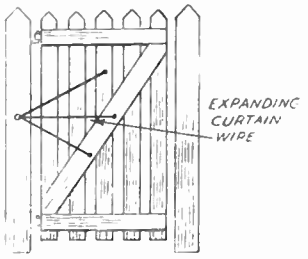
Fig. 2—Plan and elevation showing bearing

and is adequate for the average garden. The screw-filler cap must have a sound washer, otherwise a continual water leakage will occur at this point which will necessitate an occasional refilling with water.

The roller should not be used on very stony paths and runways, as the drum, being of thin metal would very quickly dent. If the roller is required for very rough usage as described, it should be filled with a cement ballast which is allowed to harden before being used. With a cement filling, however, the roller is inclined to be heavy and clumsy and not so easily transportable as the water-filled roller.

A Garden Gate Tip

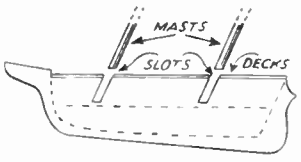
A CHEAP and neat way of keeping a garden gate closed after use, is to get some expanding curtain rod wire.



Cut it into three equal lengths and fix some curtain eyes on each end. Three hooks are put at an equal distance on the middle bar on the gate with one large hook on the gate post itself. Then radiate the three pieces of wire from the gate post hook and fix each wire on one of the hooks which has been fixed on the middle bar of the gate.

Ship's Masts

THE best method of 'raking' the masts of ship models, is to cut slots at the correct angle, in the centre board of the model, as illustrated. The holes in



the deck that take the masts will show the position of these slots, and when the side pieces are added, the result will be seen as an opening passing through the deck into the hull. When the masts are inserted they will assume the correct slope and be held quite tightly.

Several advantages for the radio amateur in making a MAINS CONVERSION

USERS of mains-operated receivers enjoy several advantages. Running costs are very low, compared with batteries; the trouble of renewing the batteries from time to time is eliminated and mains type valves are more efficient. Therefore the conversion of a battery receiver into one intended for mains operation is well worth considering. The conversion is particularly easy with small, home-constructed two or three valvers.

Circuit Differences

With receivers of this kind the tuning coils, tuning condensers, reaction, wave-change and associated circuits will need no alteration. It is only necessary to change the battery valves for suitable mains types and to add a rectifier circuit so that filament and high tension supplies are obtained from the mains. Grid bias is obtained by making use of the voltage drop across a resistor, and so all batteries are discarded.

Mains valves use higher voltages than their battery-operated counterparts and have an indirectly-heated cathode instead of a directly-heated filament, and it is these facts which make some changes essential.

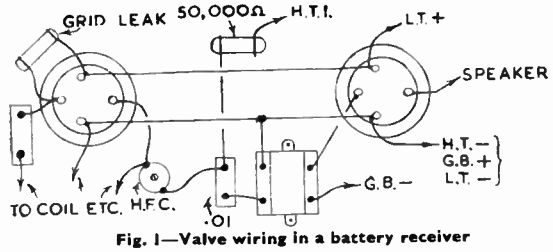


Fig. 1—Valve wiring in a battery receiver

Battery Circuit

The relevant part of a battery-operated receiver is shown in Fig. 1 in which all tuning and associated circuits are omitted because these may take any form and need no alteration. With three valvers, or sets using different forms of coupling between the valves, the modifications required will run on the same lines.

The valveholders should first be replaced by holders suitable for mains valves; these have an additional socket at the centre, for cathode connection. Other pin connections remain the same as with the battery valves.

Wiring Modification

Fig. 2 shows the changes that must be made. The filament sockets are now wired up with twisted flex, all battery leads, etc., being removed. The Earth and H.T. Negative line, which went to one filament, is now taken to the central cathode socket.

To obtain bias for the output valve (connected to the speaker), resistor R2 is added as shown, with C1 in parallel with it. C1 is a bias condenser of about 25 mfd. 50 volts working. Take care it is connected in the polarity shown.

In Fig. 1 the 50,000 ohm resistor was taken to a tapping on the H.T. battery, and probably received about 72 to 100 volts. Now, however, it will receive 250 volts. As this will probably make reaction very fierce, a further resistor of about 50,000 ohms or so, marked R1 in Fig. 2, is added in series. This resistor is not critical, merely reducing the detector anode voltage. If reaction still proves fierce, its value may be increased, if desired.

If resistance capacity coupling is used between the valves in the battery set, this can remain unchanged. The use of mains valves will in any case usually bring about a considerable increase in volume.

Transformer Coupling

If direct transformer coupling is used, with the primary of the transformer connected between the High Frequency Choke and H.T.1., connections should for preference be changed to those shown in Figs. 1 and 2. This is because the new valve type will pass more current than the battery detector previously employed, and if the transformer is not very robust its primary winding may in time fail. By feeding the primary through a condenser of about ·01, as shown, this is avoided as no direct current now passes through the transformer windings.

If the speaker is a moving coil one with transformer, no change will be required here. However, the mains output valve will pass a much larger current than the battery valve; therefore the old-fashioned magnet cone speakers (if used) will not now be suitable. A further point to watch is that the speaker transformer is capable of carrying the anode current required. Most ordinary speaker transformers can do this, but if the transformer is a very small one it should be discarded and a new transformer suitable for mains output valve bought.

The primary of the speaker transformer is connected between output valve anode and H.T. Positive.

For detector, an indirectly heated triode such as the Osram MH41 or any of its equivalents can be used. This requires 4 volts at 1 amp for the heater. For output, a valve such as the ML4 can be used, and with this R2 should be 400 ohms.

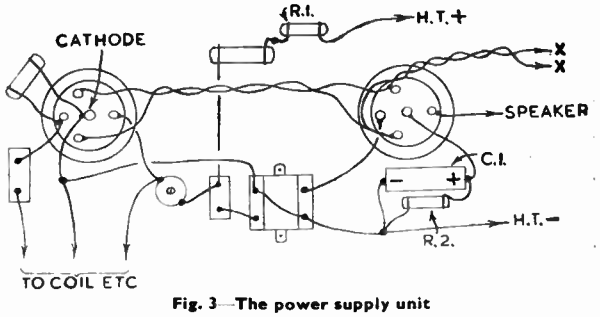


Fig. 3—The power supply unit

Valves and Bias

Actually, many other valve types may be used with perfect success, but each output valve will require a particular value for R2, which develops the appropriate grid bias voltage. The value here will usually lie between 300 and 600 ohms, but results will not be at their best unless the correct value is used, and this will be found on the valve manufacturer's leaflet, or may be looked up in valve reference books.

It is suggested all the valves used be the 4 volt 1 amp. type. However, 6·3 volt valves are particularly easy to obtain cheaply from ex-service stores, and may be used instead, provided the filament supply (obtained from the mains transformer as will be described) is of the appropriate figure. These valves will, however, require valveholders of different shape. Except for this they are similar.

When the change is made to mains-operation, it is quite in order to use a

(Continued foot of page 395)

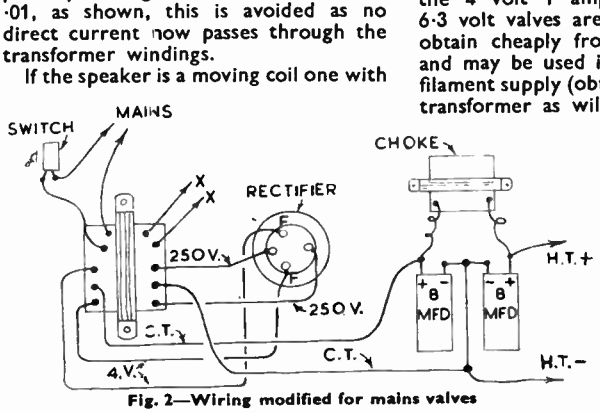


Fig. 2—Wiring modified for mains valves

A Craftsman's Notebook

Cigarette Card Cavalcade

ALWAYS having a certain interest in this direction I was pleased to find, during a visit to Leeds, a 'Cigarette Card Cavalcade' being staged (temporarily) in the city museum.

The exhibits were loaned by members of the Cameric Club, and learning that the membership of this Cigarette Card Society is over 400 one realizes how interest in the hobby continues. Even though it is nearly ten years since such cards had to be discontinued to save paper material. The club was founded in 1935.

Though the majority take the well-known form of picture front and reading matter back, there have been several novel variations. Looking round the cases I discovered some which were new to me. Like the Club Colour Badges printed with the colours of different football clubs and specially shaped to fix in buttonhole or hat. Others reminded me of cards I have myself but never managed to complete into sets—prints on silk, cut-outs, sectional cards to put together into a large complete picture, stereoscopic scenes, etc.

There were also examples of what I call curios. That is, cards having some irregularity or different text. For an example of this rare occurrence I can turn to one of my own albums, number 34 of a series called 'Famous Bridges' bearing the title *Widnes Transporter Bridge* on one card and *Runcorn Transporter Bridge* on another, both being alike in other respects.

* * *

Horseshoe in a Tree

HOME woodworkers who utilize dismantled packing cases and oddments of old wood know the importance of looking it over carefully to see there are no nails left in likely to damage the tools. Sometimes these may be broken or bent over and almost embedded, hardly noticeable at a casual glance.

Amateurs using secondhand material are not the only ones who have to be cautious in this respect. Timber merchants come up against obstacles—and what is more, there may be unseen foreign bodies in newly-felled timber arriving in their yards.

When I was looking at specimens of different kinds of wood I saw some examples of the curious way objects can be lost in growing trees, having been either intentionally or accidentally affixed to the trunk many years ago and in due course become grown over.

Large nails were fairly common, and in another cut log a few links of hefty chain had been revealed. Another unusual object brought to light at the sawmill after lying hidden many years was a horseshoe.

One can imagine the effect such things could have on tools, but fortunately it is possible to detect the presence of these metal objects by means of a magnetic metal indicator, even when they are as much as 9in. deep.

* * *

What Sound Films are Like

IN early Talkies the sound was on a separate disc like a big gramophone record which had to be played in exact step with the film. This sound-on-disc system, however, was soon superseded by the more convenient sound-on-film where the sound, after being recorded separately, is printed on the same film as the pictures. The narrow track runs down the length of the film alongside the pictures.

On projection apparatus the special equipment which reproduces the sound is situated below the lens which projects the picture, so to synchronise the two the sound must be some 14ins. ahead of the picture to which it corresponds. Thus, if we were to snip out a single frame (picture) from a cinematograph film the adjoining portion of sound track would not relate to that particular picture, but to another farther back.

The picture, as everyone knows, is illuminated from behind and projected on to the screen through a lens. As regards the sound, what happens, briefly, is that the track passes in front of a lamp shining through a narrow slit. The resulting fluctuations of light shine on to a photo-electric cell which converts them into fluctuations of electricity, to be amplified and reproduced as the original sound.

The Craftsman.

Folding Table—(*Continued from page 388*)

a sheet of cardboard beneath the baize and pin the pattern to the baize to hold both together. Then, with a straight-edge, laid against each edge of the pattern in turn, trim the baize to the pattern with a sharp knife.

Have ready a pot of hot glue, rather thin, cover the plywood top with the glue and rub the baize well down to it. If carefully cut it should just fit, but if too big, the surplus can be cut away afterwards with a penknife. A neat job results if this is carefully done. Get the baize pressed flat and free from 'bubbles' by running over it with an iron which is not too hot.

The varnishing and staining of the woodwork will not, of course, be continued to the plywood top, but it is as well to let it stray over the edging for about a ¼in. in case the baize is just a trifle too small to cover the space.

A trifling shortage here will not then be so noticeable as it would if the white wood showed up at the joint. The stain and varnish will help to hide any such defect, but it is always wiser to cut the covering material a trifle on the full size, as a surplus can be trimmed off afterwards.

A metal half button can be fitted to the left side of the table top, underneath, shown in dotted outline in Fig. 2, to prevent the top lifting up should it be necessary to shift the position of the table.

HOBBIES IN PICTURES

(Photo: Macclesfield Courier)

IF you have a quarry handy you may be able to get odd pieces of stone with which to take up a hobby such as Percy Cotterell whom you see here at his. All kinds of structures and buildings are made, the tiny 'bricks' being individually shaped and laid to form an artistic and attractive whole. Granite, marble, or any local stone can be used, and all kinds of garden ornaments can be made. Mr. Cotterell is still happy at his hobby at 72 years of age.

THE usefulness of models in architecture has always been stressed in these pages. Here is an example of it in national life. The picture shows you visitors to St. Paul's Cathedral interested in the beautiful model of the replanned High Altar in the Library of the Cathedral. The model is of the whole of the proposed changes at the east end, and is built to a scale of ½in. to 1ft. It shows the complete Sanctuary and the design of the American Memorial Chapel.

THE gentleman with the jeweller's magnifying glass is James Drysdale, Sighthill, Scotland, examining his galleon, clipper and a steamer sealed in a test tube no longer than a matchbox. Mr. Drysdale has only one hand—losing his right arm on the Normandy beaches. Here you see the models in aspirin bottles and dye tubes, made only with penknife and razor blade.

(Photo: Evening Dispatch, Edinburgh)

THE EDITOR IS ALWAYS PLEASED TO RECEIVE PICTURES OF UNUSUAL OR MERITORIOUS MODELS, OR WORK, LIKELY TO BE OF INTEREST TO OTHER READERS.

HOW often a prolonged spell in hospital is the beginning of a pleasant hobby. There is quite a range which patients can undertake, and the result of one by a grateful man is shown here. Charles Erskine, Mid Beveridgewell, Fife, was so thankful for the care and attention he received at West Fife Hospital, he decided to do something practical about it. So he spent his spare time making parts for an attractive tableaux, and then handed it over as a Christmas decoration for his former ward. Quite a nice idea, don't you think?

(Picture by West Fife Photos)

(Photo: Nottingham Journal Ltd.)

A PICTURE of toys which are poured out of a tin! These delightful little figures are made in plaster of paris and then suitably and attractively coloured, by their capable manufacturer, William Hyatt, of Smith Street, Mansfield, Notts. There are miniatures (some only about 1¼ins. high) of dwarfs, bears, etc., and many were used for Christmas Cake attractions. As you see, it's quite a family affair, and has the advantage of being a table-top hobby, although Mr. Hyatt has made larger figures—Snow White's dwarfs, for instance—as garden ornaments.

Painting and Lining Models

by R. C. Rogers

ALL too frequently the models we have to examine or see are more or less spoiled by the poor standard of finish, and we are constantly reiterating in these pages the need for care and attention in the final stages of painting or varnishing. Here is a book every enthusiastic model maker should have if he really desires to improve his results and be able to equal those professional results which all admire. The chapters deal with materials, equipment, letter, lining, varnishing, etc., as well as the technique of the various materials in use, and many helpful drawings provide further details. Whilst much of the matter deals with professional methods, the author, who is an expert modeller himself, shows how many of them can successfully be utilized or adapted by the amateur. The book is of pocket size for convenience and was first published toward the end of last year.

Published by Percival Marshall & Co. Ltd., 23 Great Queen Street, London, W.C.2—Price 3/6

* * *

Carpentry for Beginners

by Charles H. Hayward

WE are always pleased to bring to the attention of readers, a new book by this well-known author. He has such a happy way of explanation—an everyday approach to involved as well as ordinary subjects that the beginner knows quite easily what he is doing, and can really enjoy the occupation. There are clear helpful drawings on all its 200 pages, and—as though for good measure—some more are printed on the inside covers and end papers. The book is particularly useful to the home craftsman because details are given for dozens of everyday things to make—from a tea tray to a poultry run. There are particulars about wood, tools, hinges, and a hundred and one hints on all kinds of jobs. Well printed and bound, such a book can last a life time and never cease to provide information and assistance to any home woodworker.

Published by Evan Brothers Ltd., Montague House, Russell Square, London, W.C.1—Price 7/6

* * *

Mechanics for the Home Student

by Eric N. Simons

THE very title of the book is apt to frighten unduly those whose interests are more in lighter subjects, but there is certainly no cause for trepidation. The author sets out to deal with academic subjects in such a way that they become really interesting! The elementary laws of mechanics as set out here in plain language and enhanced by simple drawings are so easily understood, that there is no feeling of being 'taught' but rather one is realizing what an addition to knowledge can be obtained by such easy means. Its 150 pages are packed with information, and although one is not recommended to go from beginning to end at one mouthful, each chapter is an interesting and complete analysis of the particular subject with which it deals, set out in pleasing and informative way. But although written in such easily-understood language, the facts are correct, because they are vouched for by W. A. Burnet, B.Eng., who is lecturer in Mechanical Engineering, at the University of Sheffield.

Published by Iliffe and Sons, Ltd., Dorset House, Stamford Street, London, S.E.1—Price 7/6

* * *

Garden Railways

by R. E. Tustin

WHEN one speaks of open-air railways, the uninitiated imagine a place as large as a park is necessary, with a proportionately large outlay and operational expense. The author shows how a fascinating model railway in O Gauge can be built and maintained comparatively inexpensively in an ordinary suburban back garden. His own has been in use for more than ten years, and the details and illustrations are largely based on his experiences and experiments. There is something particularly fascinating in constructing a garden railway and the various 'snags' and problems which may arise are dealt with and overcome for the reader so he can begin, with confidence, to erect his own system, without fear of being taken over by the Government! Chapters deal with all aspects of the work from a study of the soil to cover likelihood of subsidence at the beginning to the running of your rolling stock amidst a lay-out of miniature ponds, streams and rockeries. The photographs and diagrams make the whole thing very easy.

Published by Percival Marshall & Co. Ltd., 23 Great Queen Street, London, W.C.2—Price 10/6

* * *

Plastics for the Craftworker

by Graham Fisher

NO doubt every reader has seen the delightful examples of plastic work—cigarette boxes, electric lamp holders, etc.—and wanted to make them for himself. This books tells you all about it, but at the same time the author is wise enough to warn the beginner not to attempt to run before he can walk. Modern plastics can be converted to many useful articles, but the cutting, shaping and polishing must be learned correctly and in proper stages. The way to do it is explained by the author in non-technical language. Commencing with simple serviette rings he elaborates on the processes and ability, warning you of 'snags' and solving difficulties, until you are able to undertake the beautiful pendant room light he illustrates and explains.

Published by Matson's Publications, St. Ives, Huntingdon—Price 5/-

* * *

The Model Boat Book

by G. H. Deason

DURING the course of the summer, and, indeed, almost all the year round, we are constantly replying to readers who want to make for themselves, or their small families a real boat of some kind. Here is a book which would solve the problem of anyone so minded. Indeed, it would do more. Its 128 pages offer suggestions on such a wide range of models that the craftsman would have a fanatical urge to make every one, and be hard pressed to decide on which one to start. Apart from the boats themselves, methods of propulsion are covered in full—sails, rubber motors, electric, clockwork, internal combustion and even steam operated drive. There are details for making a variety of sailing craft, launches of almost all types (and there are quite a number), hydroplanes and even an R.A.F. tender. Instructions are enhanced by excellent photographs and diagrammatic drawings, all being beautifully printed on art paper and bound in strong cover. In many cases, too, it is possible to obtain large blue prints where patterns are shown actual size of the needed parts.

Published by The Drysdale Press, The Aerodrome, Billington Road, Stanbridge, Nr. Leighton Buzzard, Beds.—Price 7/6

Design for a Pair of Book-ends

The making of a handsome Pair of Book-ends is simple with the full size patterns on this week's supplement sheet and the complete kit supplied. This kit of materials (No. 2838) costs only 5/9 from any Hobbies Branch or 6/6 post free from Hobbies Ltd., Dereham, Norfolk.

A handy holdall makes space for cottons, etc., in this SCISSORS CABINET

WHEN a button comes off or some other accident happens to your clothes it is most annoying to have to hunt all over the place for needle, cotton and scissors. Different people borrow these goods and more often than not do not put them back in their proper place—or, perhaps, they have not got a proper place.

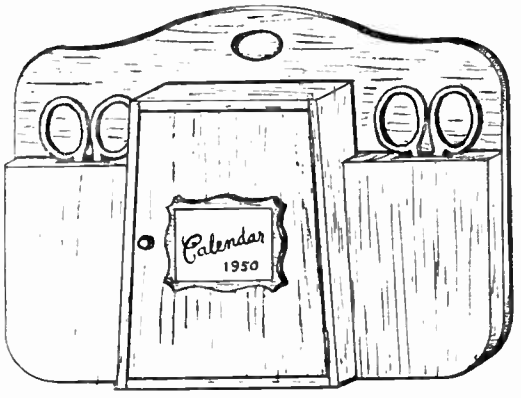
The neat little wall cabinet shown and described here, if hung in a convenient spot, will save a lot of running about and also help to keep the house tidy. It has slots for two pairs of scissors and in the centre a small cupboard to contain all the necessary needlework accessories. It is interesting to note the shape of the door to this cupboard—the sloping sides make it self closing, which is an advantage in view of tidiness.

The design is quite simple and its construction well within the range of the average handyman. The choice of wood must be left entirely to the maker—the ideal being to make it to match the other furniture in the room.

All the parts are securely fixed on to the back, which is 10ins. long, 7½ins. wide and about ⅜in. thick, either in one piece or two glued together, or even plywood. The making of the cupboard will be easier if you cut and fix the holders for the scissors, on either side, first of all.

For these cut two pieces of wood 4½ins. long, 3ins. wide at one end and 2¾ins. at the other, the taper being on one side only. The wood is ¾in. thick, which will allow for a ⅜in. deep tapered slot to be cut out for the scissors. For most scissors a slot 1in. wide at the top, tapering to ¾in. at the bottom, is quite suitable, but it is possible that your scissors are different and may require a little alteration.

Do not forget when cutting these pieces that they are opposites and must not be cut both the same. Before fixing the side pieces on to the back, the slots should be well smoothed with glasspaper. Then they can be glued on and held secure with a few small panel pins from the back.



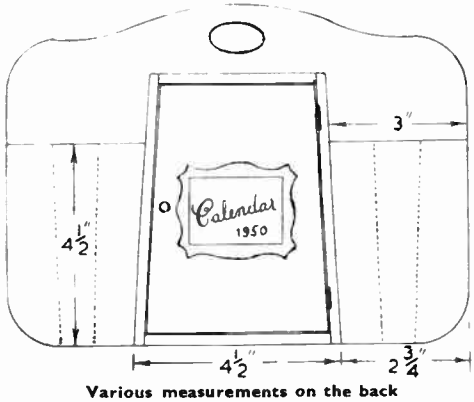
The door does not need to be thicker than about ¼in. and is made to fit easily inside the framework. To keep the door from being pushed right in, a thin slip of wood is fixed to the four sides to form a stop.

To relieve the plainness of the door and also to make the cabinet more useful, a calendar pad is attached to an ornamental overlay of thin wood, as seen. The cabinet is made to hang on the wall, two holes being drilled in the backboard inside the cupboard part for that purpose.

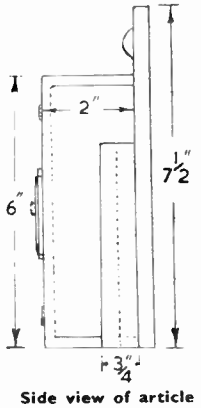
Inside the cupboard a little fitting out is necessary. Two shelves will probably be sufficient to hold most of the various items needed. A small drawer or two would be very nice additions but that is a point you must decide for yourself.

A very useful fitment is a pincushion which can be fixed on to the inside of the door, and could very well occupy nearly all the space. Cut a piece of cardboard to the size you decide to make it, cut a thin piece of wadding to the same size and cover the whole with a piece of velvet, leaving about ½in. all round to turn over and glue down. The card is then glued to the door.

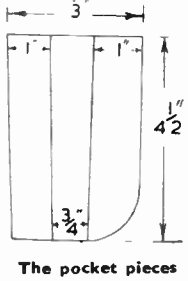
Finishing must be left to individual fancy, as this depends upon the kind of wood used and may call for french polishing, staining, varnishing or enamelling.



Various measurements on the back



Side view of article



The pocket pieces

The framework of the cupboard is made from wood 2ins. wide and ¼in. thick. The two sides are 6ins. long and can be glued in position before cutting the top and bottom. These pieces had better be made too long and then cut to fit—the approximate sizes being 3½ins. for the top and 4ins. for the bottom. If you care to mitre the corners, they will need to be about ¼in. longer.

Mains Conversion—(*Continued from page* 391)

pentode valve in the output stage, if desired, and this will give some extra amplification.

The receiver now requires 250 volts high tension, plus 4 volts 2 amps. for filaments. These supplies are obtained from the circuit shown in Fig. 3. New parts will be required here, but the cost of these will be repaid in twelve months or so, if set against the batteries which would have been necessary.

The whole unit may be built up on a small wooden baseboard. A toggle switch is wired in series with one mains lead, for on/off switching. The mains transformer is of the usual type, and has several windings. One of these (leads marked XX) will be connected to leads XX in Fig. 2, to supply the valve heaters. If 4 volt valves are used, this should be a 4 volt winding; but if 6·3 volt valves are employed, then a transformer with a 6·3 volt winding should be obtained instead.

A further small winding supplies the filament of the rectifier, and for a valve such as the Osram MU12, a 4 volt winding is required. The remaining winding is that which supplies the high tension, and is 250 volts, centre tapped. The centre tap is marked 'C.T.' and becomes H.T. Negative.

The rectifier centre tapped filament winding provides the H.T. Positive point, which is smoothed by the choke and condensers to remove hum. Any small smoothing choke is suitable for a 2- or 3-valver. Note the polarity of the smoothing condensers must be observed when wiring up.

When plugged in and switched on, the whole receiver should work as before but at increased volume. The valves will require about thirty seconds to reach operating temperature.

The revolving fan is a fascinating part of

A THERMAL LAMP

A NOVEL lamp for the study, nursery or for display purposes, is the thermal with its revolving shade. Its mode of operation is quite simple. The ascending hot air arising from the incandescent bulb actuates a rotor which is attached to the lamp-shade, and so slowly and steadily revolves the assembly for as long as the bulb is in use.

The lamp is not difficult to make and by painting or affixing various figures on the shade, it will provide endless amusement for the family. Before proceeding to the constructional details, it should be stated that owing to the many diverse sizes of lamp-holders and shades, no actual dimensions will be quoted, as the reader can quite easily formulate these to suit his own individual requirements.

Metal Rotor

As can be seen from the illustration at Fig. 1, a small rotor is fitted to the top of the lamp-shade. The rotor is made from thin brass or tinplate to the pattern as shown in Fig. 2 A. A small hole is drilled at the bottom of each cut to facilitate the bending of the vanes. These should be carefully bent to approximately 30 degrees angle.

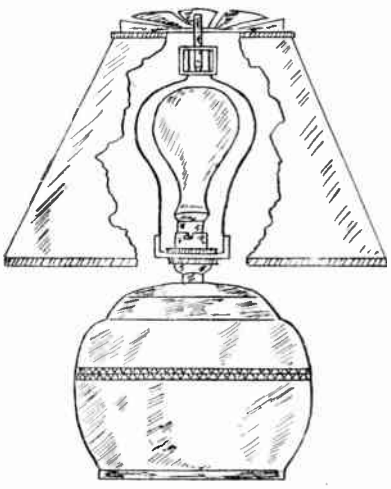


Fig. 1—Cut away view to show 'works'

A small hole is drilled in the centre of the rotor to take the spindle (see Fig. 2 B). This is constructed from a french nail with its point carefully smoothed and trued up with a fine file, afterwards finishing with emery paper. The head of the nail is next removed and the spindle passed through the hole in the rotor and soldered into place.

The complete assembly can now be given a coat of enamel if desired, and placed on one side to harden thoroughly. A good cellulose enamel is preferable, as the oil-base variety is apt to soften with the heat of the lamp and make rather an unpleasant smell. The bearing surfaces of the spindle should not, of course, be painted.

The Bearing

The bearing assembly (Fig. 2 C) is constructed from brass of $\frac{1}{8}$in. thickness to the shape shown in the illustration. A central hole, slightly larger in diameter than the spindle is drilled in the top of the assembly (Fig. 2 D) and a slight depression made in the lower part concentric with the upper hole (Fig. 2 E). The rotor unit should now be inserted and tried in the bearing.

The point of the spindle should fit accurately into the depression and the whole unit should spin rapidly when gently blown upon. If the impellor is not absolutely free, the upper bearing hole should be lightly enlarged until the results are satisfactory. Do not, however, enlarge the hole too much, as this will permit excessive side-play and cause poor and erratic running.

Note the fan at the top of the lamp shade

Tongued Ring

Four small holes are next drilled in the bearing assembly to take the lamp-brackets (Fig. 2 F). The bracket (Fig. 2 G) is made by cutting a ring from either heavy tin-plate or brass. Two projections or tongues diametrically opposed, are incorporated in the ring, and are carefully bent at right-angles. The tongues are then bent or shaped around two lengths of stiff wire and the whole sweated together with solder.

The assembly is then placed into position on the lamp-standard and the locking collar tightened down. The wires are brought up into position to the bearing location, passed through their respective holes and well soldered in. In this way, a particularly sturdy and robust ensemble is assured.

Remember, however, to allow sufficient clearance for the bulb when shaping the bracket-wires. Also, the spindle bearing should be located as near the bulb as possible, to take full advantage of the rising hot air.

The rotor vanes are next lightly soldered to the upper framework of the shade, then the whole carefully placed into position on the lamp. A spot of very light oil is applied to both the bearing points, and the lamp is ready for use.

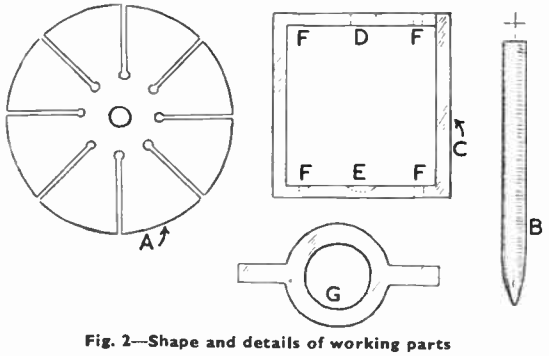


Fig. 2—Shape and details of working parts

Lamp for Heat

A 75watt bulb should give sufficient radiation to work the lamp perfectly satisfactory. Should the movement be sluggish, either increase the wattage of the bulb, or slightly increase the pitch of the vanes by gently bending. The maximum thrust is obtained at approximately 45 degrees angle, and the pitch should not, of course, exceed this optimum. The lamp will not commence revolving immediately it is switched on, as the heat radiation takes a few seconds to attain its maximum value.

Light and Smooth

As the motive power is so minute, it should be emphasised that all components such as the shade, etc., must be as light as possible, and that bearing friction must be almost non-existent.

The moving parts must, of course, be perfectly balanced so the shade revolves evenly and smoothly. The great thing to watch is that the pivot point is quite smooth, and that the depression in which it fits does not bind in any way. All these matters will have to be attended to carefully.

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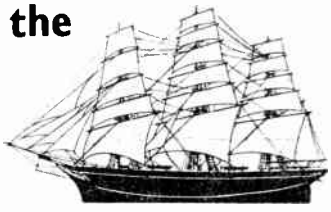

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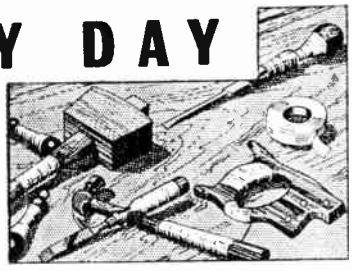

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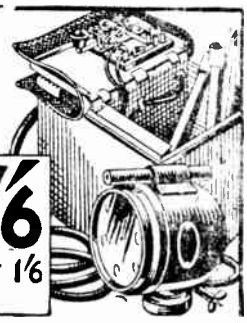

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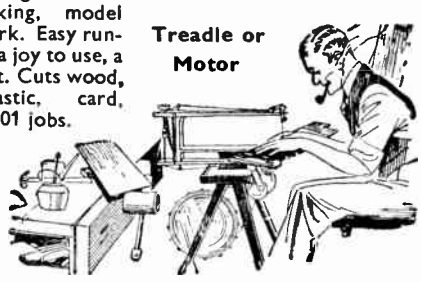

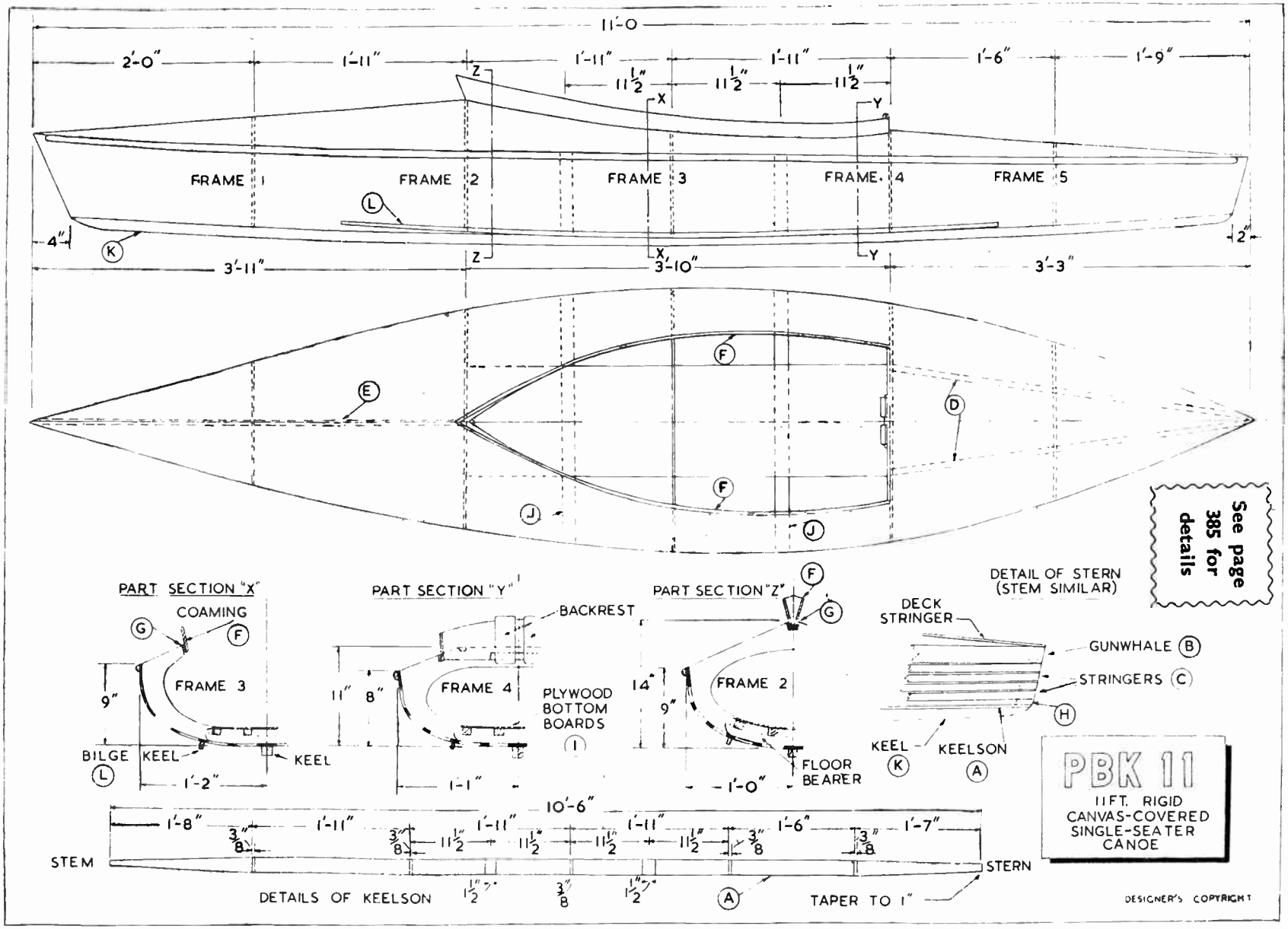

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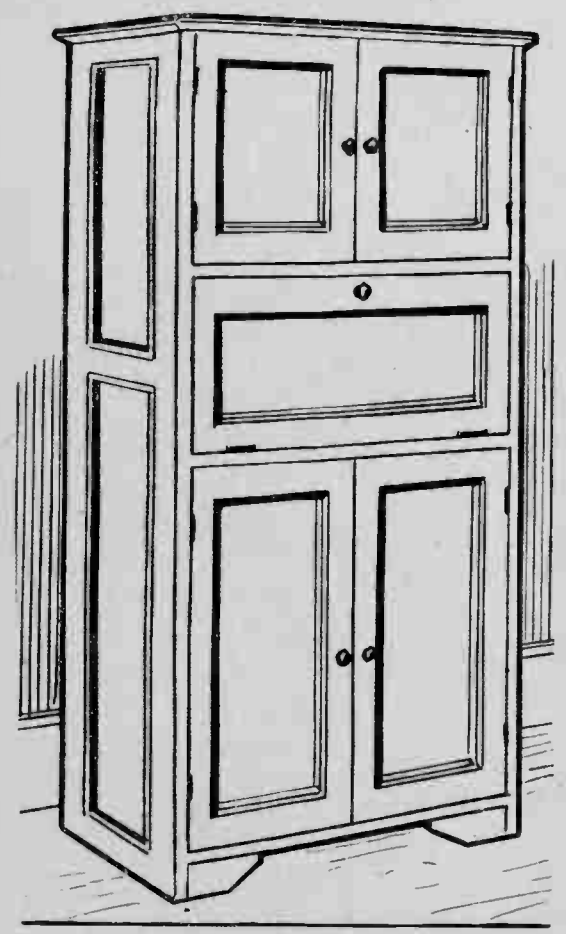
Hobbies WEEKLY

CONTENTS

March 29th, 1950 Price Fourpence Vol. 109 No. 2839

A KITCHEN CABINET

THE improved design of kitchen cabinet, now so popular, can well be made by the handy woodworker himself, if the necessary timber is available. There are no difficult joints to be dealt with in the example illustrated and the quantity of wood required has been cut to the minimum.



Another point worth mentioning, is the absence of the usual drawer, which lowers the height of the cabinet, making access to the upper cupboard easier, especially to the shorter woman.

In place of this drawer a pull-out tray has been substituted, placed in the lower cupboard and intended for cutlery or table linen. Where these articles are commonly kept in a dining room sideboard, the tray can be omitted.

The Framework

Fig. 1 shows a front elevation and a side section, from which dimensions can be taken. Construct the two side pieces first. These sides are framed up from ⅞in. by 2in. wood for the uprights, and ⅞in. by 3in. wood for the rails, except the centre one which can be 2ins. wide. A shouldered mortise and tenon joint is used at top and bottom of these frames, as at (A) in Fig. 3, and an ordinary tenon for the centre rails, as shown.

Glue the frames together, and take some pains to get these square and out of winding. Readers who prefer dowelling can use that form of joint, if preferred. Plywood or a good quality substitute can be used for the panels. These can be fitted in grooves, where a ploughing plane is available, otherwise they are beaded in, as in detail (B).

The Sides

The frames, we can describe them more accurately as the sides now, are fitted together as follows. At the top, as at (C), in Fig. 3, a ⅞in. by 2in. rail is lap dovetailed across at front and back.

The back rail is not quite level with the back edge of the sides but ¼in. in, to leave room for the plywood back of the cabinet to fit in. In the inner corner right-angled wood blocks are glued and screwed, to square up the carcase.

Fig. 4 shows how the bottom and intermediate shelves are fitted across. The bottom is made up of two or more boards of ⅝in. or ⅞in. wood, glued together to make up the depth. It is then screwed to a 1in. square fillet each side, the fillets themselves being screwed to the sides of the cabinet. Let these fillets be 1¼ins. short of the front edge to leave room for the blocks glued left and right at the front of the cabinet, at the bottom. These are shown in Fig. 1.

The intermediate shelves, which form the top of the lower cupboard and the floor of the upper one respectively, are fitted in ¼in. grooves cut in the sides, or slightly deeper grooves if the inner beads are thicker than ¼in., so that the

end edges of the shelves butt against the panels.

Underneath each a ½in. by 1in. slip of wood is glued across, both to the panel and shelves. These slips, of course, extending only to the width of the panels, not the framing. They are obviously necessary to support the centre of the shelves.

Shelving

The shelves are made up of similar wood to that employed for the bottom of the cabinet, and it will be necessary, on account of their width, to glue two or more boards together, edge to edge. Make a good glued joint here. It may be added that the shelves, bottom and fillets, are all cut ½in. less than the full depth of the cabinet to leave room, as mentioned before, for the back.

Now cover the top of the cabinet with the plywood, nailing and gluing it down evenly all over, and cover the cut edges and sides and front, either with a small moulding to form a modest cornice, or just a strip of wood, planed to a bevelled edge, as in the detail, Fig. 3 (D).

The back of the cabinet, plywood again can be cut and neatly fitted in. In the inside vertical angles between the back and sides a triangular fillet may be glued along to keep out dust when the back fits there tightly. Cut two blocks of ⅞in. wood, 6ins. long, to fit in the angles each side of the front, just under the bottom of the cabinet. This practically finishes the carcase.

The doors of the cabinet are framed up like the sides of ⅞in. by 2in. for the uprights and ⅞in. by 3in. for the rails. They are panelled like the rest. The full front, covering the middle space between the cupboards, is framed up similarly, but instead of plywood for the panel a slightly thicker stuff is employed, say, ⅜in. to ½in.

Plywood can also be used here if of the thickness recommended. A beading is nailed and glued in to support this, which should be of thicker wood than that used already, and should be of such width that the panel comes level with the inside surface of the frame.

Swinging the Doors

Hinge the doors with 2in. brass butt hinges, and 3in. hinges for the fall front. A pair of metal stays must also be fitted for the latter to drop at right angles and remain firmly in that position. Cupboard catches and bolts should be fitted to the doors of the cupboards, with thin slips of wood glued inside to act as stops, preventing the doors closing too far in and putting strain on the hinges.

This fall front is not intended to act also as a pastry board, as it seems most people much prefer to use the separate board, usually employed, on the kitchen table. It is more convenient and better lighted. Shelves can now be added to both cupboards, being laid upon wood fillets, screwed to the sides of the cabinet.

Pull-out Tray

The pull-out tray, mentioned already, can be made up as at (E) in Fig. 5. The sides are rebated into the front of the tray and the back nailed between. A bottom of plywood is glued and nailed on. It should be about 2ins. short of the inside depth of the cabinet, 4ins. deep, and any required width.

At each side a ⅜in. square fillet of wood is glued and screwed across, level with the top edge, to form runners. Two pieces of wood are fitted together, the bottom ones being wider than the top, to allow space and support to the tray runners. These are screwed underneath the shelf, or top of the lower cupboard, at the right distance apart, to allow the tray to enter between and slide in and out freely, as at (F).

To the tray fit a convenient pull. The cabinet can be stained oak or walnut, and given two or three coats of clear copal varnish to finish, and should, if neatly made, make a useful and well looking piece of kitchen furniture. A cutting list of the wood required is added to assist readers when purchasing the materials.

In connection with this purchase of wood, it is essential you select the timber with care. Remember it should be seasoned, and of reasonable strength so you can "work" it satisfactorily and be sure it will not warp, or pull after the article has been completed. The Cabinet is likely to have a lifetime of wear and use; it will be most disappointing if it falls to pieces or pulls apart after a comparatively short life. Well made it is a lasting and useful piece of furniture.

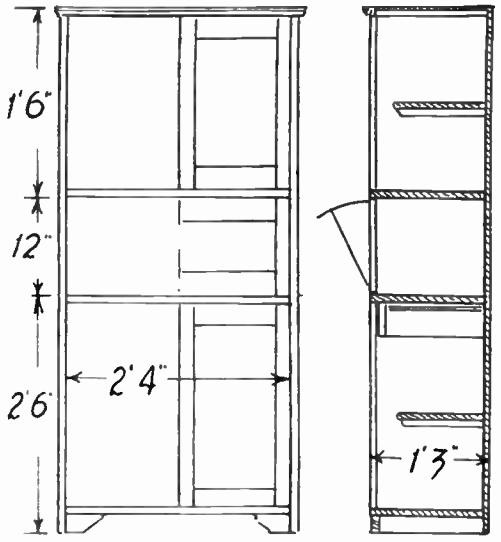


Fig. 1—Front and side elevation

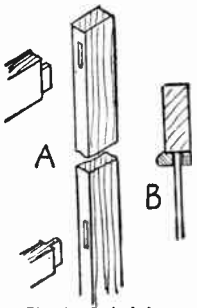


Fig. 2—Rail joints

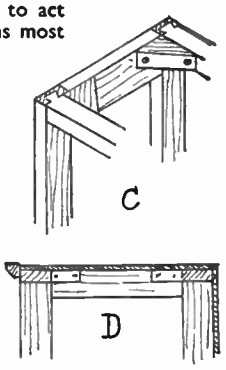


Fig. 3—The top of the cabinet

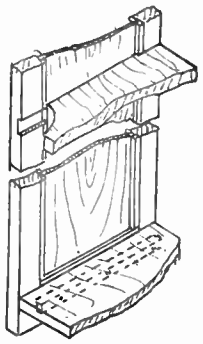


Fig. 4—Shelf fitting

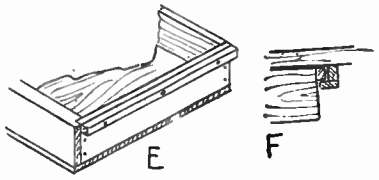


Fig. 5—The sliding tray portion

MATERIAL FOR FRAMING

Sides (4)	5ft. 0ins. by 2ins. by ⅞in.
Sides (4)	1ft. 3ins. by 3ins. by ⅞in.
Sides (2)	1ft. 3ins. by 2ins. by ⅞in.
Top cupboard (4)	1ft. 6ins. by 2ins. by ½in.
Top cupboard (4)	1ft. 2ins. by 3ins. by ⅞in.
Fall front (2)	1ft. 0ins. by 2ins. by ½in.
Fall front (2)	2ft. 4ins. by 3ins. by ⅞in.
Bottom cupboard (4)	2ft. 4ins. by 2ins. by ½in.
Bottom cupboard (4)	1ft. 2ins. by 3ins. by ⅞in.
Top rails (2)	2ft. 6ins. by 2ins. by ⅞in.

Plywood panels (½in.) 1ft 8ins. by 11ins. (2), 2ft. 8ins. by 11ins. (2), 1ft. 2ins. by 10ins. (2), 1ft. 10ins. by 10ins.(2). 5ft. 4ins. by 2ft. 4ins. (1).

All of ½in. stuff. Panel 2ft. by 6ins. (1) of ⅜in. or ½in. 8ins. by ⅜in. or ½in. wood for bottom and shelves, 14ft. run.

Extra wood for tray and small shelves as required.

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A STEP-LADDER CHAIR

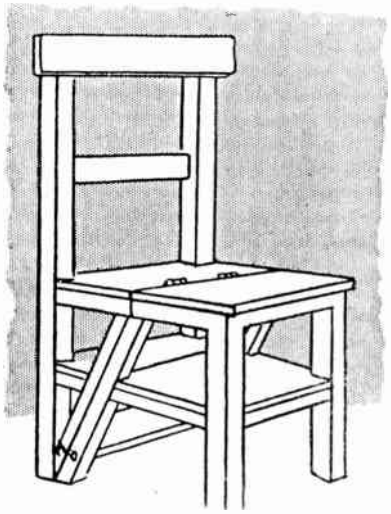


Fig. 1—A perfectly useful chair

A GOOD solid chair, capable of standing up to all kinds of rough wear is always an asset to the kitchen, and it is well-worth building for its ever-willing service. But with a few slight modifications when planning the original design, the chair may be made even more adaptable. There will no longer be any need to stand precariously on tip-toe to reach the top shelf of the cupboard.

In a matter of seconds the chair can be changed into a step-ladder which is strong enough to bear any member of the family with safety. There are no spare parts to be added or any elaborate adaptations. The change can be effected in an instant by an operation which is as simple as the opening of a cupboard door.

Start as a Chair

In building the dual purpose unit it is advisable to concentrate on the construction of the chair only, as it appears in Fig. 1. The more elaborate-looking structure of the step-ladder in Fig. 2 will emerge automatically when the chair is completed.

In principle it is nothing more than a simple, square-built chair, which is divided in two across the middle of the seat, with diagonal supports put in at the division, and two extra 'shelves' underneath which form the treads of the step-ladder. For this reason, as well as to simplify construction details, the actual measurements of each individual member are not shown.

All these can more easily be ascertained from actual measurements of any ordinary chair. The only departure from standard chair measurements is that the seat of the convertible chair is 16ins. in width, both back and front, and it is squared-up instead of increasing in width at the front, as do most chairs.

The back legs (T), which are carried right through and fitted with back rests, are 36ins. long and 1¼ins. square in section. The front legs (R) are of the same size squares and are 18ins. in height. All other members and cross-pieces, except the back rests (A) and (B), are cut 1¼ins. wide and 1in. thick. (A) and (B) are cut from the same boards as the seat and lower 'shelves'.

The Steps

These may be ½in. to ⅝in. thick, whichever is most easily obtainable. The sides of boxes or packing cases are particularly suitable for this purpose, and they should be cut to the details shown on Fig. 3. The corner squares, however, are best left until the finished measurements of the legs and other framing has been determined.

Begin assembling by joining pieces (C) and (H) by means of the two hinges (W) to form the seat. Cut away the corners of (C) to accommodate the square section of the back legs, and fix the seat temporarily into position by nailing through the legs into the edge of the board. Do not drive the nails right home, as they have to be removed later.

Fix the front legs in position with nails driven through the corners of the front half (H) into the top ends of the legs. Remember to allow an overlap of ⅛in. to the front edge of the seat. Fig. 1.

Skeleton Assembly

The assembly then represents the skeleton form of the chair, and by referring to Fig. 1, the size of the different supports and cross-pieces can be measured exactly, from the skeleton structure.

A straight edge from the hinged join

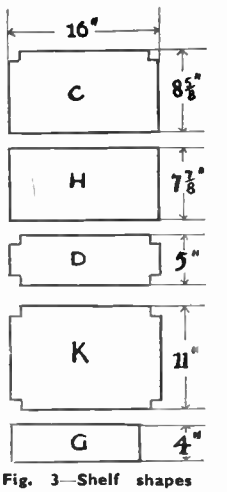


Fig. 3—Shelf shapes

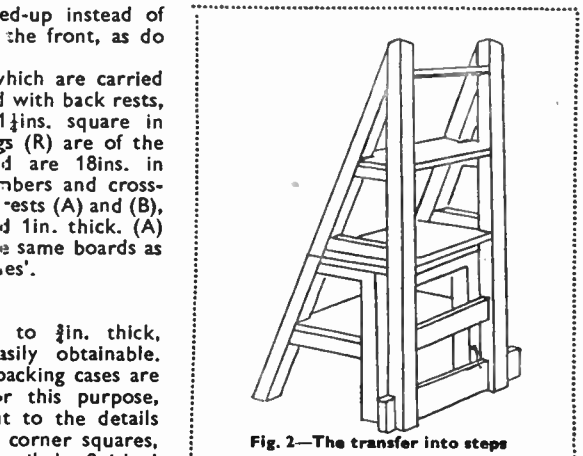


Fig. 2—The transfer into steps

of the seat to the extreme end of the back legs will determine the length and angles of the diagonal supports (S). These should be cut and fixed temporarily into position so the corresponding angles can be marked direct on to the horizontal supports when they are laid in place. In this way any slight differences and inconsistencies, which so often occur when working with odd pieces of reclaimed wood, will be automatically adjusted.

Sides Assembly

When the measuring has been completed, the seat can be knocked free of the legs and one side of the hinges unscrewed. The four sets of side supports should be assembled as separate units. Joints may be tenon and mortise, dowels, or halved joints, according to preference or ability.

If tenons or halved joints are decided upon, due allowance must be made during measuring for the necessary addition to the length of the various members. Dowel joints are recommended as being the most simple, and they are the type of joint most widely used by standard chair manufacturers. Details of the joining is shown in Fig. 4.

While the side assemblies are set aside for the glue to harden, the back

(*Continued foot of page 404*)

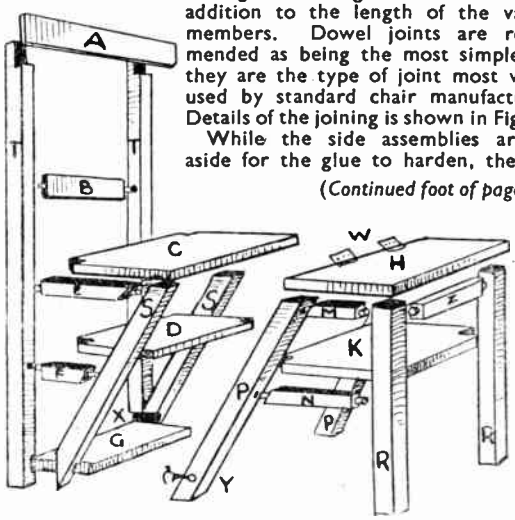


Fig. 4—A broken view showing general construction

Make for yourself this really practical
LEATHER POUCH PURSE

A GOOD leather purse is a sound investment. Coins placed loose in the pocket can easily be lost. The purse described here can be made in an evening without any special tools; it is easy to open, very roomy, and will last for many years.

You will need a small amount of thin supple leather, which you can obtain from several sources. Many leather shops sell leather pieces by the pound very cheaply. A pound of these pieces would supply you with sufficient material for several purses and other articles, too.

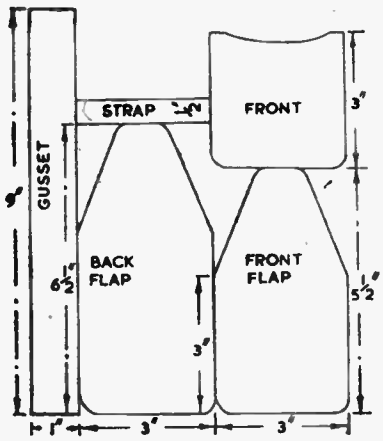


Fig. 1—Outline of shapes of parts

A discarded hand bag usually provides very suitable leather. You could, of course, buy a skin or half a skin from a leather dealer, if you have some use in mind for the remainder of the leather.

The drawing at Fig. 1 shows the measurements of the pieces required. In pencil, mark the outline of the parts on the inside (rough side) of the leather. If the material you have is crumpled, flatten it with a warm iron before marking. Cut out the pieces with a pair of scissors, a razor blade, or a sharp knife and round off the corners, where indicated, by cutting round a penny.

The Purse Portion

Next 'construct' the purse by sticking the parts together, using glue, or rubber solution. If you use glue, leave the pieces pressed together until firmly stuck. When using rubber solution, coat each surface separately and allow to dry. Then press the two surfaces together and they will adhere. When applying the adhesive, coat only the extreme edges of the parts to be joined. Always apply glue very thinly.

First of all stick the front to the front flap. Note that the inside of the leather of each piece should come face to face. Then stick on the strap about 1in. from the top of the front.

Fixing the Gusset

Fix the gusset on next. Coat one long edge with glue or solution, applied on the rough side of the leather. As the gusset will have to be stuck on to the shiny side of the leather of the front flap, roughen the edge of the latter to make sure they stick firmly.

Stick one end of the gusset to the front flap, exactly on a level with the front piece. Then work round the purse. You will have a bit of gusset 'to spare' but this can be trimmed afterwards.

By now you will have the front flap, front, strap and gusset complete. The only remaining part of the purse to fix on is the back flap. Do not put this on until you have stitched up the front parts. Although we say stitched, you may prefer to thong your purse. You could, of course, get it done with a sewing machine. By far the best method is to make a professional job of it and stitch it with thread. It is very easy to do, and the stitching will last as long as the purse.

With Two Needles

For this you need two needles and about 4ft. of thread. Ordinary strong cotton would do, but thick button thread, or cobbler's thread makes a stronger purse.

Make a series of holes around the three sides of the front which you have glued, about $\frac{1}{10}$in. from the outside edge, and the same distance between each hole. Use an awl, or the point of a pair of compasses. During this operation place an odd piece of wood underneath, or the dining room table may suffer.

Next, thread your needles, so you have a piece of thread with a needle at each end. Push one needle through the top hole and pull until there is an equal amount of thread on each side of the hole (see Fig. 2).

Then push one needle through the next lowest hole, and follow by pushing the other needle through the same hole. Pull tight and continue this process until you reach the third hole from the other end. Finish off by using only one of the needles, as seen in Fig. 3. The reason for this is to prevent the knot from causing weakness at the mouth of the purse.

Tie the two ends of the thread together, using a double knot. If you use your ingenuity you can arrange that the knot is hidden, by separating the layers of leather, and tucking the knot inside.

Back Flap

Now stick on the final part—the back flap. You should do this carefully, or the purse will look lop-sided. To make sure


Fig. 2—Sewing with two needles

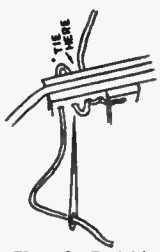


Fig. 3—Finishing threads

of a perfect fit, draw a pencil line right across the back flap, exactly 3ins. from the bottom. Make the top edges of the gusset (trimmed to size) meet this line.

Stick the inside edge of the gusset to the inside of the flap. Then stitch up in exactly the same manner as for the front part. You will notice that the edges of the leather, where it has been cut, are whitish in colour. Make these edges the same shade as the purse by wetting a piece of waste leather and rubbing it over them. Some of the dye will come out on to the white surfaces.

Your purse is now ready for filling with money! Use the front compartment for notes (if any), stamps, bus tickets and so on; the main pocket for coins.

Step-ladder Chair—(*Continued from page 403*)

rests (A) and (B), together with the front rail (Z), can be prepared. The 'shelves' (D, K, and G) should be squared-up and the corners taken out to fit their corresponding support sections.

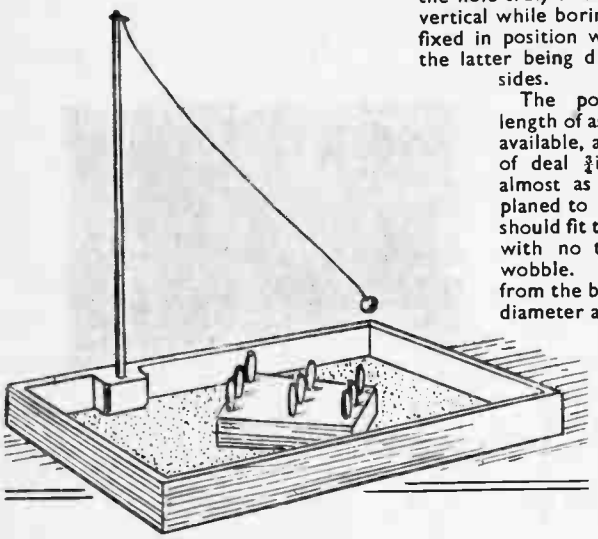
The assembly of the back half of the chair is completed by first fitting the back rests (A) and (B), following up with the half seat (C) and the lower shelf pieces (D) and (G). The larger pieces, (C) and (D), are fixed in position by either nailing or screwing them to their respective supports, but the narrow piece is finished to fit into grooves ¼in. deep cut on the inside of the assembly, so that it is 3ins. from the floor when the chair is standing. (Fig. 4, X).

In the front half, the front rail (Z) is fitted first, after which the half-seat (H) and shelf piece (K) are screwed or nailed into position. The two completed units are then brought together and joined up by means of the two hinges (W). A small box hook (Y) is fitted across the join of the diagonal supports (S) and (P) to keep the hinged units together.

The chair is now complete as it appears in Fig. 1. By simply disengaging the box hook and bringing the back of the chair over on its hinges, the chair is changed immediately into the step-ladder shown in Fig. 2. There is no need for any of the family to continue the dangerous practice of 'standing on a chair', for the step-ladder is always available whenever it is needed.

There is always fun and games if you make a set of

TABLE SKITTLES



THIS is a most interesting table game, both for the home and clubs. It is not difficult to make and well worth the little trouble involved for the pleasure afforded. All measurements conform to the rules laid down by the Leagues, so readers can practise at home and gain some additional skill for competitions, where such are held.

The table, Fig. 1, is made to dimensions given from ½in. thick wood. The frame can be just butt jointed at the corners, or tongued and slotted if a more professional method is preferred. The bottom can be of stout plywood or any such wood available. It is glued and nailed on.

The Pole Block

To the left hand side, at about 7ins. from the front inside surface, the pole is to be fitted. A wood block is provided to hold this in a vertical position, as seen at Fig. 2. The block can be 2ins. long, 1½ins. wide, and, say, 2½ins. high. In the centre of the block a hole ⅜in. diameter is bored right through for the pole.

As this hole must be truly vertical, it will be best to bore it from both top and bottom, half-way through each time. Take some care to mark the centres for the hole truly in line, and hold the drill vertical while boring. The block can be fixed in position with glue and screws, the latter being driven in through the sides.

The pole is, preferably, a length of ash, but if that is not available, a straight grained strip of deal ¾in. square will serve almost as well. It should be planed to a round section and should fit the block quite snugly, with no tendency to shift or wobble. It is then tapered from the block upwards to ½in. diameter at the top.

A swivelling arrangement for the ball is to be fitted. In the professional article this is usually a ball-bearing fitting, but one quite effective for our purpose can be made in the following more simple way. From a piece of stout sheet brass ½in. wide cut a strip to shape at (C). In this bore a small hole near one end for the string, holding the ball, and another, ⅜in. from the opposite end to fit on the post.

Now provide a ⅜in. disc of thin metal, drill a hole in the centre of this, then 'dish' it to a curve, as in detail (B). The dishing here is rather exaggerated, but will show what is meant. If the disc is placed on a piece of hardwood and given a few blows with the rounded end of a ball pane hammer, it will be dished quite enough for the purpose. In the absence of a ball pane hammer, any piece of metal with a rounded end would serve for the job.

Metal Fittings

For metal fitment to spin on, a suitably sized round-headed brass screw will do for a pivot. The whole arrangement is shown at (A). First place the dished disc on the top of the pole, on to this drop piece (C). Place a thin brass washer under the head of the screw, and push the latter through (C) and (B), then drive it into the pole. See the swivelling fitment (C) is loose enough to swing round at a touch of the finger.

The ball is a wooden one 1½ins. diameter, provided with a tiny screw-eye to which the string can be knotted. Whipcord would do for a string, and this should be neatly tied to the ball.

The skittles will stand on a block. This is generally a solid piece of wood, cut to the dimensions given at Fig. 3. If a piece of hardwood of this thickness is not easily obtainable, make up a box, as in the sectional view, of the given size, and fill it with dry sand to add some weight to it and prevent it easily shifting as the skittles are knocked off it.

The top and sides of the box should not be less than ½in. thick; the bottom can be thinner, and should be nailed and glued on after the box has been filled up with the sand.

Skittles Position

The position for the skittles can be marked by small brass-headed nails driven in at the spots shown, one at the centre of the block and the other at 1in. in from the edges. Mark them accurately in pencil first before driving in the nails. Those very small cup-headed brass chair nails would do nicely.

For the skittles, plane some pieces of hard wood to 1⅛ins. diameter and cut into 3½in. lengths, nine being required. It is really essential to use a hardwood for these as they have to endure a lot of knocking about, naturally.

The bottom ends should be quite flat, even a little concave would be better, to stand well, and in the centres of the bottoms, a small depression is worked to clear the nail heads they will stand over. These depressions can be easily worked with a countersinking tool. Taper the skittles from the middle to ¾in. at the bottom and ⅝in. at the top, or thereabouts.

Now thread the cord of the ball through the swivel (C) and adjust the length of it so that the ball strikes the skittles about midway, and not the block. The skittles can be given a coat of polish or varnish, and the block and tray be stained and polished, as well. The name of a firm supplying ready-made skittles is obtainable from The Editor.

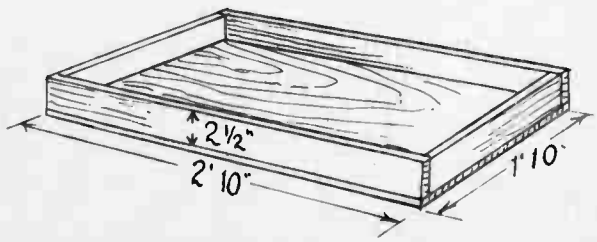


Fig. 1—Dimensions and construction of base box

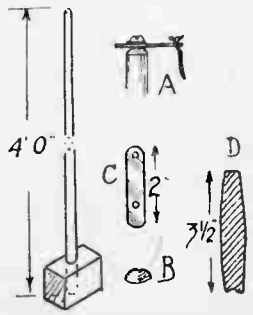


Fig. 2—Pole and parts

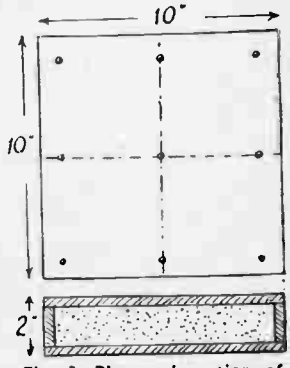


Fig. 3—Plan and section of skittle base

Here are full directions about the art of

SILVER SOLDERING

ALMOST anyone can do the simple job of soft soldering with comparative ease, but they seem to fight shy of tackling the art of silver or hard soldering and brazing. This is rather a pity as there are so many small jobs that would be so much better and stronger if silver soldered instead of being soft soldered.

It is not at all a difficult art to acquire and is well worth the short time needed to learn to do it successfully. To the jeweller or silversmith it is of vital importance to be able to do silver soldering with ease, and any handyman could earn a nice little income by doing it.

The Principal Needs

No special workshop is needed and an ordinary table may be used to do small jobs on, although access to a gas point is a great asset for larger jobs. The tools and materials are simple and the few you will want can be bought quite cheaply.

If you propose using a table it would be a good idea to have a piece of board to work on unless you have an old table which you can use specially for the job. A piece of ply about 24ins. to 30ins. long and about 18ins. wide will do nicely.

The source of heat to start with can be a simple spirit lamp shown in Fig. 1 burning methylated spirit, and which gives quite a hot flame and much useful work can be done with it, in fact, many jobbing jewellers seldom use anything else.

Heating

A considerable amount of heat is required, a lot more in fact than is needed for soft soldering, so in order to increase the heat of the spirit lamp, which would not be sufficient if used alone, a blowpipe is needed. A mouth blowpipe of brass, Fig. 2, about 9ins. long can be bought from an ironmonger or craft shop very reasonably. A block of charcoal or pumice stone about 4ins. to 6ins. square and an inch or two deep to hold the work on and also to help build up the heat is another cheap item to buy.

The Solder

A pair of tweezers and a pair or two of pliers and cutting nippers should find a place on the work board. Silver solder is made in small thin sheets and is obtained from an ironmonger or you would probably get a better selection and perhaps a little advice about it from a jobbing jeweller or silversmith. Ask for low melting point or easy running silver solder.

The flux used to make the solder run in properly is ordinary borax, which can be used either in lump or in powder. If you use lump, and this is the usual method, you will want a piece of slate about 3ins. square to mix it on. This completes the list of essential apparatus needed for silver soldering and we are therefore ready to try our first job.

Let us suppose that we are making a chain from silver jump rings as mentioned in the recent article on Jewellery and in order to make it stronger we are going to solder all the joins in the rings. Silver is the easiest metal to work and solder, so we should not have much trouble with the job.

Cleanliness Important

The first thing to do is to see that the parts which require soldering are perfectly clean. This is a very important point and much of the success of the job will depend upon it being carefully carried out. A few small needle files of various shapes are very handy for cleaning up small parts, but an ordinary pocket knife will probably be found the most useful.

When you have cleaned all parts that are to be soldered do not touch them with your hands as the natural grease from your skin is quite sufficient to stop the solder from running where it is wanted. You should get into the habit of picking up all small parts with a pair of tweezers. You may find it a bit tricky at first, but after a while it will come as second nature to you.

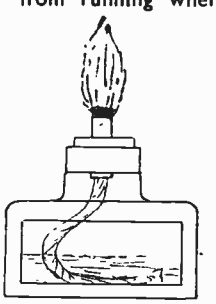


Fig. 1—Section of lamp

Fig. 2—The pipe

Fig. 3—The joint

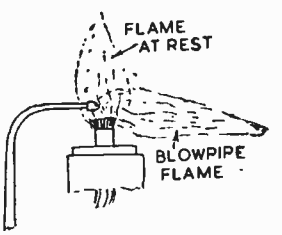


Fig. 4—Use of blow pipe

Preparing the Flux

Next prepare the flux by placing a lump of borax on to the slate, add a drop or two of water and rub the lump round until you have a thin creamy solution. Break off a few pieces of solder with the pliers about $\frac{1}{16}$in. square and place in the flux.

Put a dab of flux on the join of the jump ring, and then with a knife open the ring slightly and place a piece of solder between as shown in Fig. 3. It would be as well now to stress a very important point—all joints that are to be hard soldered should fit as tight as it is possible to make them, for the solder will run into a crack however small, when the job is properly heated. By this method you get a much stronger joint than if you had left an open air gap between the ends.

Now place the ring on the charcoal or pumice stone block and with the blowpipe direct the flame of the lamp on to the ring, see Fig. 4. Blow gently at first and gradually heat up the job, increasing the blowing and heat until the solder runs into the join, when you can cease blowing.

The heat of the flame can be increased by blowing a little harder and also by altering the position of the blowpipe in the flame. The position shown in Fig. 4 is the hottest part of a spirit lamp, and by raising the blowpipe you will be using a cooler part, which you need for small jobs.

How to Use a Blowpipe

To use a blowpipe successfully you should learn to control the breath and blow in long steady blasts and not with short jerky ones. Remember never to direct the flame on to the solder until the surrounding metal has been heated sufficiently—until it is nearly the same heat as the melting point of the solder. It is very interesting to watch the progress of the job.

Apply the flame successively to both sides of the join. By gradually increasing the heat, the job and solder will become red hot. Then a little more heat, and white heat is nearly approached. Now at this point the solder will suddenly disappear—it has in fact run into the joint and you will know that you have made a satisfactory and strong job.

It is indeed quite a thrill when the solder takes on a somewhat luminous appearance and then vanishes. While the article is still hot it should be dropped into a pickle made of 1 part of sulphuric acid in about 10 or 12 parts of water (Remember when mixing this solution to pour the acid slowly into the water and never the reverse way).

This pickle helps to remove the hard scale which forms during soldering and very much eases the process of cleaning up the join, and it also greatly improves the colour of the metal. It is only necessary to leave the job in pickle for a minute or two, afterwards rinsing in clean water and drying.

(*Continued foot of page* 408)

Just the thing for a young man to make—a

BEDSIDE CLOTHES STAND

THE question of where to put one's clothes at bedtime is generally quite a problem. Very often they get thrown over a chair or even on to the bottom of the bed. This is really very untidy and unhygienic. Clothes have more often than not absorbed a certain amount of perspiration during the day, and if they are hung properly when you take them off they will have aired and be fresh to put on in the morning.

The bedside stand described here was devised by the writer and has been very efficient in carrying out all these requirements. There is a shaped hanger at the back for coat and waistcoat, while underneath the top of the stand are two bars.

The back one is a fixture for hanging your trousers on, but the front one, which is for your shirt, is hinged and will swing out so you can get at the back bar easily. Along either side is a short bar for collar, tie and socks, whilst room is made for shoes on the rack at the base.

There is plenty of room on the top of the stand for a bedside lamp and a book or two, and underneath two shallow drawers will hold any odds and ends such as collar studs and tie pins.

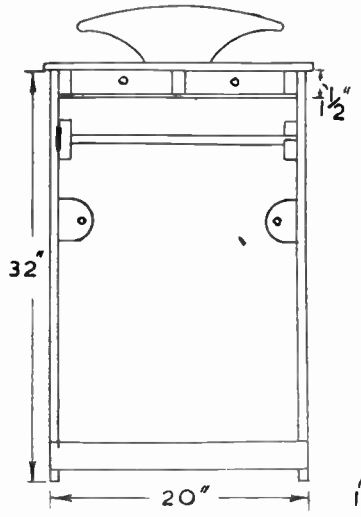


Fig. 1—Front view showing parts

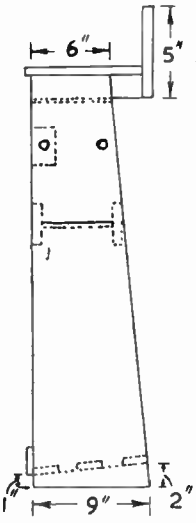


Fig. 2—Side view

The Wood

The most suitable wood is a hardwood such as oak, walnut, ash or mahogany, but if this is difficult to obtain, any other kind of wood may be used and stained to suit. It would be nice, however, to make it to match the other furniture in the bedroom, but that is a matter which you must decide yourself.

For the top a piece of wood 21ins. long, 9ins. wide and ½in. thick is suitable. Or you may glue two pieces together and cut to form the shape shown in Fig. 3. It is cut this shape to allow the coat to drape over the hanger correctly. ½in. wood is also suitable for the two sides, although you may use it a little thicker if you prefer the job to be stronger.

You will see from Fig. 2 that the narrow ends of the side pieces are cut 6ins. wide to fit the top of the stand, while the base is increased to 9ins. to enable it to stand firmly. The length of these pieces is 32ins.

Extra strength can be given in fastening the top and sides together by crossbars 6ins. long and 1½ins. wide glued along the top edges. The top is glued down on to these and secured with small panel pins.

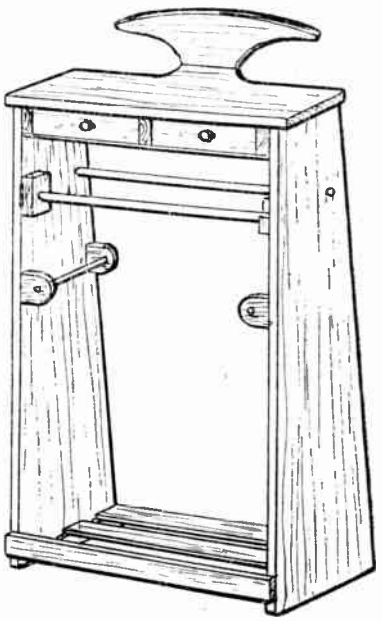
Shoe Rack

It would be as well to fit the rack for the shoes next—this will help to hold the framework together. It will be seen from Fig. 2 that the rack slopes upwards towards the back to allow the air to circulate round the shoes better. If you had got them wet they will then have a better chance to dry out during the night.

Two pieces of ½in. wood 9ins. long, 2ins. wide at one end and 1in. at the other are glued to the base of the side boards, and the three slats are fastened on to them. Make them 19ins. long, 2ins. wide and ½in. thick, which will leave 1½ins. air space between them.

Another strip 20ins. long and about 2ins. wide is fastened right along the front to keep the shoes from slipping off and also to make the job look more tidy. The coat hanger part would be better made of ¾in. wood 16ins. long and 5ins. wide and cut similar to the pattern shown in Fig. 1. The shape of the curves is not important, although the top should not be cut too sharp or the coat may slip off.

Extra strength will be needed with this piece, and it can be obtained by the aid of a supporting bar, which not only holds the hanger firm but keeps the top board flat and also acts as a partition to the two drawers. A piece 9ins. long, 1½ins. wide and 1in. thick will do nicely. By fixing a piece of thin ply to the three bars on the underside of the top board you have the foundation for the drawers and can get them made and fitted.



Hardly any description is necessary for this drawer which is a fairly easy job—just a piece of thin ply for the bottoms and with the sides and ends glued on to them. If you are good at dovetailing you may like to use that method. The drawers can be any depth up to 6ins. Two knobs and, of course, the necessary stops at the back will complete the job.

Cross Bars

We are now ready to fix the various bars. The two top ones can be made of ¾in. dowel rod; the back one, which is a fixture, about 1in. from the back and 3ins. down from the bottom of the drawers. Drill holes right through the sides and glue in position. The front bar is fixed into a small block of wood 3ins. long, 2ins. wide and 1in. thick. This is hinged to the side of the stand, as shown in Fig. 4. The free end of this fits into a kind of latch fixed on to the opposite side of the stand; the shape and size will best be seen by referring to Fig. 5.

The small bars fitted to either side are glued into blocks of wood as shown in Fig. 6.

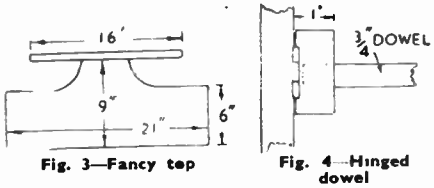


Fig. 3—Fancy top

Fig. 4—Hinged dowel

Fig. 5—Dowel holder

Fig. 6—Bar support

Temperature can be correct and maintained with an electric PHOTOGRAPHIC WARMER

AMATEUR photographers who do their own film and print processing are well aware of the importance of correct developer temperature. Cold developers are extremely sluggish and unreliable in action. This is particularly so in the case of gaslight paper, where slow development produces flat, lifeless prints. The fixing bath must also be at the correct working temperature, otherwise the fixing may be unduly prolonged and adversely affect the permanence of the finished film or print.

The correct working temperature of developer and fixing is approximately 65 degrees F. and this can be efficiently maintained with the electric dish-warmer as illustrated in Fig. 1. Fig. 2 clearly indicates the constructional features of the dish-warmer. The overall dimensions are 14ins. long by 8ins. wide by 4¼ins. deep, which will be adequate for all normal requirements.

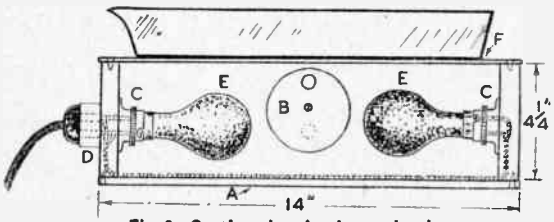


Fig. 2—Section showing lamps in place

To construct the sides of the warmer, two lengths of ½in. thickness wood, 14ins. by 4¼ins. are butt joined with brass screws to the two end pieces. The dimensions of the end pieces are 7 ins by 4¼ins. by ½in. thick. A smooth piece of wood, 14ins. by 8ins. by ¼in. thick is next required for the base (A). This is screwed into position with small brass screws.

Control Unit

The heat control unit (B) is constructed from a discarded wax or shoe-polish tin. Fig. 3 clearly indicates the constructional features. Two ½in. diameter holes are drilled in the tin, one in the lid near the edge, the other, diametrically opposed, in the tin bottom. The relative positions of the holes are shown in Fig. 3 (A & B).

A small hole is next drilled in the centre of the lower half of the tin, which is then temporarily screwed into position midway on the side of the dish-warmer. The tin is then turned until the hole in same is in the lower position. A ½in. diameter hole is then drilled through the side, concentric with that of the tin. The lid is then replaced on the lower half of the tin to complete the heat control unit.

To obtain the maximum heating value, the unit is turned until the hole in the side is closed. Between the closed and fully open positions, one can adjust the unit to obtain the correct working temperature.

Two suitable electric bulb holders are next screwed into position, (Fig. 2C) and are wired together in parallel. If possible, asbestos-covered insulated wire should be used, to preclude the possibility of damage to the insulation from the heat of the lamps. The design can of course be simplified by using one holder and bulb, the bulb being of course equal to the combined wattage of both the smaller bulbs. The heat, however, is concentrated in only one part, whereas with the employment of two bulbs, the heat is much more diffused.

A 5 amp. plug holder is next wired up to one of the bulb holders and screwed into position, Fig. 2 (D). Two 25-watt electric bulbs, see Fig. 2 (E) are next installed and the heating plate, Fig. 2 (F), screwed into position with small brass screws. The heating plate can be made from either brass, copper or stainless steel, 14ins. by 8ins. by ⅛in. Do not, however, use aluminium for this purpose, as any spilt developer, being strongly alkali, will immediately attack and corrode the metal.

A connecting plug is wired up with a suitable length of flex and the dish-warmer is completed. It is not advisable to paint the dish warmer, as when in use the paint is apt to soften with the warmth and give an objectional odour. If it is smoothly glasspapered, the appearance is quite pleasing and is quite easily cleaned when required.

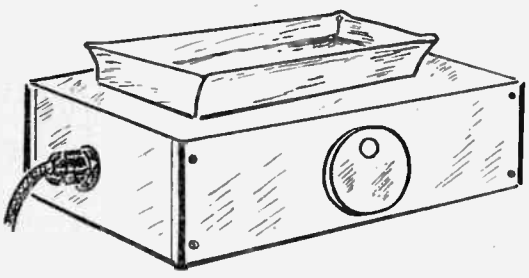
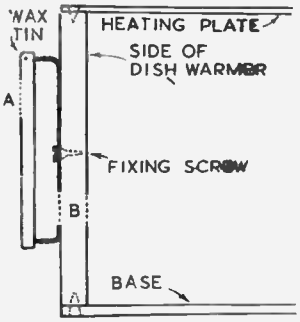


Fig. 1—Complete unit in use

How to Operate

To operate the dish-warmer, the dish of developer is placed on the heating plate, the connecting plug inserted and the heat control unit fully closed. After two or three minutes, the developer is tested with the thermometer and when at 65 degrees F. the heat control unit is partly opened and adjusted until the developer temperature remains constant.



Section showing the heat control

It must not be overlooked however, that during developing and printing a slight heat loss occurs through the contact of the cold film and paper with the developer. This should be compensated by very slightly closing the heat control unit, with an occasional re-check with the thermometer. This can be done without any trouble.

Soldering—(*Continued from page 406*)

Let us try now a rather more difficult task and solder up a seam in a piece of sheet metal. It would be good practice to make a silver ferrule to put on a walking stick. Cut a piece of silver, which is obtainable from a silversmith, about ¼in. wide and long enough to go round the stick.

Place a piece of paper round and make a pattern first. File the two ends square and perfectly level and curl up to shape on a piece of round wood. You should use a piece of wood smaller than the finished article is to be, so that the two ends overlap slightly. It will then be possible to snap the ends together and get a perfect fit with no air gaps.

A piece of thin iron wire can be put round and twisted up to keep the ends together when heat is applied. Scoop out a little sink in the charcoal block and put the ferrule here, then run a small quantity of flux on the join. Cut a few snips of silver solder, flux these and place about three along the join.

The heat of the blowpipe flame must now be applied very gently, first to dry the water out of the flux, then more heat to either side of the join. Be careful not to heat the solder yet or it may form a ball and roll off—that is why this job is more difficult than the last. If you are careful to heat the silver gradually to red and then a little more, the solder will flow into the crack quite easily. Do not go beyond this heat or the actual metal may melt.

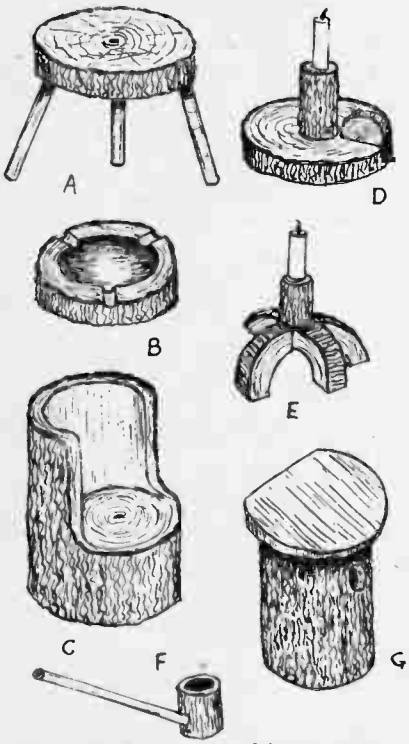
Place in pickle and clean as before. The finishing and polishing is quite an art in itself and must be dealt with in another article.

You can make lots of practical novelties by undertaking

TREE-TRUNK CARPENTRY

THERE is a tremendous lot of pleasure to be had from making furniture and gadgets from timber in its natural state. Tree trunk carpentry, as it is called, is an art that does not appear to be so popular as it deserves. It is possible to make some really useful and artistic articles from odd logs and branches of trees.

The work is not at all difficult and there is great scope for the handyman who will experiment and devise new designs. Much of the wood can be obtained from a timber merchant in the form of surplus offcuts, a bag of fire logs might even yield a few useful specimens; while a visit to the countryside should produce sufficient stock for all ordinary purposes.



The bark may be left on for some articles, or it may be stripped off and the wood polished, stained or varnished. The type of tree and the condition of the bark will generally determine this factor—some logs with a smooth solid bark look quite attractive left in the natural state.

Small Stool

The stool illustrated at (A) is quite an easy piece to start with and can be made from a 2in. slice off an oak, elm or beech tree. A piece 12ins. diameter is a suitable size, although if you intend to make a stool for children 9ins. would be ample. The thickness can be reduced to 1½ins.

Cut the three legs from dowel rod or a piece of broom handle about 1in. diameter and taper one end slightly. Drill holes three quarters of the way through the top so the legs are a tight fit, and tap home, applying a spot of glue if thought necessary.

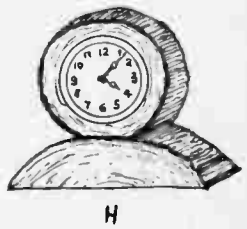
The legs can be made to fit at right angles to the top, but they are much safer and also look better if they are splayed just a little. If the stool is for use in the garden the bark can be left on, but for indoor use it would be better to peel off the bark, glasspaper smooth and polish.

Table Mats

Table mats can be easily made, but they should not be cut too thick or they will look rather clumsy. Special care will be needed in cutting thin slices, and here a well oiled sharp saw will make the job comparatively easy. For the round mats a good size is about 6ins. Quite novel oval mats can be made by cutting the wood at an angle of about 45 degrees.

Teapot and flowerpot stands are just variations of the table mats made to other sizes. They can be left quite plain or variety can be given by fitting feet of different patterns.

The ash tray shown at (B) is a very useful article to make, and gives good practice in the use of a gouge. About 4ins. diameter and ¾in. to 1in. thick is about right. As the wood is end grain the job will be a little more difficult and the best plan is to drill a number of holes and then cut out the surplus wood with a gouge.



A pin tray is made on similar lines to the ash tray, but is a little smaller and has not got the grooves cut in the rim. It does not matter what wood is used for these two trays, although a hardwood is to be preferred.

A Child's Chair

The 'easy' chair illustrated at (C) is a more difficult job to tackle; not so much in the skill needed but rather as a test of patience. It is, however, well worth the time spent in the making and it is really surprising how comfortable a chair of this type can be. It is an ideal chair for summer days in the garden, and one or two on the lawn are quite attractive. Children are delighted with the miniature ones made specially for them, and will spend many happy hours in them.

A timber merchant will be able to supply a log for the job—probably an odd end of a trunk unsuitable for cutting up into planks. It does not matter if it is a hardwood or a softwood—the difference will be in the time taken to cut out the wood, so, perhaps, a softwood would be best to start with.

A log 15ins. to 18ins. diameter and about 30ins. long will do for an ordinary size chair, while for a child's chair 12ins. diameter and 21ins. long will be ample. Commence by cutting out a quarter of the log, thus making it the shape of an 'L'. Do this by making a saw cut down through the centre, to be met by another cut halfway through the side of the log.

The Back

Next, the upper half of the log, which will form the curved back must be cut out with a chisel and mallet. A lot of time can be saved by drilling a number of holes with the largest bit you have and as close together as you can get them, and then chipping out with the chisel.

The seat can be left perfectly flat as in the illustration, or it might be thought more comfortable if made slightly curved. Do not cut the back out too thin, the actual thickness will depend somewhat on the kind and condition of the bark. Cut the wood as smooth as you can and give a final finish with glasspaper.

Quaint Candlesticks

The candlesticks illustrated at (D) and (E) are always useful articles to make, and quite easy too. The first one has a slice of about 4ins. diameter and about 1in. thick for its base and a piece of small branch for the stem. This can be any length to suit your fancy, and is either screwed on through the base or a hole can be drilled and the stem made a tight fit. A half circle of a small branch is fitted on the side to act as a handle.

The candlestick (E) is a little more tricky to make. Cut a slice about 1in. thick from a 4ins. to 6ins. diameter log, and cut this in half. Then cut out a semicircular piece from each, leaving the wood about 1in. wide. Join the two at the centre by cutting a slot half way through each—one from the top and the other underneath. The stem is screwed on from underneath, thus holding the two base pieces together tightly. The hole for the candle is bored out with a twist drill of the correct size.

Clock Cases

Clock cases made from small pieces of tree trunk can be very attractive and are easy to make. The one illustrated at (H) is for a small 2¼in. drum timepiece—the type that can be pushed in a hole from the front and secured at the back with two or three nuts.

Choose a piece of wood that will leave a margin of about 1in. round the clock, and slightly flatten the bottom. The semicircular base also has a flattened part

(Continued on page 410)

Modern chairs can be obtained from old style by this

CHAIR CONVERSION

DURING the immediate post-war period it was 'quite the thing' to furnish with second-hand articles, but now the situation has changed and second-hand furniture is no longer as fashionable as it was. Fortunately, most old pieces can be reconstructed to give them a more modern appearance at very little cost.

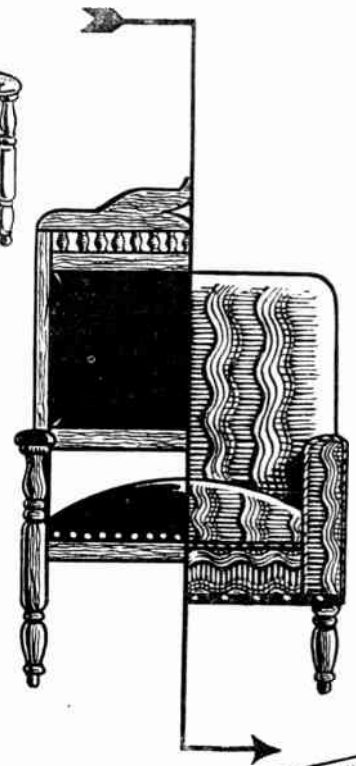
The Victorian high-back armchair pictured in the drawing is a good example of a suitable subject for simple reconstruction. Only two saw-cuts, and the addition of false seat-boards are necessary to completely change the style of this piece. Careful home-upholstering completes the transformation from the Victorian piece to a modern armchair of comfort and charm.

Upholstery

The first step in reconstruction is to check carefully the existing upholstery, replacing any stretched or rotten webbing, seating, all springs firmly, and patching any torn fabric. All joints should be examined, and any weak parts of the framework strengthened.

Removal of the decorated top is the next job. Most chairs of this type have a wooden frame inside the upholstered back, and before removing the top (by sawing through both sides), the outer frame should be screwed to the inner frame. This should make the back of the chair firm. If there is any looseness a piece of wood may be fitted across the top of the chair back, but the back should not be given any extra height if it can be avoided.

The next step in the process of reconstruction is to fit the false boards to give the seat an appearance of greater depth. Boards of suitable width and thickness should be fitted to the back, front and both sides of the chair under the seat. Fitting the false boards completes the constructional work, and all that remains is to pad and cover the chair.



Kapok, cotton waste or any other type of filler may be used for padding. Stout hessian should be used over the padding, and a suitable fabric for the final cover, or a slip cover can be made.

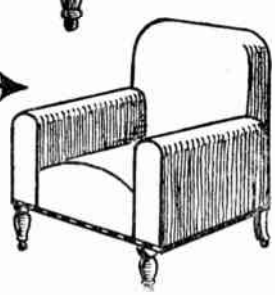
Fasten a piece of hessian, with stout tacks, inside the sides of the chair arms. Stuff padding from the outside to fill the spaces between the arm supports—using plenty of padding and distributing it evenly. Cover the outsides of the sides of the chair arms with hessian. Fill the space between the bottom of the chair back and the back of the seat in the same way, by tacking hessian each side of the aperture and firmly filling with padding. Any lumps can be smoothed out by pushing a steel knitting needle through the hessian and working it about to evenly distribute the padding.

New Chairs for Old

All that remains is to pad and cover the complete chair (except the legs). The chair should be carefully padded and strong hessian stretched over all the parts; the padding should be positioned to emphasize the outlines of the new-style chair, and particular care should be taken over the arms. The sequence for padding and covering is the seat first, then the back, finishing with the sides.

After padding and covering, the legs should be cleaned off and stained, and the casters checked to ensure that they work smoothly; the chair can be made to tilt back a little by shortening the back legs.

This is a very simple example of furniture reconstruction and modernization, and many other old-fashioned articles can be given a new look if careful consideration is given to the basic lines of old and new. The expense of reconstruction is not very great compared with the value and appearance of the new pieces — and — there is always the pleasure and satisfaction of a good job done well.



Like so many other things it only requires careful thought and preparation, which can be as much pleasure as the actual work involved.

Tree Trunk Carpentry—(*Continued from page 409*)

or the top to fit on to, which is glued and screwed down tight.

A small hollowed-out trunk is an ideal home for a bird, and a few nesting-boxes in the garden will prove a source of enjoyment to all bird lovers. For the cheeky little blue-tits the internal diameter should be 4ins. and the height about 7ins. Most of the hollowing-out will have to be done with a twist drill and chipping out with a chisel. The bottom can be made fairly level with a red-hot poker.

A sloping roof is fitted which overlaps the trunk by about 1in. The hole for the bird to enter should be near the top and for a blue-tit has a diameter of $1\frac{1}{16}$ins. to $1\frac{1}{8}$ins. The best place for a nesting box is on the trunk of a large tree and where the sun does not shine direct on to the box.

A very simple hanging bird-table can be made from two circular slices of trunk held apart with three chains fixed into screw eyes. If the distance between the two is not more than 5ins. or 6ins., you will keep the larger greedy birds away.

The pipe smoker will revel in the variety of pipes that he can easily make. Cherry wood is the recognised best wood for the purpose, but experiments can be carried out with many other kinds. No definite sizes can be given as each smoker has his own fancies, both as regards size and design. The illustration at (F) shows a favourite pattern.

Only a few of the very many articles that it is possible to make by tree trunk carpentry have been described in this article. The keen handyman will be able to devise many more to adorn the home and garden, and also to form really attractive gifts, the giving of which will afford as much pleasure as the receiving.

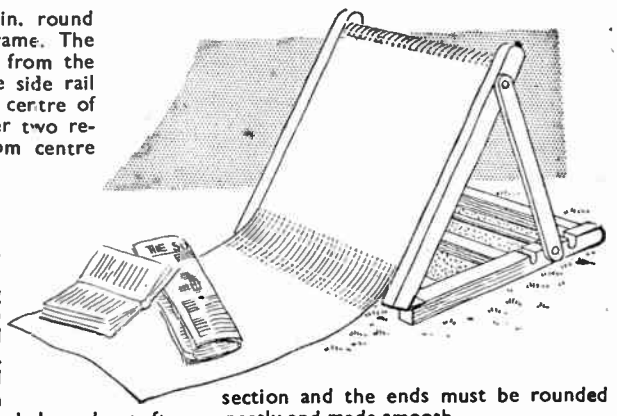
Keep your eyes open in the country for suitable odd pieces which may lend themselves to this type of work.

A simple to make, and convenient to carry folding
LAWN OR BEACH REST

IT may seem a little early yet to talk of sitting or lounging about out of doors, but if one is thinking of making or preparing chairs or tables that are to be used wholly in the open, now is the time to start work upon them. For sitting on the lawn, or indeed, on the beach come to that, a back rest such as that illustrated in Fig. 1 will be the thing.

The finish to be put upon it should be appropriate to its use, viz., a good carriage varnish which will withstand heat as well as moisture and exposure.

As Fig. 1 shows, the Rest is made to fold flat when not in use. The canvas covering and seat protection, which is all in one length as shown, can also be folded conveniently.



Ground Frame

The serviceable wood to use would be American Whitewood, beech or birch, all both close grained and hard of surface. The ground frame can first be taken in hand, and the detail Fig. 2 gives a good idea as to its form and construction. The side view, Fig. 3, of the Rest shows this frame in position with the back rest and support frame in place.

There are two long outside rails measuring 22ins. long by 1½ins. square, and three cross rails, each measuring 1½ins. square. To make a sufficiently strong job of the frames they should be mortised and tenoned together. A stub tenon can be used in all cases, or better still a through tenon, meaning, of course, that the tenon runs through the full width of the rail with the ends of the cross rails showing on the outer face of the long side rails.

The method of making the stub tenon is shown in Fig. 4, the ends of the cross rails being shouldered and with the tenon running half way through the long rails. The cross rail (A) in Fig. 2 should stand 2ins. in from the ends of the long rails, while rail (B) should be 6ins. from (A). The end rail (C) should be at least 1in. away from the rounded ends of the side rails.

Recesses into which the round rod of the support frame must rest, are made as shown in Fig. 3. Each recess is ⅜in. deep with rounded end and should be ⅝in. wide to take ½in. round rod of the support frame. The end recess is 3¼ins. from the rounded end of the side rail measured from the centre of the recess, the other two recesses are 2¼ins. from centre to centre.

They are made by first boring holes in the centre of the depth of the rails with a ⅝in. centre bit and then cutting down from the top face of the rail until the hole is reached. This cutting should be neatly cut with a small tenon saw and cleaned out afterwards with glasspaper. Care must be taken to see the recesses in both rails are identical and exactly opposite each other.

Back Frame

The back frame to which the canvas covering is later attached, is shown in Fig. 4. This frame is exactly the same width as the ground frame, viz., 16ins. full width with a space of 13ins. in between rails. Note the positions of the three cross rails in this frame. The middle rail is 9¼ins. up from the square ends of the side rails. The cross rails are 2ins. by 1½ins. in section, while the side rails are 1½ins. square, and all stub tenoned and mortised together just like the ground frame. Take off all sharp edges and corners of all the rails with glasspaper.

Both frames having been completed, the next job is to hinge them together. A pair of 1½in. brass hinges should be strongly attached to both frames in the manner shown in the side view Fig. 3. The flaps of the hinges are cut in or recessed so they lie flush with the surface of the rails.

The adjustable frame to support the back consists of two side rails and a length of ½in. round rod, the latter being let into the side rails to rest in the slots in the ground frame. The side rails are to be 19ins. long by 1½ins. by ⅞in. in section and the ends must be rounded neatly and made smooth.

At the top end of the rails bore holes ⅞in. down to take 1½in. round-head screws. The screws should be free in the holes and to prevent undue friction on the rails thin washers should be included under the heads of the screws. Holes should be made in the lower ends of the side support rails with ½in. bit and the rod cut to length 17⅝ins. long. Glue the ends of the rod firmly into the rails and clean off the ends neatly with glasspaper.

A piece of ordinary deck chair canvas about 4ft. long and 13ins. wide will be needed, with about half-a-dozen large-headed tacks, those with a leather or fabric covering being best for the job. The canvas should be brought round the top rail of the sloping frame and nailed on the underside or face of this rail.

There are two or three ways of finishing the woodwork. Many will leave the wood in its natural state, others will, no doubt, prefer a good coating of varnish to preserve the wood, while others again will follow the natural craze for colour, and paint the frame some bright and attractive colouring.

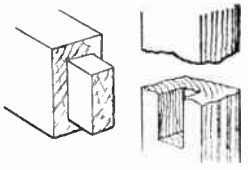


Fig. 4—The tenon joint

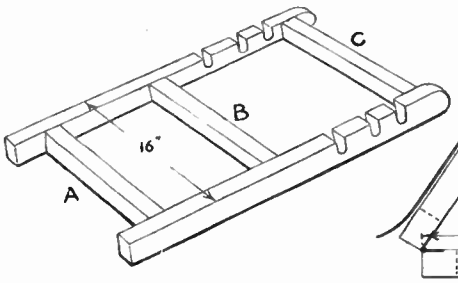


Fig. 2—The frame on the ground

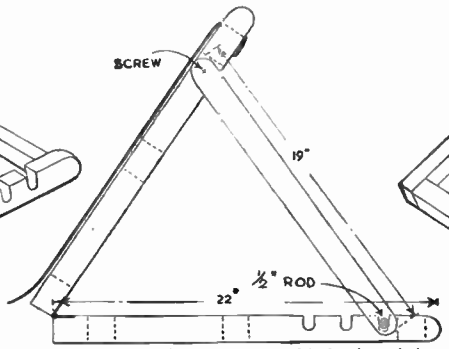


Fig. 3—Side view showing adjustable back and slots

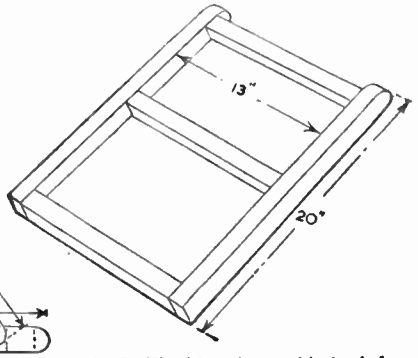


Fig. 5—The hinged movable back frame

Patterns are given on page 413 for this miniature R.A.F.

MODEL OIL BOWSER

THE type shown and explained here is the general Oil Bowser used on all the large 'dromes. Note that there is not quite the stagger on the window at the front, the bonnet is more square and it has not quite the well-domed roof as in the other vehicles in this series. The full size patterns are shown on page 413.

The chassis (No. 1) construction is simple, being made from two lengths of good clean strip wood 4⅜in. long. Make these with $\frac{3}{16}$in. by ⅛in. wood with cross struts every inch along measuring $\frac{7}{8}$in. long. These can be of the same wood.

Note in the sketch that the sections are split up as follows—bonnet $\frac{7}{8}$in., cab 1⅛in., tank 2in., cabinet for equipment and controls ⅜in.

Start from the front and make the bonnet from a small block of wood (No. 2). This is $\frac{7}{8}$in. long, ¾in. high, $\frac{7}{8}$in. wide. It is shaped off in straight sections on the top, and the front is finished with a ¼in. band of cardboard (No. 3). The front can be finished with a card frame, as shown, to represent the radiator which is fitted right to the front of chassis bars. A special picture is shown in (No. 4) as this vehicle has a stand-up guard rail fitted at an angle as shown. Panels for inspection of engine can be made from cardboard, and painted as shown.

The cab is next to make with the floor (No. 5) 1⅛in. deep by 1⅛in. wide at front and 1¼in. at back; it is a little narrower in front. Now make the roof from ¼in. wood to allow for sanding exactly the same size (see No. 6) sloping as shown in (No. 7). The sides (No. 8) are fairly straightforward, being 1⅛in. by 1¼in. with square windows ¼in. by ¼in. placed $\frac{3}{16}$in. from the roof.

The back (No. 9) can be made from plywood and be 1¼in. wide by 1¼in. high so you can sand this off to come flush with the back top of roof which will slope up a little, as seen in the sketch.

This type of vehicle has a protection between cab and container, and you can provide for this by adding another ¼in. section under the chassis with a cut-out to fit round the main chassis (No. 10).

The front is simple being quite square with no stagger. Make it in thin plywood, size 1⅛in. by 1¼in., and if you cut right round the window sections (No. 11) you can then replace the divisions with cardboard suitably cut. Sketch (No. 12) shows what is meant by this.

Such planning will enable you to mount your windows with transparent material and cut the edges clean without trouble.

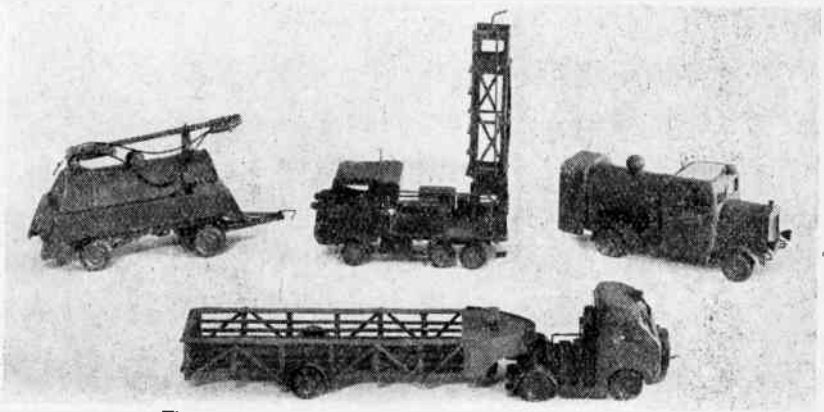
The container needs two supports from ¼in. wood at least. These should be 1⅛in. wide and 1¼in. high as in sketch (No. 13). Space out to 2in. and bind round with thin card or tin. A rounded dome ½in. in diameter must now be fitted and this finished off with a strip of thin card ⅛in. wide to form the rim. Four bearers are wanted to hold the container shaped out as shown in (No. 14).

Control Cabinet

In (No. 15) is shown the control cabinet which fits at the back of the container. This is from plywood 1⅛in. high by 1¼in. wide, rounded on the corners. This is then fitted with a strip of card ⅜in. wide which goes up the side, along the top and down the other side.

Make a strip of wood 1⅛in. wide and ⅜in. deep to fit in the base. Paint the inside of this white and make a panel of small wheels and pins to represent the controls. You will now require a panel as seen in (No. 16) which would be best cut out in thin plywood. Line this with thin Cellophane.

The full lay-out of all assembled parts is seen in the sketch (No. 17). Note position of wheels, mudguards and the small steps on the rear guards. A short running board is mounted between rear mudguard and back of cabin. Small tool-box is also carried here. Model should be painted in green or grey.



These are the models made from this series of articles.

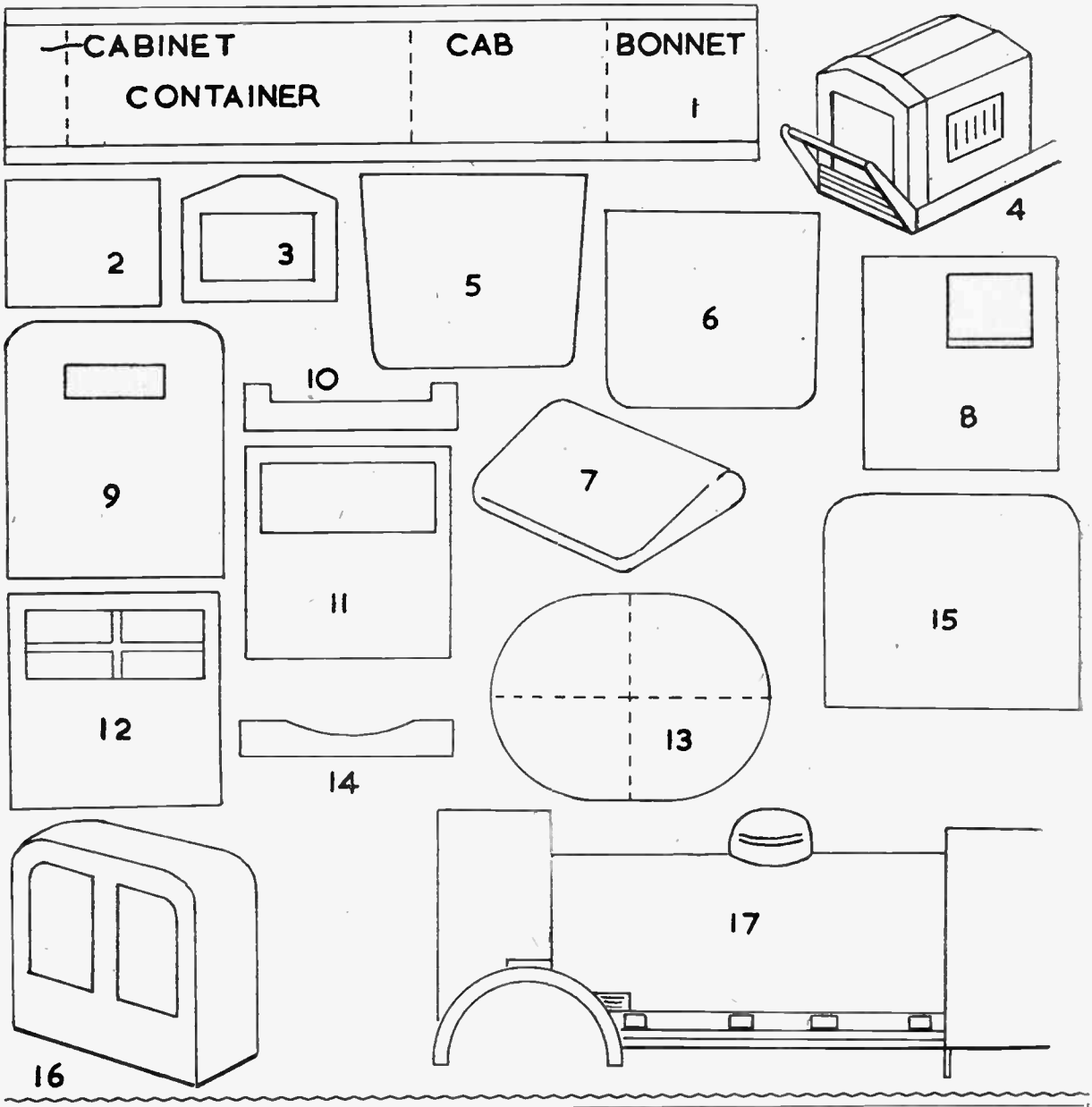
Two Model Exhibitions worth Visiting

READERS in London and Sheffield districts will be interested to hear of two Model Exhibitions which they will find worth while making every effort to attend. The Model Railway Club is holding its annual Exhibition at the Central Hall, Westminster, London, from Tuesday, April 11th until Saturday, April 15th. This year the number of models will exceed 3,000 and will include a comprehensive display of models of the former Railway Groups. The exhibits will include models of locomotives, coaches, wagons, stations, building and line side gadgets. Other sections will show points and track lay-outs, free lance models and models under construction so that methods and craftsmanship may be studied. In addition, a large working model Railway staged by British Railways, and many other working track lay-outs of different gauges.

At Sheffield it is the Annual Easter Exhibition of the Sheffield Model Engineer Society which, for that event, combines with the Ship Model Society and the Sheffield Society of Aero-modellers. A bigger and greater variety of models than ever is being assembled in the Central Technical School, West St., Sheffield, to be open to the public, April 12th to April 15th inclusive, from 10 a.m. to 10 p.m. Admission is free and there will be an amazing and interesting range of things to see and learn about.

Patterns for MODEL OIL BOWSER

See opposite page



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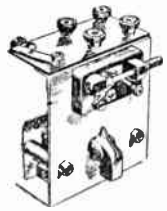

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