HOBBIES WEEKLY

IN THIS ISSUE

AUGUST 15th 1956 VOL. 122 NUMBER 3172

★ FREE Design Inside

THERE must be thousands of homes in which a permanent cover to hold the current issue of the *Radio Times* would be welcome.

This publication receives constant thumbing and reference when seeking the day's programmes. Often, too, it has a habit of getting mislaid just when a quick glance is needed, and there is also a danger of mutilation if it is left lying around with the daily papers which are invariably cleared away by the housewife the next day.

A necessity in almost every home

'RADIO TIMES' COVER

A cover, therefore, is desirable, and the one illustrated is quite easy to make, looks well, and is permanent, being made from thin plywood. When the week's programmes have finished, you just untie a bow, take out the old *Radio Times* and replace it with the new issue.

The cover consists of two sheets of 1/32nd plywood with the words 'Radio Times' and the B.B.C. crest cut out as overlays in the same wood. The two covers are bound together with plastic thonging, which also forms the hinge and binding round the edges.

The covers are shown full size on the design sheet, with the overlays in their correct positions for gluing. The positioning of the holes to take the thonging should also be strictly adhered to. These holes can be made easily with a leather punch, which should be gripped hard and given a twist to the right or left. Alternatively the holes can be made with an ¼in. drill, but this takes a lot longer to do.

The two parts of the cover are of course identical, the overlays being added only to the front.

The construction procedure is to cut

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

For Modellers, Fretworkers and Home Craftsmen

4½D

What's cooking ?

A Frame for Sweet Making

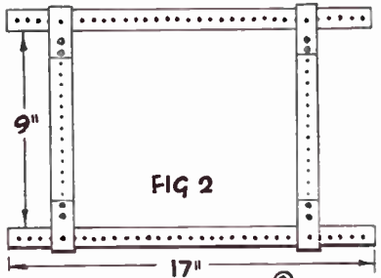
BESIDES being a most fascinating hobby, home sweet making can also be quite a profitable one. In order to obtain the best results, however, certain utensils and gadgets are necessary, and many of these can be easily made by the handyman.

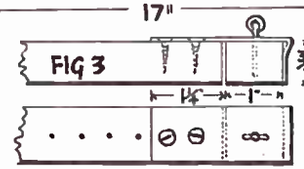
The utility frame for moulding your confectionery and described here is an excellent example, and was designed and used by the writer for many years, and has given excellent results. It enables many kinds of sweets to be turned out quickly and in a most professional manner. Even if you do not actually make the sweets, your mother, sister or wife will, doubtless, be delighted with it.

Consisting of four wooden bars, the frame can be adjusted to form a rectangle of varying size to suit the amount or type of sweet being made (Fig. 1). Most kinds of toffee, caramels, nougat and fudge can be made up and poured into the frame to the correct depth and allowed to set. While in the frame all these may be lightly marked ready for cutting up to the proper size.

Being a clean light wood, sycamore is probably the best to use for making the frame, although you may use almost any good quality hardwood for the purpose. When fully extended the inside measures 15in. by 9in., which can be easily divided up either way into equal sections ½in., ¾in. or 1in. apart, depending on the kind of sweet being made. Other sizes can be adopted if desired, but those quoted will be found to fill most needs.

All the bars of the frame are made of wood 1in. wide and ¾in. deep, and the two sides are 17ins. long, while the shorter spacing bars are 9ins. long. Make sure that they are planed up square and true, so that adjustment will be easy.





Draw a line down the centre of each long bar, divide this into equal parts of ½in., and then drill through with an ½in. bit along the entire length. The short bars are likewise marked off into ½in. spaces but not drilled. In order to make the marks permanent, however, they may be countersunk lightly.

The entire frame is held together and the adjustments made possible by the spring clips fixed on each end of the short bars. Cut four pieces of stiffish sheet brass 3in. long, 1in. wide, as shown in Fig. 3, which gives the positions for the three holes. Two of these are for fixing the clip to the end of the bar and these are best countersunk so that the screws will be flush with the bar. The other hole is ¼in. diameter to take the adjustment and fixing pin.

Now bend the end of the strip at right angles as shown. Note the slight projection before the actual right angle bend is made, which is to give sufficient springiness to hold the bar just friction tight.

The woodwork should be glasspapered quite smooth and left in its natural state, and during its use will be constantly washed and thoroughly dried afterwards. For toffee and caramel making the frame should be well oiled with an edible oil such as olive before pouring out the mixture, while fudge and certain other confections need wax paper to line the frame.

When in use the frame is stood on a cold level surface such as a steel or tin plate sheet, or on a marble slab. An old washstand top makes an excellent surface and enables the goods to cool quickly, which is essential for success.

Other size frames may be made if it suits your purpose better, but it is advisable not to exceed the measurements too much, otherwise it will become more difficult to control. You could, however, have one or more additional sets of the short bars, say, one of 6ins. and another of 12ins., so that the width may be varied.

(A.F.T.)

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'Radio Times' Cover

out the two covers and overlays, punch the holes and clean up with glasspaper. Then give the covers a dark stain and glue on the overlays which should be left light for contrast. Finally give a coat or two of clear lacquer.

The thonging can next be proceeded with, and the diagrams on the design sheet show the methods used. The two covers are treated separately. Start off by tying the thonging loosely in the top left-hand corner of a cover as shown in Fig. 1. Continue down the left-hand side with blanket stitch. When reaching the bottom corner of this first side, change over to plain thonging as shown in Fig. 2 and continue with this right round the three remaining sides until the starting point is reached again. There tie off with the end which was loosely tied at the start.

Repeat the same procedure for the second cover. A total of 5ft. 6ins. of thonging is needed for each cover.

To hinge the two together, lay the front cover on top of the back and using 4ft. of thonging tie the two covers together at the bottom left-hand corner, picking up the two bottom blanket stitches. Tie off, leaving an end (A) hanging, about 6ins. long (Fig. 3). Then going up the 'spine' lace the blanket stitches together, passing the thonging round and round neatly about three times to each blanket stitch. At the top, knot off the last blanket stitch, leaving the remainder of the thonging to hang down as at (B) in Fig. 4.

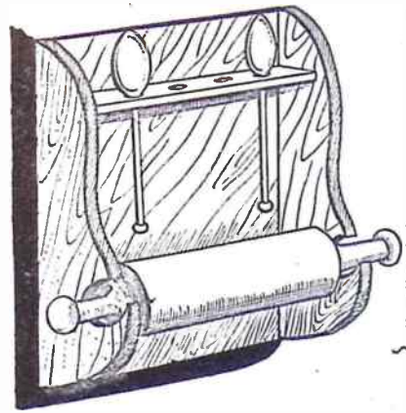
The *Radio Times* can now be placed in position, and the two ends of the thonging tied off in a bow to hold it securely.

KIT ONLY 4/9

A kit for making this 'Radio Times' Cover costs only 4/9, complete with plywood and thonging and obtainable from branches etc, or Hobbies Ltd, Dereham, Norfolk (post free). Suitable punch pliers are also obtainable, price 3/11.

On the Kitchen Front

BRACKET FOR ROLLING PIN



By J. MacIntyre

ROLLING-PINS are rather unwieldy things to have lying around the kitchen and this particular wall bracket was designed with this fact in mind. If the reader so desires he can enlarge on the original design and include tins of cooking ingredients. Instead of a compartment for spoons for instance, the top half could be constructed in such a way as to support the tins.

The actual making up of the bracket is very simple as can be seen from Figs. 1 and 2. End pieces are drawn out from the scaled diagram and it is simple to transfer these to the wood. Since rolling-pins sometimes vary in length it is advisable to measure and construct the bracket to fit your own. Approximate measurements have been given in Fig. 2 and this should fit most rolling-pins, but it is better to check.

The final finish for the bracket will depend on personal preference. Varnished wood looks very well in its natural state, or it may be painted to match an existing colour scheme in the kitchen.

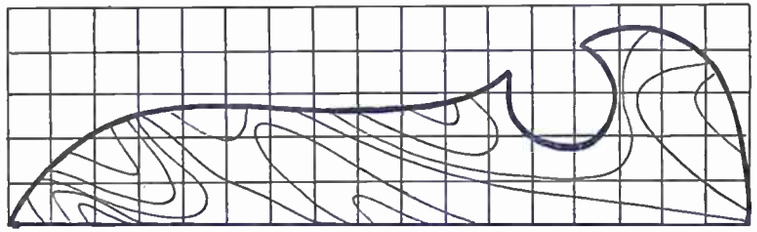


Fig. 1

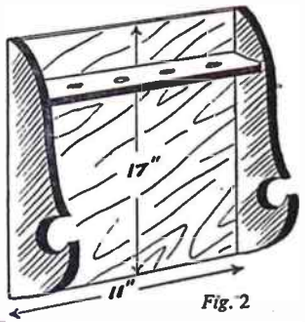


Fig. 2

Making Flowers from Papier Mâché

ARTIFICIAL flowers can be made from various materials, but the material which responds so well to modelling and drawing, and which retains the modelling, is papier mâché

Before beginning to make flowers in this medium, however, the papier mâché itself must be made. Here is a simple way in which this can be done, and the following are all the items that will be required:—

A piece of fairly fine white cotton material about 30ins. by 20ins.

Two sheets of tissue paper.

Half a pint of flour and water paste (made from two tablespoonsful of flour and half a pint of cold water mixed together and boiled for a couple of seconds).

An enamel table or a sheet of plate glass if possible, on which to work.

Eliminate the lumps

When the paste has cooled, lay the cotton material flat on the table and place two or three spoonsful of paste on the material, rubbing it smoothly all over and into the cotton so that no lumps appear. This is best done with the flat palm of the hand.

Now, place one of the sheets of tissue paper over it and lightly press with a clean cloth.

The material should then be reversed, so that the pasted material is at the top and the tissue paper underneath. (The table should, of course, be cleaned before re-laying the material on it.) The other side can now be given the same treatment, first with the paste and then with tissue paper.

The papier mâché is now ready for drying, which should be done preferably in the air. As soon as it has thoroughly dried, roll the sheet up if you are not ready to make the flowers.

To make the flowers, cut out the flowers, petals, stamens and leaves from whatever patterns have been used (preferably from real flowers), wire the leaves and model the parts with a hot iron. They can then be given two coats of paint in their appropriate colours. The middle tone should be painted first, so that when the paint has dried, the lighter and darker tones can be painted on and any special veining or marking on the leaves painted when the second coat has dried.

As soon as the centres have been made, painted and dried, the flowers and leaves can be mounted on the stalks.

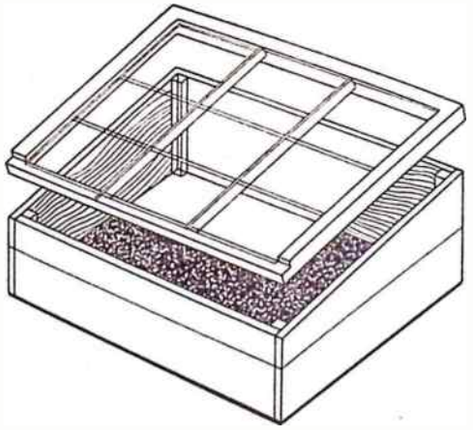
Making the stalk

To make the stalk, take a small piece of cotton wool, pull it out until it has thinned, and cover the wire stalk, rolling it around between the thumb and forefinger until all the wire is quite covered.

The paper covering can now be added, using ½in. wide strips, but to ensure the covering keeping 'on the cross' cut the starting end at an acute cross angle. Where a leaf comes part way down the stalk, discontinue the stalking, wire the leaf on and cover with cotton wool, and then resume covering the complete stalk.

Finish off by painting the stalks and adding a little white picture varnish when the paint has dried. (E.M.B.)

COLD FRAME FOR THE GARDENER



Described By A. Fraser

GROWING things under glass is an exciting experience and advantageous as far as cutting the cost of living is concerned. Although the possession of a proper greenhouse may be precluded on financial grounds, or lack of space, the use of cold frames enables us to have that experience, slender though our resources may be.

The cold frame is a boon to any gardener, even more so to those with only a backyard. For the small amount of labour and expense involved in making one, it pays for itself many times over.

Some may wish to raise and grow special flower plants they particularly like, but others will need the cold frame for fruit production. Tomatoes, cucumbers and melons are easily grown in frames. With tomatoes, the frame can be made deeper to give space for the fruit trusses to hang down clear of the ground.

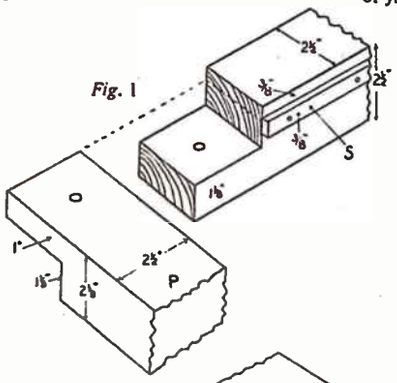


Fig. 1

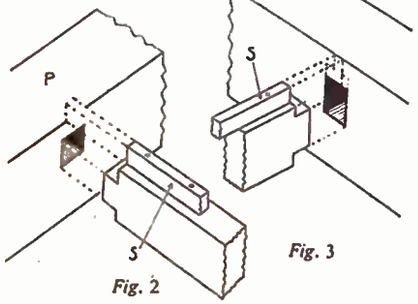


Fig. 2

Fig. 3

Invaluable Protection

A frame is also invaluable for giving winter protection to autumn sown sweet peas and half-hardy perennials, and also to lettuces, preparatory to planting out the following spring.

Frames can be built with walls of brick or concrete, or asbestos cement sheeting. But wood is found to be more satisfactory in every respect for most people. It has the additional attraction of being portable, so that it can be moved to different points in the garden or yard.

The thicker the wood the better, as it gives strength and helps, moreover, to retain the heat in the frame. However, good results are obtainable even from thin wood. If possible, wood 1in. or more in thickness is ideal.

The sizes of standard frames are 4ft. by 4ft. or 4ft. by 6ft., but one should choose a size to suit one's own convenience. Whatever the size, however, it is necessary that the frame 'light' (or glass top) should be on a slope, so that the rain can run off. For this reason, make the back wall of the frame 6ins. or so higher than the front wall. Useful dimensions are 1ft. for the front wall and 1½ft. for the back. For special crops (as for tomatoes already mentioned) the height can be increased, say, to 2ft. or even more.

Tongued and grooved boarding should be used, as this keeps out the draughts which can be fatal to some plants.

The frame which holds the glass should be quite strong and rigid, otherwise it is likely to bend when lifted and result in the glass cracking. A heavier 'light', moreover, will not be so easily blown back by gusts of wind, as often happens with a light frame.

2ins. by 2ins. timber is recommended, while the glazing bars from back to front (which hold the glass), can be ⅜in. by 1⅛ins. in section. Glazing bars can be bought ready made, but it is quite simple to make one's own substitutes from ordinary rectangular sectioned spars.

Rebates can be made in the outside framing of the light, and in the ordinary spars used for glazing bars, but an easier way is to nail ⅜in. by ¼in. stripwood (or laths) along the inside of the woods, ¾in. down from the top. (See [S] Fig. 1.) These strips go round the sides and back of he frame, but not the front, as the glass here rests on top of the front spar.

Stripwood glazing bars

In the case of the glazing bars, the stripwood is nailed down the centre of the top of the spar, using thin pins. (In the writer's case, old laths were sawn down into strips for this purpose and were quite satisfactory.) In Figs. 2 and 3, bars and strips are shown cut away to show the method.

The bars are tenoned simply by cutting out shoulders in the ends, which fit into mortices made in the outside frame.

Note that the front spar of the frame (P, Fig. 1 and P, Fig. 2) is narrower in depth than the side and back spars — 2⅛ins. to be precise, compared with 2½ins. of the others. This is to enable the glass sheets to rest on the front spar top. This means that the mortices in the front spar (Fig. 2) come closer to the top than in the case of the back spar (Fig. 3). It will be noted that in the first case, the bottom of the stripwood (S) comes flush with the top of the spar, while in the case of the back frame (Fig. 3), the top surface of the stripwood (S) is flush with the back spar top surface. It is important to get the mortices correctly placed to achieve this.

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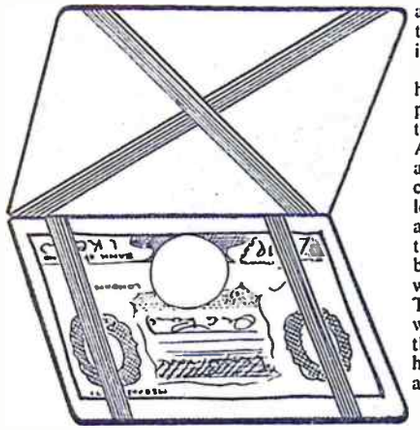
Make it from cardboard

A CASE FOR BANK-NOTES



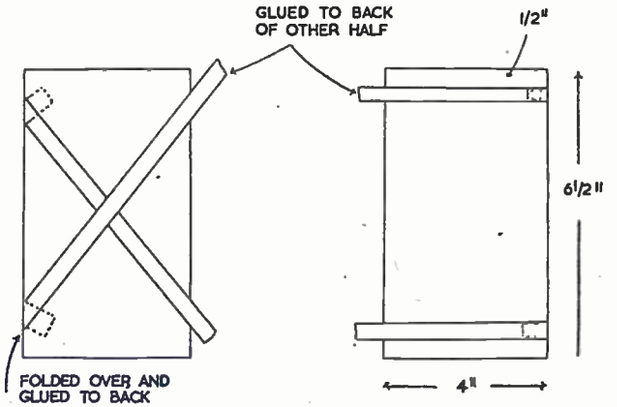
YOU can easily make a useful notecase from cardboard, tape and imitation leather paper. The notes are held quite firmly inside by the tapes yet are easy to remove when required.

Take two pieces of cardboard 6½ins. by 4ins., rounding off the corners a little, so that the case does not catch or tear the pocket linings. A lining paper may be glued to one side of these cards for the inside faces of the case, using any fancy paper you may have available. When this is dry, attach the tapes which act as both noteholders and hinges. From the sketch will be seen that on one side the tapes are crossed, but on the other the tapes run across parallel. In operation the notes are placed in the open case, the leaves brought together and then opened at the other edge. This turns over the tapes and locks the notes in the case.

Reference to the diagram will show how the tapes are attached to the two pieces of card. First of all, the side with the crossed tapes should be prepared. Allow about 1½ins. of tape at each end, attaching one end to the back of the case, bringing over the inside and leaving loose. When fixing these they should be about ¼in. below the inside top. Next fix the crossed tapes, but before fixing, bring the two sides together, marking where the tapes already fixed will hinge. The tapes are then glued over the back, with the same overlap as before, leaving the inside ends free. To complete the hinging, the tapes remaining free are attached to the back of the opposing side of the case. When doing this, see that the tapes are as equal in tension as possible and reasonably taut, or the hinging will be slack.

To finish off the case all that is required is some backing paper to cover up the tapes and rough edges of the lining paper. There are plenty of imitation leather papers at arts and crafts stores in many colours. One sheet will cover many such cases. Cut out a piece exactly the shape of the case for each side. If the paper is folded in two you will be able to cut both pieces at the same time, then glue to the outsides.

Care should be taken to see that no glue reaches the tapes on the inside of the case, or it will not function, the tapes are only attached on the outsides.



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Gardener's Cold Frame

The frame of the light can be established with simple halved joints screwed together (see Fig. 1). Notice the special measurements for the front corners as shown in Fig. 1, which leaves the top of the front spar ⅜in. below the top of the side spars, to allow the glass to slide forward on to the front spar. The far corners at the back are, of course, true halved joints.

If 2½ins. by 2½ins. sparring is used for the frame, then the outside dimensions will be 51½ins. by 39½ins. Inside measurement will be 46½ins. by 34½ins., so if you use different sectioned spar, then start from these inside measurements.

18ins. by 12ins. glass is used and nine sheets will be needed. The overlap will be ½in. each time. Fix the glazing bars correctly to give 18ins. space for the glass, and do not fix permanently until the sheets (all of them) have been tried in position experimentally, to see if all fit in.

Adding the glass

Finally, complete the light by bedding in the glass on dottles of putty, using fine nails to tack them in. Start with the front row of glass first and work back. When all glasses are in, complete the puttying to make the light quite watertight.

No problems present themselves with the making of the base of the frame on which the light stands. Thick boards should be used and sawn to make the form shown in the illustration. Don't forget the back must be 6ins. or so higher than the front. Corner posts are used to join the four sides together.

The actual construction of the whole frame is completed by attaching the light to the base back by means of three or four stout hinges.

After that, the frame can be thoroughly painted with three or more coats of weather resisting paint. The inside should be painted white — to reflect as much light as possible for the plants.

If the frame is located in a garden, a foundation should be made for it of bricks placed end to end, on which the frame rests. Never place the cold frame permanently on soil which will get wet, for the wood will eventually rot.

With any camera

MAKE SOME 3-D SNAPS

THERE is nothing new in the idea, but it seems from time to time to slip into the limbo of forgotten things that it is possible to make excellent stereoscopic pictures with an ordinary single-lens camera.

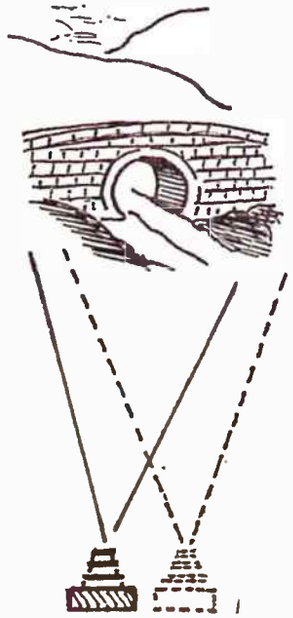
There is one limiting condition, however; the subject taken must be absolutely still. Otherwise as far as results are concerned there is nothing to choose between a stereoscopic slide made with a single-lensed camera as described here and one turned out by an official stereoscopic instrument.

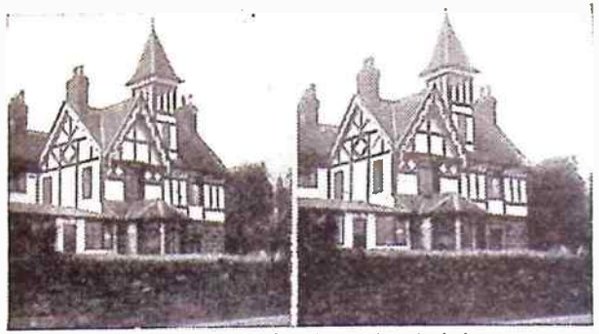
3-D pictures have, of course, all the depth and roundness of nature and are made by taking two pictures of the subject at a little distance (sideways) apart.

By H. A. Robinson

These correspond to what the separate eyes would see and when they are viewed in a stereoscope the optics are forced to go through the same evolutions that they would in nature. Thus the same impulses are sent to the brain and the twin pictures merge into one solid-looking rendering.

The average distance between a pair





Subjects like this can readily be taken with a single lens camera

of eyes is 2¼ins. to 2½ins. and stereoscopic cameras which have two lenses and shutters, being in effect two cameras set side by side, have the optics round about this distance apart. In the single-lens method we get the twin pictures and necessary displacement by making one exposure then moving sideways a little and making another.

Although 2¼ins. to 2½ins. is the correct eye width, a little wider base, as it is called, is often good for it gives depth to items further away, items which, with the ordinary separation, would appear to be on a flat frieze.

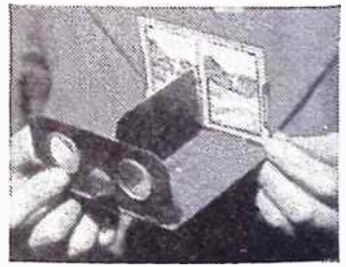
With the two shutters of a stereo-camera working simultaneously, movement in the subject does not matter and things like street scenes with people and traffic passing to and fro can quite well be taken. Indeed, high-speed work is possible, and the writer has at times got some very excellent sports and other action stereo-pairs with a twin-lensed instrument fitted with a focal-plane shutter. With the two-exposure method, however, in which one is made a space of time after the other, movement of any kind is taboo.

This still leaves a wide choice of subject such as buildings, statues, interiors, distant hill scenes and the like.

The two exposures

To make a stereo-pair with your one lens camera first stop down well to get a big depth from the nearest item to the furthest in focus. Sight, and take snap number one, at some height which can be easily repeated. With an eye-level direct finder the level is repeated automatically in subsequent exposures, but if taking at waist level, some care to note the exact height is necessary. It helps in this question of horizontal height if the camera can be placed on the top of a gate or wall for the two pictures.

Having made exposure No. 1, do not move your feet, but wind the film on (or change the plate), then move about 1ft. to one side for average views and make the second exposure (see diagram). For close-in subjects (under 10ft.) the eye separation of 2¼ins. must be fairly well adhered to, or there will be a sense of exaggerated relief in the final result. A



A simple inexpensive folding viewer

rough guide for the distance the pictures can be taken apart is 1/50 the range, that is the distance from the camera to the subject.

Plenty of detail required

Stereoscopic pictures must be full of detail, having 'something everywhere' and be as grainless as possible. They can be softer than is usually thought necessary, as the brilliance returns in the merged picture. This characteristic can be used in getting all-over detail, as printing can be on soft grade paper which, of course, tends to yield maximum detail.

It helps in addition to use developers of the Ergol, Capitol and Microphen class which give detail everywhere without clogging the highlights. These developers also counteract the danger of under-exposure through using the small

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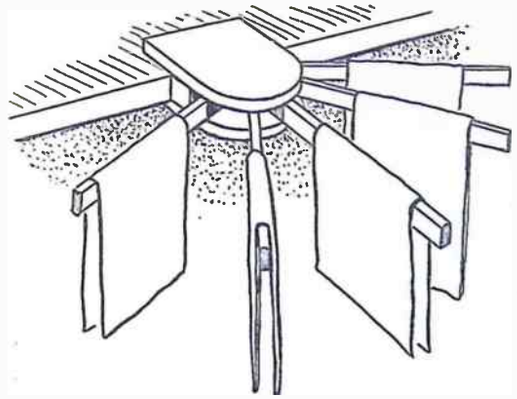
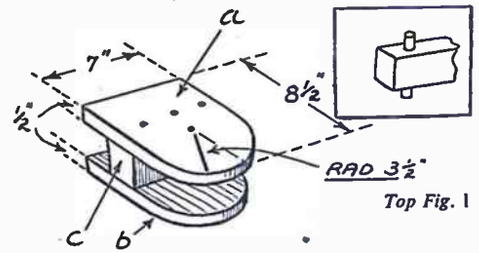


Handyman's project

Airer to Fit on Mantelpiece

By H.A.R.

THE usual type of clothes-horse placed before a fire takes up a lot of space, but while the 'mantelpiece' airer described here also requires room, it does not take up the whole hearth rug to such an extent. In addition it brings the items being dried nearer the heat and also stores away very readily.



Top Fig. 1

Right Fig. 2

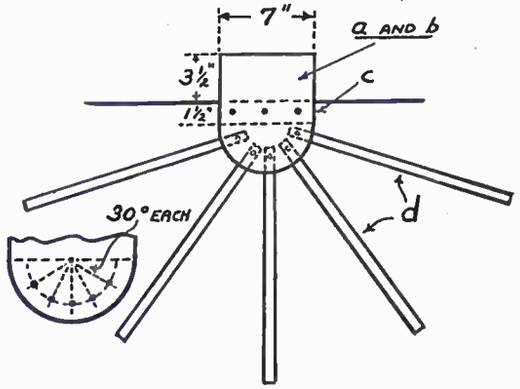
Two pieces of wood are shaped as shown in Fig. 1, from rectangles 7ins. by 8½ins. and ¼in. thick. Care must be taken to see that the wood is fairly tough and that the grain runs lengthwise.

Now prepare the block (c) which is as deep as your particular mantelpiece—normally about 1¼ins. to 1½ins. — and 7ins. long. This is put in position between (a) and (b) 3½ins. from the ends and secured by three screws either side — drilling a little first to prevent all possibility of splitting. It is essential that (a) and (b) are perfectly parallel after the screwing and that the whole arrangement is rigid and generally sturdy.

Make sure at this juncture that the airer will slip easily on and off the mantelpiece. If it is too loose, take apart and plane down the block until a good fit is obtained. If, on the other hand, the block has been cut a little too narrow, put a layer of card along one surface.

Each arm (Fig. 2) is 1ft. 6ins. long, ¾in. wide and as deep as the block. These are held to (a) and (b) by short lengths of dowel fitting in drilled holes. A hole is made ½in. in from the end of each arm of ¼in. diameter. Into these go short pieces of ¼in. dowellings of such a length that ⅜in. protrudes above and below (inset, Fig. 1). Glue the pieces in position.

Five points, ½in. in from the circular edge, are now marked on the top and bottom. They come on lines 30 degrees apart as shown in Fig. 2. At each of these points drill a hole ¼in. in diameter and ⅜in. deep. The dowels must turn readily in these holes, a little graphite being rubbed on if necessary. Put in the arms and assemble.



●Continued from page 310

Make Some 3-D Snaps

stop. The only time they should not be used is if you are working in brilliant summer light by the coast when your normal method of developing will give all that is wanted.

The prints made, they are reversed in respect to the taking sequence and mounted on a card for viewing in a stereoscope. You must have one of these, for although it is possible to get the knack of getting the stereo effect from the prints by the naked eye alone, the viewer is necessary to give an enlarged result. Small viewers can be bought very cheaply.

To mount, cut a card of a size to fit the viewer and trim the prints till the areas included agree. Then by trial and error find which is the left print and which the right by looking through the viewer and holding the prints against the card. If the wrong way round, holes will look like pimples and elevations like holes.

Paste down one print with a good mountant, then, again looking in the viewer, move the other print about till perfect merging takes place. Still holding, mark the corner positions and then mount to these guides. Put now under pressure till everything is dry and your stereoscopic slide (or stereogram) is complete.

Attention pays dividends

HOW TO CHARGE BATTERIES

IN order that the battery charger described last week may be used to best advantage, details of the correct method of undertaking this work will be dealt with here. The same considerations also apply to a ready-made or existing charger, and to the care of accumulators generally. For example, regular attention to the accumulator fitted in a motorcycle or vehicle can go a long way towards securing a satisfactory life from it.

Three main types of cell exist — the free acid cell, jelly cell, and 'dry' accumulator where the acid is held in some kind of inert packing material between the plates. Jelly and dry cells cannot be spilled, so are particularly suitable for portable radio sets, models, etc. Accumulators of all three kinds require much the same treatment.

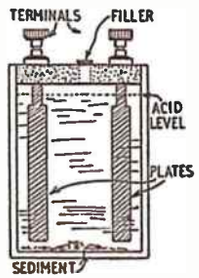


Fig. 1—Free acid accumulator

A typical free acid cell is shown in Fig. 1. This would give 2 volts. A 6 V battery would be made up of three cells in series. If the battery is required to give heavy currents, it will have several plates each side, but will still be only 2 V per cell.

For Long Life

An accumulator can give regular service over quite a number of years, if maintained in good condition. To accomplish this, the acid level should never fall so low that the plates are exposed. To compensate for evaporation, distilled water is added, and can be purchased very cheaply from a chemist. Tap or rain water should not be used. Nor should acid be added unless some has actually been lost by spilling. Exposed areas of plates cease to function — a battery only three-quarters full would have lost one-quarter of its power or capacity.

Another cause of rapid deterioration is taking too heavy a current, especially if caused by short-circuits in wiring, etc. In addition to discharging the battery, it will be to some extent permanently damaged. Careless charging at a rate higher than that indicated on the battery also damages it.

Leaving a battery discharged also causes trouble, due to sulphate forming on the plates. If a battery has been left in this way, it is best given a long charge at a very low current — say, one-quarter of that usual, to dissolve the sulphate.

All such misuse flakes away the red-lead of the plates, which collects as sediment in the bottom. Eventually, so much may gather that it short-circuits the plates internally. If the plates are fairly sound, the cure is to charge the cell fully, pour out the acid, wash out with distilled water, and fill with new acid.

The top of an accumulator should be kept clean and dry, to avoid leakage and corrosion. The latter especially arises at the terminals, and can be prevented by cleaning them and smearing with vaseline or petroleum jelly.

With dry and jellified accumulators, distilled water is added at the filler before charging, and any surplus poured off again when charging is completed.

Cell Testing

Taking a reading with a voltmeter does not really show the condition of an accumulator, and this method is not used. Instead, the specific gravity of the electrolyte (or liquid filling the cell) is measured with a hydrometer, a typical one, with enlarged illustration of the float, being shown in Fig. 2.

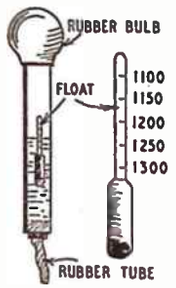


Fig. 2—Hydrometer for S.G. readings

To test a cell, the filler plug is removed, the hydrometer tube inserted, and acid drawn up so that the float rises freely. The latter is usually a glass tube, weighted at the bottom. When the acid is weak, the float sinks low, giving readings around 1,100 SG. As charging continues, the acid becomes more dense, or of higher SG., giving readings around 1,300. Readings vary a trifle according to temperature, but the following are average for normal temperatures:—

1,125 SG. or lower: Fully Discharged.
1,200 SG.: Half Charged.
1,275 to 1,300 SG.: Fully Charged.

The readings are actually 1·100, 1·150, and so on, clear water being taken as 1, but the floats are usually marked as in Fig. 2. Clear water would be 1,000 on this scale.

By F. G. Rayer

Specific gravity tests cannot be made with dry or jelly cells. These can be charged in accordance with the Ampere-Hour rating, or a voltmeter brought into use, charging continuing until the voltage ceases to rise.

Ampere-Hours

This, the AH or Capacity rating, is easily understood. For example, a 20 AH accumulator, properly charged, could theoretically deliver a current of 1 amp. for 20 hours. With lower discharge currents, increased capacity is obtained. For example, if only ½ amp. were drawn, in actual fact rather more than 40 hours (½×40=20 Ampere-Hours) use would be obtained.

The AH charging rate is normally marked on dry accumulators. A typical example is: '25 hours at 1 amp., normal rate. 17 hours at 1½ amps. maximum. Or equivalent at lower rates'. This means that the battery *could* be charged at 1½ A for 17 hours. But 25 hours at 1 A would be better. The equivalent at lower rates is equally good, such as 50 hours at ½ amp.

In actual fact few charging stations are very careful about the rate or time, and proper home charging will usually be superior, both in increasing the life of the battery, and the period of use obtained with each charging.

Charging Several Batteries

More than one battery can be charged at a time, up to the maximum output of the charger. The actual voltage and current can often be arranged to suit the charger, as Fig. 3 illustrates. Here, identical accumulators each requiring 1 amp. are shown. Wired in parallel, charging is as for a 2 V 3 amp. accumulator, but if wired in series, charging is the same as with a 6 V accumulator at 1 amp.

When batteries are wired in parallel, they must all be of the same voltage, but if in series, this is not necessary. For example, a 6 V battery, 4 V battery, and

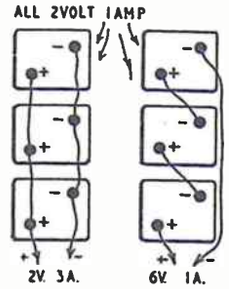


Fig. 3—Methods of connecting for charging

2 V battery, all in series, could be wired to a charger intended for 12 V.

If some of the batteries have a lower AH rating, it will be necessary to remove them first, after the appropriate period, or when the SG. reading is satisfactory.

When a 2 V cell is fully charged it will usually be about 2·8 V, which means that a 6 V battery would be 8·4 V and so on. With home charging it is not very important to charge fully, as the battery can easily be put on charge again when necessary. There is no need, whatever, to maintain the charging rate at any definite figure, and the ammeter pointer will slowly fall back, as the voltage of the battery rises during charging. Some overcharging, especially at the low rates obtained from a small charger, will not damage the battery.

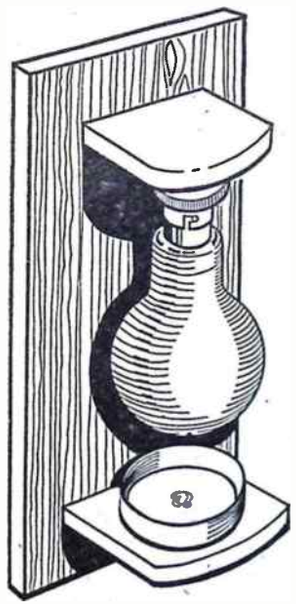
Jelly Acid

It is quite feasible to jellify the acid in a free acid cell, to guard against spilling. To do this, the cell should first be charged up fully, using ordinary acid. The acid is then poured out and the accumulator placed upside-down to drain for about 30 minutes. A new electrolyte is then made up by mixing 1 part of pure sodium silicate, 1,200 S.G. with 3 parts of sulphuric acid, the latter being 1,400 S.G. The accumulator is then placed somewhere from which it need not be moved, and the electrolyte poured in at once. The battery must then be left untouched and not disturbed for at least 15 minutes, by which time the electrolyte should be set.

If the free acid originally removed is poured into a jam jar or vessel which can be used as a measure, this will act as a guide to the amount of jelly electrolyte to mix. After mixing, no delay must exist before pouring into the accumulator, filling each cell up to the Acid Level mark on the glass or celluloid container. During charging, a small quantity of distilled water is poured on top of the jelly.

Costs nothing to make

Lamp Bulb Barometer



HAVE you ever held a burned-out electric light bulb in your hand and asked, 'Wonder what useful thing I could make with this', then sighed and dropped the lamp in the dust bin?

The next time a bulb dies on you, why not use it to shed a little light on the weather, by making this novel and accurate barometer?

Remove glaze

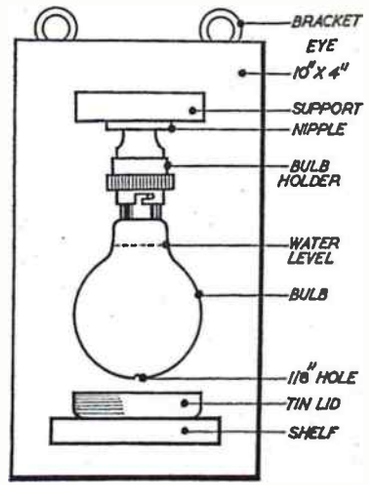
Any old bulb will do; it need be no particular shape, size or colour. First step is to rub the large glass end, directly opposite the cap, over a stone. Keep rubbing until the glaze has been removed over an area of about ¼in. in diameter. Removing the glaze will help you to do the next operation, which is to drill a hole about ¼in. in diameter through the glass.

By Eric Milne

This can be done by several methods. One of the simplest is to get hold of a small file, with a sharp point at the business end. Place the point in the middle of the unglazed portion and twist, using light pressure. Go carefully, and in a few minutes you will have a hole the required size.

The bulb should now be almost filled with water. This should be simple enough if the hole has been drilled to the given diameter, and placed under a long narrow stream of water from the tap. Fill almost to the top, then dry off and hang up.

A piece of string tied around the cap and hung above the kitchen sink will suffice, but if you want to make it into an attractive fitting for the hall, then place the bulb in a dummy bayonet holder screwed to a wooden bracket as shown. A small removable tin will be necessary to catch the water when it drips.



Given normal weather, the bulb should contain enough water to last for several months.

Dry bulb — dry day

You will find that it forecasts rain with surprising accuracy. If a small drop of water forms outside the hole but still clings to the bulb, rain is on its way, but is some distance off. When the drop of water lengthens and falls, the rain is just around the corner.

A dry bulb promises a dry day.

Home Chemistry

Experiments With Quinine

WHEN the Spanish conquerors penetrated into South America they found a more valuable article than Inca gold. This was the bark of several species of a handsome tree which grew high up in the mountains of Peru. The Jesuits who accompanied the conquerors came to know that the bark would cure fevers. The bark first came into real prominence when a famous Spanish lady in Peru was cured of malaria by its use.

When chemists got to work on it, they found that the medically active principle contained in the bark was a white substance to which they gave the name quinine. It was found to be a base and consequently formed salts with acids. Some of its salts are now used instead of the bark.

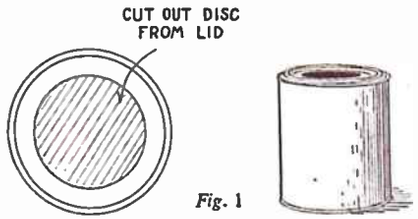


Fig. 1

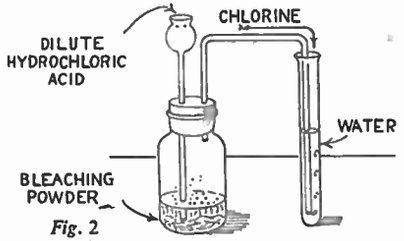


Fig. 2

Quinine sulphate is the most convenient form of the drug for use in our experiments. It is a light white powder and sparingly soluble in water. Take up a little on the point of your penknife blade, drop it into a test tube half full of water, close the tube mouth with your thumb and shake. The powder does not all dissolve. Now add a few drops of dilute sulphuric acid and shake again. The powder goes completely into solution. Quinine acid sulphate has been formed and this is much more soluble than the normal quinine sulphate.

You will be astonished to see that something else has also happened. The solution has acquired a magnificent blue fluorescence. Fill up the test tube with water. The fluorescence is still visible. This fluorescence with sulphuric acid is a delicate test for quinine.

You might like to make a specimen of this interesting salt quinine acid sulphate. Stir 1 gram of quinine sulphate with 11 c.c. of cold water and drop by drop stir in dilute sulphuric acid until the powder dissolves completely. Pour the solution into a small evaporating dish and drive off the water on a water-bath until only a thin syrup remains.

If you have no water-bath, you can make one quickly and easily from a syrup tin. Wash out the tin and cut out a disc from the middle of the lid (Fig. 1). For small dishes use it with the lid, for larger dishes use it without.

Remove the dish from the water-bath and let it cool and stand awhile. The syrup solidifies to a moist white fibreous mass of quinine acid sulphate. Scrape this out and place it on a clean porous tile or brick to drain and dry. This salt of quinine, too, has found considerable use in medicine to reduce the temperature in fevers and as a tonic.

Another striking reaction of quinine is the thalleioquin colour reaction, and which is much used in the analytical detection of quinine. To try it out, pour some freshly made chlorine water into a test tube to the depth of about 1in. Drop in some quinine sulphate whose volume is about that of a peppercorn. Now add one drop of clear household ammonia (ammonium hydroxide). A brilliant green colour will appear. This reaction is so delicate that it will detect one part of quinine in 20,000 parts of water when carefully applied.

You can make some chlorine water for this test by acting on bleaching powder ('chloride of lime') with dilute hydrochloric acid and leading the evolved chlorine gas into water until the latter has a distinct greenish-yellow colour. Use the apparatus shown in Fig. 2 and conduct the operation in the open air, for chlorine is poisonous if breathed in any quantity.

A modification of the thalleioquin test gives a useful confirmatory reaction for the presence of quinine. Mix chlorine water and quinine sulphate as before and then add one or two drops of potassium ferrocyanide solution so as to give the liquid a yellower colour. On adding one drop of household ammonia a fine ruby red colour makes its appearance.

Quinine belongs to a class of carbon compounds containing nitrogen, which are known as alkaloids. As such, quinine gives certain other reactions which are typical of alkaloids. Dissolve a pinch of quinine sulphate in half a test tube of water by adding dilute sulphuric acid drop by drop and shaking. Now add some Dragendorff's reagent. A lovely orange-red precipitate will appear. When you carry out this experiment you are seeing a typical reaction for alkaloids.

Another typical reaction is that with tannic acid. Shake a pinch of tannic acid with half a test tube of water until it has dissolved. Make a solution of quinine sulphate as in the last experiment and add some of the tannic acid solution. An off-white precipitate forms.

A curious compound of quinine sometimes known as Herapathite also serves for its detection. Herapathite is known chemically as quinine iodosulphate. To prepare a specimen, mix 1 gram of quinine sulphate with 10 c.c. of methylated spirit and add enough dilute sulphuric acid to give the liquid an acid reaction — which may be ascertained by testing a drop on blue litmus paper, when it will turn red. Stir in portions of a solution of iodine crystals in methylated spirit as long as a brown precipitate continues to form. The precipitate is Herapathite, but to see it in its characteristic form it must be recrystallised.

Heat up a water-bath, turn out the flame and warm the vessel containing the Herapathite in the water. If the Herapathite does not entirely dissolve when the liquid is boiling, add more meths. until complete solution is effected. Remove the vessel from the water-bath and let it cool and stand some time. Bronzy, scintillating spangles of Herapathite separate as the liquid cools.

Before the liquid cools place a drop on a glass slip. As the drop dries out, the Herapathite takes on a green metallic appearance — but only in reflected light. If you have a small student's microscope, look at the Herapathite with the light passing through it on the slip. The crystals now look red in the transmitted light. A strong hand magnifier will also show the red colour.

After standing some hours the Herapathite can be filtered off, washed with cold water and dried at room temperature for your specimen collection. (L.A.F.)

Replies to Readers
Is this YOUR Problem?

Painting Concrete

I UNDERSTAND that egg preservative may be used to prevent a concrete surface from dusting; how is the material prepared? I wish to paint some concrete blocks which form the interior of a garage. How should I treat a ceiling which is to be painted? (S.W.—Westbury-on-Trym).

SILICATE of soda (water glass) is quite good to apply to concrete to prevent dusting. Mix with water as stated on the tin in same proportion as for preserving eggs. For painting on concrete it is best to employ one of the concrete paints available now from oil and colour shops. Size is not particularly suitable to fill up plaster before painting. Use a thin paint as an undercoat and apply two coats, allowing time for the paint to penetrate the surface of the plaster. This will form a satisfactory bond on which the finishing coat will adhere well.

* * *

Renovating a Pram Hood

CAN you recommend a preparation which I could use to restore the maroon colour to the hood and apron of a pram? (D.D.—Haverhill).

AS the hood of the pram is apparently of fabric, some renovation can be gained by washing over with benzine or petrol, but this will not restore the colour if faded through sunlight. The only remedy is re-dyeing. Remove the fabric from the frame, then clean with warm soapy water to remove dirt and grease. Any of the aniline dyes sold for home dyeing can be employed, after which the material should be dried and lightly ironed before refitting to the frame. If difficulty is experienced in obtaining a maroon dye, get the nearest you can to Venetian red or Indian red, and add a few drops of aniline black. Add the black very carefully until the best possible result is obtained, and be sure to make sufficient to do the job at one time.

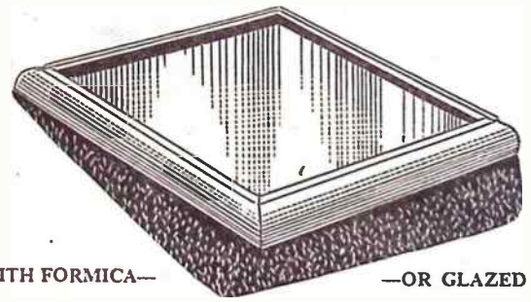
* * *

French Polishing

I HAVE a pine wood dining table I would like to French polish. Please tell me how to set about it. (J.V.—Birmingham).

AFTER glasspapering the pine to velvet finish, fill the grain with a filler, proprietary brand, or whitening, made into a paste with turpentine. For the polish, dissolve six ounces of shellac in one pint methylated spirit. Use bleached shellac if the finish is desired unstained, but if a darker shade would be preferred, substitute orange shellac. The polish should normally be applied with a pad of cotton wool, covered with a white fluffless rag, but if it is to be put on with a brush, add two ounces of resin to the polish.

STANDS FOR TEAPOTS



MADE WITH FORMICA— —OR GLAZED TILES

BY using glazed tiles or Formica, you can make very attractive teapot stands to give away as presents or for use in the home.

The basis of the first design shown on the pattern page is a polished tile. These can be obtained in various colours at the local builder's merchant or ironmonger. The section at (A) shows how the tile is surrounded by Hobbies No. 302 moulding and backed up by two pieces of waste wood. This moulding has ¾in. sides and costs 2/3 for a 3ft. length.

The design at (B) shows the same method, but using Formica or a thin plastic tile. The thickness of the backing will, of course, depend upon that of the tile.

The moulding should be mitred round as shown in the diagrams. To do this use a piece of waste stripwood as shown in the section (C) and diagram (D).

Having glued the stand and backing together, you may glue a piece of green baize on the bottom as shown in (E).

Patterns on page 319

If you wish to enlarge the size of the stand slightly, this can be accomplished by adding a framework of ¼in. wood inside the moulding as shown by the diagram (F) and the section (G).

To finish off, the wooden parts of the stand can be painted to match the colour tile used. (M.p.)

Model Engineer EXHIBITION

Every kind of land, sea and air model, all incredibly detailed and accurate, can be seen at this fascinating Exhibition, as well as many kinds of amateur craftsmanship. Model makers from all over Europe, including the Soviet Union, will be competing for the numerous awards offered by the Organisers and Friends of the Exhibition. The MODEL ENGINEER STUDENTS' CUP attracts many fine exhibits from boys under 18 and you will see some wonderful entries for the DUKE OF EDINBURGH TROPHY, which is open only to winning entries at past exhibitions. Then, of course, there are the Club Stands, the Trade Stands and the Special Attractions.

SPECIAL ATTRACTIONS

Demonstrations by craftsmen of the skills needed in model making. Miniature coal-burning locos on the live steam track. Radio-controlled vessels on the marine tank. Racing car track with miniature petrol-engined racers. Two intricate model railway layouts. Full size model of locomotive cab with the usual controls. Steam-driven fairground roundabout.

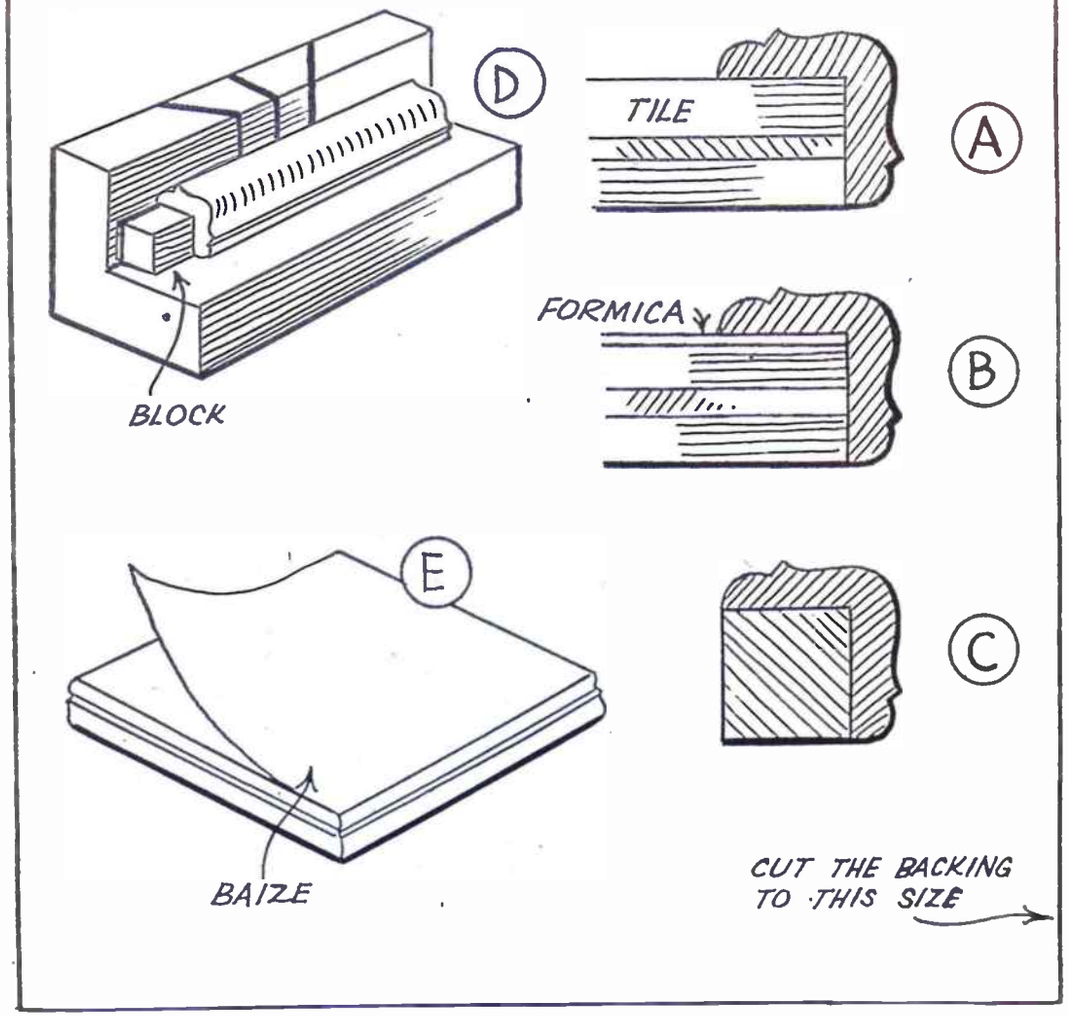
HOW TO GET THERE: *Buses 10, 11, 24, 29, 39, 46, 76, 134 to Army and Navy Stores; 2, 2a, 36, 36a, 57, 69, 169, 181, 185 to Rochester Row; 10, 46 to Horseferry Road. Underground to St James' Park.*

NEW HORTICULTURAL HALL • AUG 22—SEPT 1

WESTMINSTER, S.W.1 • 11 a.m. - 9 p.m. • Admission 3s. (Children 1s. 6d.)

See page 316

Patterns for Teapot Stands



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