

3rd FEBRUARY 1960

VOL. 129

NUMBER 3347

THE ORIGINAL
'DO-IT-YOURSELF'
MAGAZINE

HOBBIES *weekly*

FOR ALL
HOME CRAFTSMEN

INSTRUCTIONS FOR MAKING . . .

Also in this issue:

A JET-DRIVEN
MODEL AIRCRAFT

COLLECTORS' CLUB

 * PATTERN FOR *
 * FRETWORKERS *
 * Page 127 *

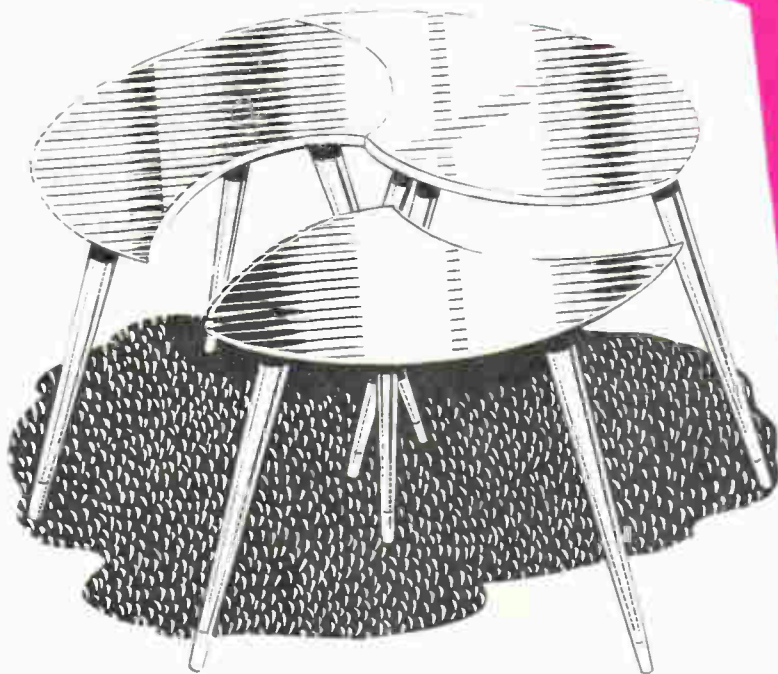
MAKE NOVELTIES
IN SHELLCRAFT

GARDENING HINTS
FOR FEBRUARY

ALL-DRY SHORT-WAVE
I-VALVER

NOVELTY AND
TOY PROJECTS

ETC. ETC.



THREE-IN-ONE TABLES



Up-to-the-minute ideas

Practical designs

Pleasant and profitable things to make

5^D

World Radio History



THE name February is derived from *Februa*, a Roman festival of purification. The occasion was regarded as one for spiritual cleansing.

This is the season for winter sports. Many British enthusiasts travel to Continental skiing centres. In Scotland, curling championships are held. The Waterloo Cup coursing competition is decided.

FEBRUARY

Stamps: Italy 1937, 1 lira — Map of old Roman Empire. Match Labels: Yugoslavia 1958 — Set of twelve winter sports — 3/- mint.

February is also connected with leap year, which occurs every four years, when February has 29 days. But in the last year of a century the leap day is missed unless the date is divisible by 400, which will occur next in the year 2000.

'The Fair Maid', popular name for the snowdrop, blooms at the beginning of February and was probably named in honour of the Virgin Mary. Companion

flower of early spring is the crocus, dedicated to St. Valentine, as it makes its appearance around the 14th of this month. And you may have a picture of the crocus on the Austrian 1948 30 groschen stamp, and Madonna and Child on the 1936 24 groschen.

Abraham Lincoln was born on February 12th, 1809. George Washington, American soldier and President, was born February 22nd, 1732, and Lord Baden-Powell, founder of the Boy Scouts Movement, on February 22nd, 1857. The U.S.A. 1909 2 cent stamp shows Lincoln. You will find George Washington on the U.S.A. 1932 1 cent stamp, and Lord Baden-Powell on Liechtenstein Jamboree set of 1953.

You may know various anecdotes of interest regarding St. Valentine's Day — illustrate them with the neat little picture of Cupid with a letter on the Austrian schilling stamp of 1952.

One need not search for a text for the month: 'I am the Good Shepherd; the good shepherd giveth his life for his sheep'; stamp of Angola 1953, 10 cent blue and salmon — Head of Christ.

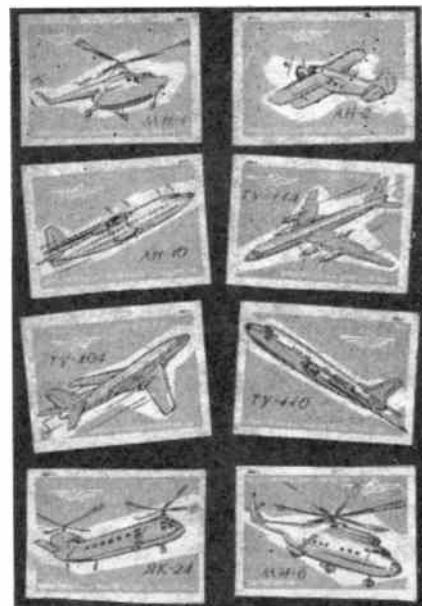
 ★ TIP FOR PHILATELISTS ★
 ★ When Gibbons dropped Egypt ★
 ★ from its Commonwealth catalogue ★
 ★ and inserted it in the 'rest of the ★
 ★ world' section, prices came down ★
 ★ as British Colonial collectors ★
 ★ ceased collecting Egyptian issues ★
 ★ and sold their hol.ings for what ★
 ★ they could get. Egyptian stamps ★
 ★ — no less interesting than a ★
 ★ decade ago—now sell for a frac- ★
 ★ tion of their old price. But these ★
 ★ stamps will increase in value ★
 ★ again and wise collectors (partic- ★
 ★ ularly juniors) should buy now. ★
 ★

AND now in answer to many requests here are some Russian pen friends.
 Leonid J. Rosenberg, of H.23, Corp., 1 Fl, 76, B. Filewskaja, Moscow, G.96, U.S.S.R., collects postcards, stamps, and labels.

RUSSIAN FRIENDS

Constantin I. Gevergeieff, of Bas-manny Tupic 10/12, App. 62, Moscow, B, 64, U.S.S.R., collects match labels.

Yurt B. Tikhonov, of Soviet Army Street 12, Flat 3, The Town of Hinky, Moscow District, U.S.S.R., collects match labels, all kinds of industrial graphic arts, stamps, coins, postcards, magazines, and pictures of Sputniks.



Recent issues
 of Russian
 match labels.

DROODLES CAN BE FUN

DROODLES are puzzle pictures with amusing and weird titles. No great skill is needed in order to draw them, since every picture is virtually reduced to a simple diagram. Indeed, an elaborately drawn doodle will not have the same humorous appeal as one based upon a few quickly executed pencil strokes. During recent years national magazines and newspapers have run doodle competitions, which have always been popular with their readers. The name 'doodle' was invented by the American variety artist, Roger Price, and many of his original drawings have become well known.

Perhaps the easiest doodle of all is the blank sheet of paper, with the title 'A White Cat in a Snowstorm', or, if you prefer — 'Spilt Milk at the South Pole'. A single black dot on the paper becomes 'A Ghost with a Cast in his Eye', and a straight line may represent 'A Used Lollipop' or 'A Naughty French Postcard Seen from the Side'.

Without any artistic talent you can depict a wide range of natural history curiosities. Fig. 1 shows 'A Bear Climbing the Other Side of a Tree'. Fig. 2 illustrates 'Siamese Kittens', and in Fig. 3 you will see 'Bugs Making Love in the Spring'. Fig. 4 is 'A Flea Committing Suicide', and Fig. 5 is, surprisingly, 'A Snake Going Down Stairs Backwards'. Worms make good subjects for doodles, and in Fig. 6 we see 'A Very Forgetful Worm', while 'A Determined Worm Crossing A Razor Blade' is shown in

Fig. 7. Doodles of birds include 'A Pelican Eating a Hot Cross Bun', represented by Fig. 8, and Fig. 9, which is 'A Humming Bird Wearing A Lone Ranger Mask'. Fig. 10 is 'A Seagull Sent to Coventry'.

By now you will understand what a doodle is, and you will be eager to set about inventing new ones for yourself. Creating new doodles is an absorbing pastime, which can be indulged in whenever you have a few moments to spare. It is fun to compile a collection of doodles. Your friends will be sure to want to draw some for you. Thus you will be provided with new drawings for your collection. Each new drawing may be copied into a sketch book which you can keep for the purpose. Number each little picture, and make an index of titles at the end of the book. If you do this, your album will provide a source of much amusement as a book of puzzle pictures, the titles of which must be guessed before being checked against the index.

What are these?

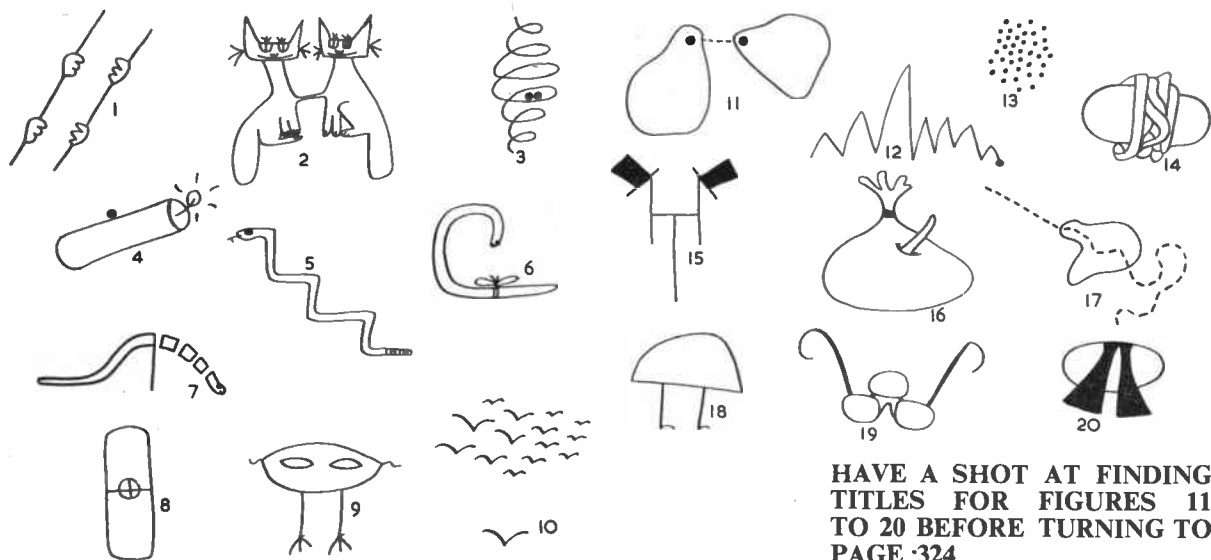
Figures 11 to 20 comprise a small collection of problem doodles which may baffle you. Can you say what they are? The real titles are on Page 324. As a party novelty, make a 'Gallery of Doodles' by drawing about a dozen puzzle pictures upon postcards. Number these, and place them around the room, so that each guest may inspect them and

write down a list of suggested titles.

At a summer garden fête an exhibition of doodles will create interest. 'Hang' about 30 pictures in a roomy tent. The doodles can be drawn with a brush in Indian ink upon large sheets of drawing paper. Number the mystery pictures, and have all the titles set down in a duplicated 'catalogue', for which an admission fee of sixpence is levied.

The rapid sketching of doodles, accompanied by brief and entertaining patter, will provide an unusual type of act at a concert. You will need a blackboard, some chalk, and a good quality blackboard duster. You may care to dress up in the cap and gown of a schoolmaster. Practise your sketches beforehand, until you can make them smoothly and without undue concentration. Every drawing should be as big as possible, and the chalk strokes should be boldly done. Remember that your performance must be seen and understood by the persons furthest away from you. Use yellow and red chalk, as well as white, for a brighter effect.

It may happen that you know most of the individuals in your audience. Capitalize upon this, and introduce personalities into your titles, but never be rude to anybody. Select only those persons who can take a joke. Your act should be neatly and wittily presented with plenty of drawings and with the minimum of words and, on no account, should it go on for more than ten minutes. (A.E.W.)



**HAVE A SHOT AT FINDING
TITLES FOR FIGURES 11
TO 20 BEFORE TURNING TO
PAGE 324**

'THREE-IN-ONE' TABLES

FOR the small family these 'three-in-one' tables (illustrated on the front page) are ideal for tea or supper. They can be used together forming one large table 3 ft. in diameter, or separated as individual tables beside each chair. They are easy to make and are quite within the capabilities of the average handyman. The size could be modified if necessary, but the diameter should not be more than 3 ft. 6 in. or less than 2 ft. 6 in.

The tops are cut from one piece of plywood about $\frac{1}{2}$ in. to $\frac{3}{4}$ in. thick. The shapes may be drawn on to the wood direct or on to brown paper, and pricked through. The plywood should be obtained locally.

Commence by drawing out the main circle with a radius of 18 in. (Fig. 1). This can be done with a pencil, piece of string, and a pin or thin nail. Next

divide the circumference of the circle into three, marking the points B, C, D, and the centre A. Bisect the lines AB, AC and AD, and draw the perpendiculars EF, GH and IJ, using compasses, protractor or set square. At a distance of 9 in. from each of the lines AB, AC and AD insert the point of the 'compasses' and strike off the three arcs AIB, AEC and AHD. These various steps are clearly shown in Fig. 1.

Having marked out the tops, the three shapes are now cut with a fretsaw, either handframe or machine. You must ensure that the sawblade is held upright when cutting. Use a coarse blade, and do not force it along too hard.

Clean up the edges with a glasspaper block, and then chamfer the under edge as indicated in the section in Fig. 1 and in Fig. 2.

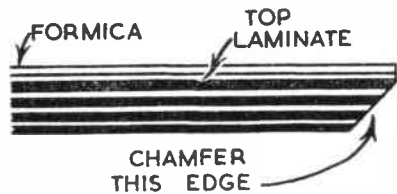


Fig. 2

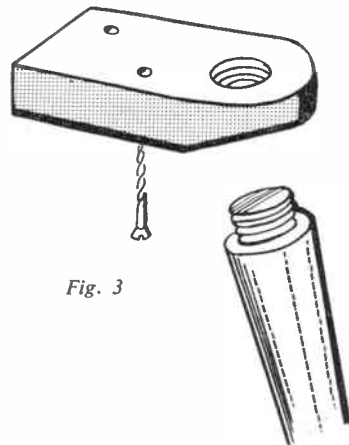


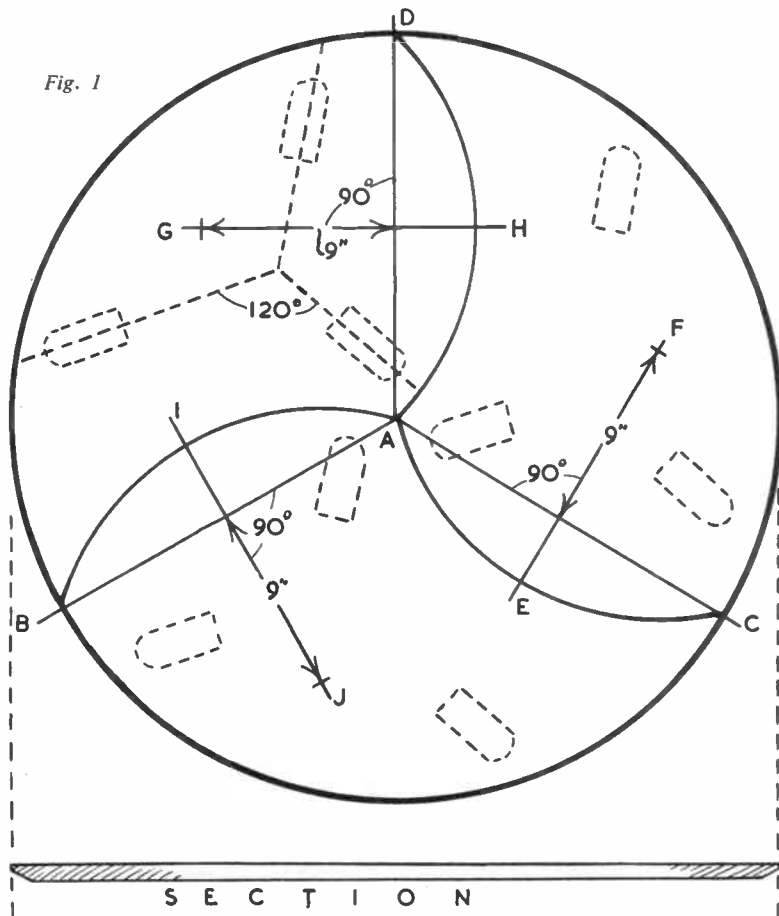
Fig. 3

The legs of the tables are of contemporary design such as are sold by Hobbies Ltd, Dereham, Norfolk. Details of various types and sizes are listed on page 323 of this issue. For this particular purpose there are plain beech 15 in. or 20 in. long, ferruled beech 19 in., or ebonzied beech 18 in. The plain beech will, of course, be cheaper, and can be stained and polished. The approximate positions of the legs are shown on Fig. 1, but it will be appreciated that the centre legs must be positioned by trial and error to prevent them fouling each other when the tables are placed together.

The legs are usually supplied with a similar type of fitting to that shown in Fig. 3. The block is screwed and glued to the underside of the table, and the leg then screwed into the block. It may be necessary to trim the top of the threaded portion of the leg to allow it to be screwed home flush. File off any screws that may be protruding through the top.

Now prepare the tops by glasspapering smooth, and cover with Formica or similar hard wearing plastic

Fig. 1



S E C T I O N

● Continued on page 313

TWO MINUTE QUIZ

by Ed Cappela



A Peer's Hobby

LORD Gretton, genial Director of Bass, Ratcliff & Gretton, Ltd, the Burton-on-Trent brewers, has a deep and abiding interest in railways. His company's private railway has 26 miles of permanent way, its own locomotives, and rolling stock. Lord Gretton has been known to drive the picturesque locomotives. He prefers the 'steamers' — some of which are up to sixty years old — to the modern diesels with their enclosed cabs and car-like driving controls.

At his home, Stapleford Park near Melton Mowbray, Lord Gretton has installed a complete passenger-carrying model railway. Three-quarters of a mile

in length, the railway runs from the house to a lake in the grounds. It has realistic miniature stations at each end, and its own engine sheds. The permanent way is taken through specially excavated cuttings. Scale telegraph posts and wires complete the picture.

Recently an advertisement has appeared alongside the track. It is an exact scale replica of one on the Trent Bridge at Burton announcing that the town is the home of Bass and Worthington, except that it tells passengers that they are 45 miles from the beer town.

The railway carries many hundreds of passengers who visit Stapleford Park each year.

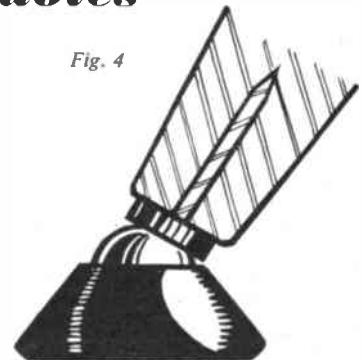
• Continued from page 312


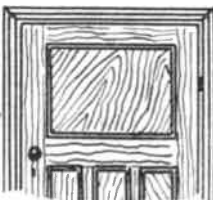


'Three-in-one' Tables

material. Use an impact adhesive, and glasspaper the edges smooth after fixing. The plywood edges should be filled, and painted to match the top. Legs, too, may be painted to match, but being beech, need not be filled. If the tables are to be stained and polished, it is essential to ensure that the fixing screws do not protrude through the tops.

To prevent marking carpets, furniture glides may be fitted to the legs. A glide is depicted in Fig. 4. It is self-levelling and made of black plastic, being 1½ in. in diameter. Glides are obtainable from Hobbies Ltd, Dereham, Norfolk, price 6/9 per set of four, postage 6d. (M.h)

Fig. 4



- 1  WHAT JOINT?
- 2  NAME THE MOULDING AROUND DOOR
- 3  NAME SUPPORTING BEAM
- 4 WHAT IS A BURR WALL?
- 5  GIVE ANOTHER NAME FOR WEATHER-BOARDS.

ANSWERS ON PAGE 322

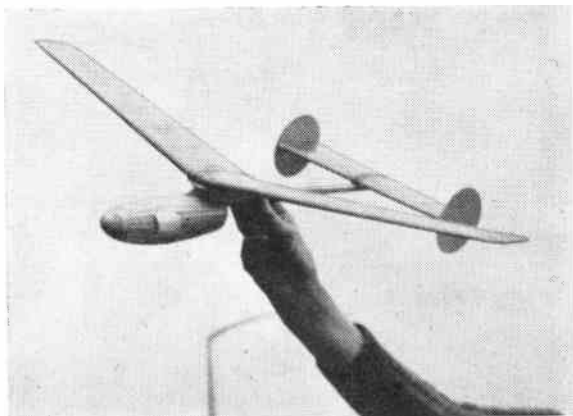
A JET-DRIVEN 'HOBBY SPRITE'

YOU WILL NEED

- 1 piece 1/16 in. sheet balsa 36 in. by 3 in.
- 8 pieces 1/16 in. square balsa 36 in. long.
- 1 piece 3/8 in. square balsa 36 in. long.
- 1 piece 3/16 in. square balsa 12 in. long.
- 1 piece 1/2 in. trailing edge 36 in. long.
- 1 sheet tissue.
- 1 Jetex Paa Master.

Miscellaneous; Small sheet 1/8 in. balsa, small piece 3/32 in. balsa, thin plywood, cement, banana oil, tissue paste.

By
**Gordon
Allen**



THE 'Hobby Sprite' has been specially designed around the new Jetex 'Paa Master' solid fuel jet motor, and the model introduces the hobbyist not only to this fascinating branch of aeromodelling, but to the principles of fuselage streamlining.

Compared with the 'Soarer' and the 'Clipper', two models already featured in this series, the 'Sprite' follows similar methods of construction, with the exception of the former-and-stringer 'pod', which houses the motor and the tapered

wing, which necessitates the cutting of several varying-shaped ribs.

By studying the arrangement drawing of the model shown on pages 318 and 319 you will see that the fuselage is built up on a special 'keel' unit which has been drawn out separately at the top of the plan. Apart from the curve at the front of the keel and the two small curves at the wing-mount, the rest consists of straight lines. So with the aid of the scale at the bottom of the drawing and the 1/4 in. hatched squares, draw out the

shape full size on stiff white paper.

Before assembling the framework, made up from lengths of 1/8 in. square balsa, trace the shapes of the flat sheet at the front of the keel, the wing mount, and the sheet filling at the rear end, transfer them to 1/8 in. sheet balsa, and cut them out. Now build up the framework between panel pins positioned at the side of the lines representing the long main members (Fig. 1), and cement the cut-out sheet pieces in place. Also cement the rectangular piece of thin

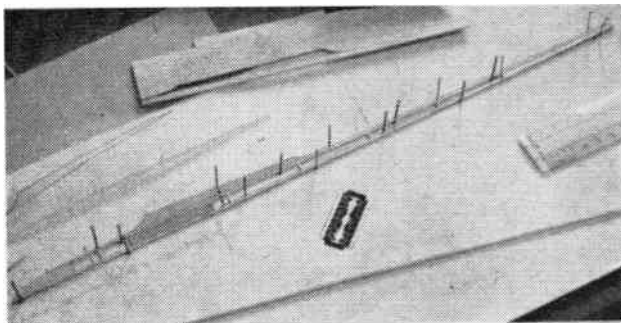


Fig. 1

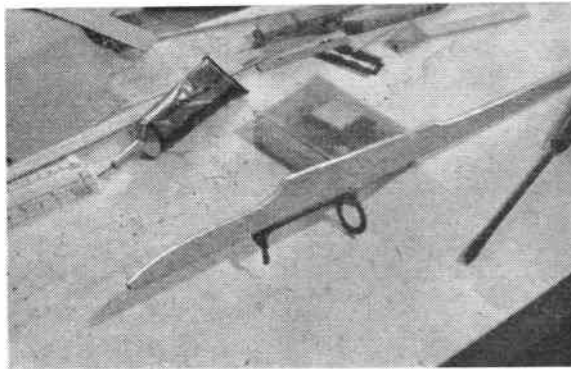


Fig. 3



Fig. 2

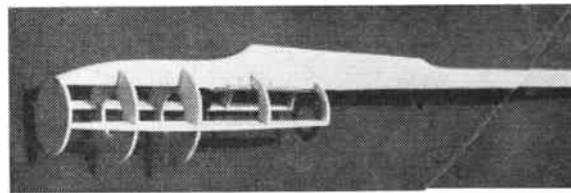


Fig. 4

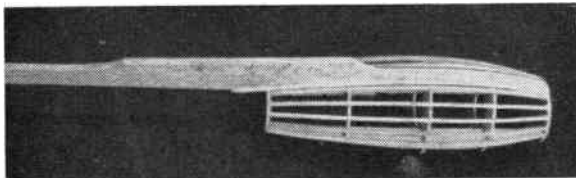


Fig. 5

hardwood or 1/8 in. plywood in place inside the structure under the wing mount. Make sure that your drawing has been rubbed with a candle at all joint

positions to prevent the cement from sticking to the paper.

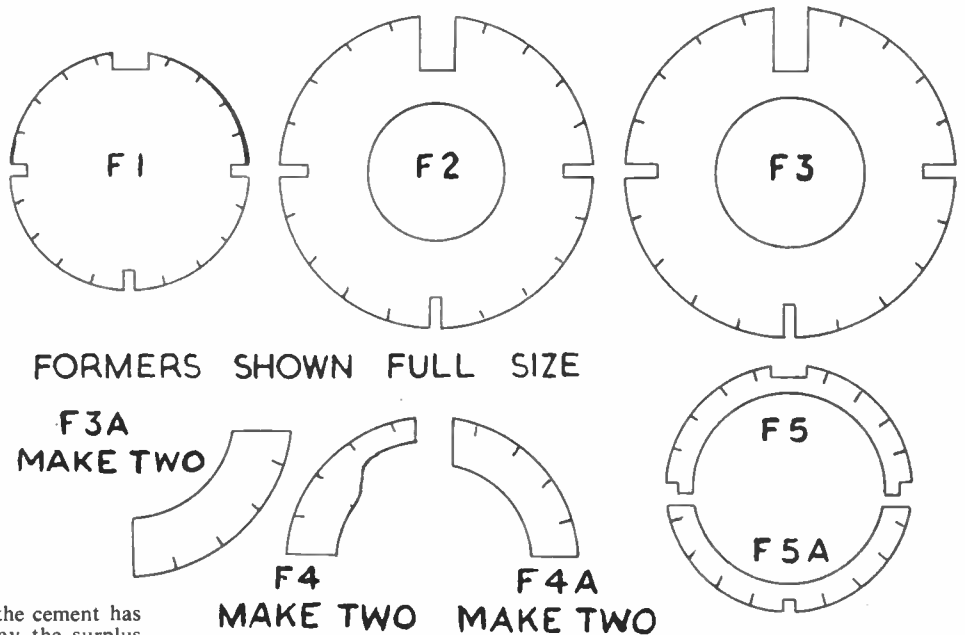
When set, make slots in the bottom of the structure, as indicated, by cutting away portions of the $\frac{1}{8}$ in. square member. The long slot is to accommodate the platform for the motor spring-clip attachment, and the small one 'mates' eventually with the slot in the top of former F 5.

Remove the structure from the drawing and trim the sides free from any hard cement projections. The entire unit is now sandwiched between sheet balsa. Cement one side of the structure, lay it down on a sheet of $\frac{1}{8}$ in. medium hard balsa, and keep it flat by placing books, etc., on top of it. When the cement has thoroughly set, trim away the surplus balsa with the modelling knife. Repeat this for the other side of the structure, then continue the slots in the bottom edge to the balsa sides (Fig. 2).

Cut the motor clip platform from $\frac{1}{8}$ in. plywood or hardwood, and cement it in place in the front slot, then face the underside of it with asbestos paper — supplied with the Jetex motor. Also supplied with the Paa Master is a motor retaining clip and two tiny wood-screws. Fit the clip in the exact position indicated on the drawing, making sure that the screws are driven vertically and centrally into the plywood or hardwood in the internal structure (Fig. 3).

The formers for the fuselage 'pod' are reproduced here full size for your convenience. Trace their shapes, transfer them to medium hard $\frac{1}{8}$ in. sheet balsa, and cut them out. Mark the positions of all stringers with a soft pencil, as indicated, and also mark the positions of the formers on the side of the completed fuselage keel.

Cement formers F 1, F 2, and F 3 in position on the keel (the fit must not be too tight or too slack), and check their squareness with the keel by using a small pre-cut right-angle triangle of balsa. Using the hatched drawing as a guide, mark out and cut the three main longerons. Cut the slots as indicated and cement two of the longerons in place, so that they engage with the slots in the sides of the positioned formers. Make sure that these longerons are parallel with each other by checking the width between them at their rear ends where F 5 must eventually make a neat flush



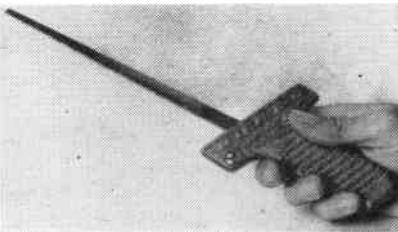
fit. Cut the two pieces which constitute former F 4 and also cut former F 5. Cement these in place (Fig. 4).

On the rims of the formers, above the $\frac{1}{8}$ in. side longerons, cement the $\frac{1}{8}$ in. square stringers in position, using your pencil marks as guides. Note that on former F 1 the stringers terminate on its rear face and on former F 5 they finish on its forward face. It is easy to fix these stringers if you first cement them to formers F 2, 3 and 4 and, when set, bend the ends and trim them to clip neatly in position on formers F 1 and F 5.

Two further stringers, cemented to the face of the keel, one at each side,

serve to support the eventual tissue covering and to provide 'platforms' for one edge of each of the pod fairings at the rear. These stringers are shown in solid black on the drawing of the fuselage and on the arrangement of the former drawing immediately below it. To allow the stringers to pass former F 5, cut $\frac{1}{8}$ in. square notches in the rim of F 5 adjacent to the keel. When set, cut these stringers flush with the underside of the keel (Fig. 5).

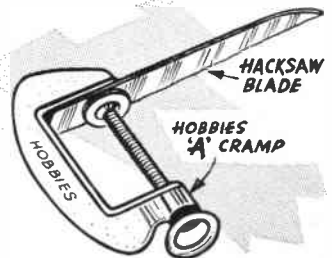
In the next article we shall be completing the 'Hobby Sprite' ready for flying.



IN an emergency, a keyhole or padsaw can be improvised from a hacksaw blade and a Hobbies 'A' cramp. Cut the blade to the required length, grind the end to a point, and use as in the illustration below.

A New Padsaw — and an Improvisation

A HANDY feature of the Rolls padsaw is its three-way application to facilitate work in awkward places. There is the pistol grip obtained with the light alloy handle for normal straight sawing, the inverted blade (as illustrated) for easier cutting close to the floor or wall, and the file position for horizontal working. Complete with a padsaw and hacksaw the set costs 7s. 6d. from ironmongers, tool stores, etc.



NOVELTIES IN SHELLCRAFT

WHILE seashells can be used for all kinds of decorative work on boxes, they may also be combined to make attractive novelties. On the seashore you will find many types of small, pretty shells such as winkles, limpets, whelks and razor shells, but it is also possible to buy bags of assorted ones from handicraft shops.

some Barbola paste for fixing purposes, while water colours, nail varnish, quick-drying lacquers and the like will do for colouring. We should also mention that there are some pearly lacquers available which look most effective when applied to the shells, and a final protective coating of clear nail varnish or Barbola varnish is always advisable, apart from the brilliant gloss they give.

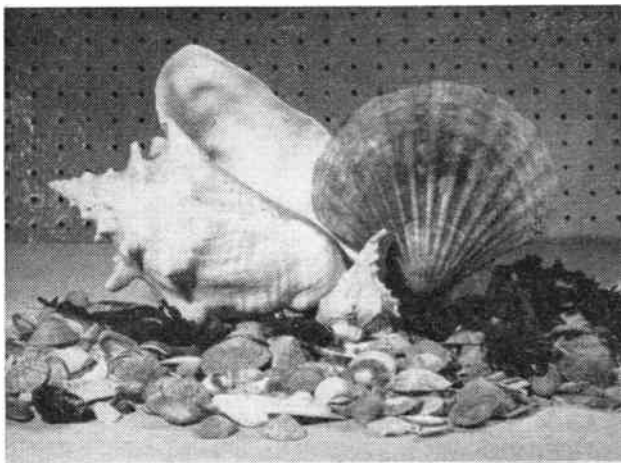
fill the centre, the aim being a symmetrical arrangement. Next transfer the shells to cardboard in the final arrangement so that there will be no trouble when fixing.

There are two methods of fixing, both of which are quite simple. Mix a small quantity of plaster filler, and layer it on top of the box to a depth of about $\frac{1}{2}$ in. The shells are transferred from the cardboard to the top in their correct order before the filler sets, and this will hold them firmly in position. There will be some plaster showing between the shells, and this may be covered with pieces of broken shells or textured into a relief pattern by dabbing with the end of a knitting needle or a thin stick of wood, and finally coloured with water-paints.

Alternatively, the shells may be fixed one at a time by means of a little transparent cement applied to the base. Sometimes it may be necessary to fix a ball of Barbola paste to the inside of the shell, smearing with cement before attaching to the box.

When fixing shells to boxes which have hinged lids, it is essential that those surrounding the outside should be reasonably thin, for if they protrude too much they will prevent the lid from opening. Moreover, you must always apply the shells on a flat surface, or they will slide before adhering. You may apply shells to the top and sides or to the top only as desired.

Once the shells have been applied, we can start to colour. Many pretty shells will require no further treatment other than the application of varnish, but



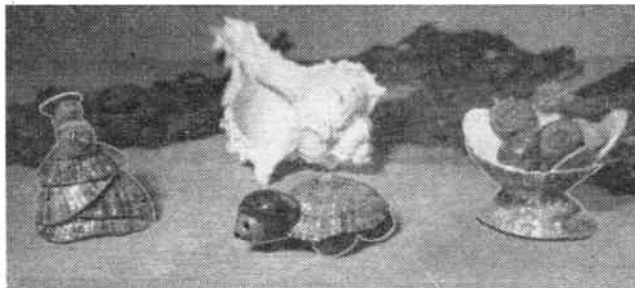
Some shells collected from the beach together with examples of tropical shells

Sometimes the larger tropical shells such as murex, conch and scallops are washed up, or found in the fishermen's nets, but it may be easier for you to buy this type. Obviously, the shells should be thoroughly washed and cleaned before using, and the best way is to place them in a vessel, add some detergent, and leave for a short while. Household bleach is also very good for removing dirt and grime. The shells should be swished around in the soapy water, which is then drained, followed by a final rinsing two or three times in clean water. They may then be laid out to dry on an old newspaper. Do not discard any broken shells, for small pieces are often found useful for filling bare portions of a design.

You will find that most of the shells are reasonably tough, although some may be on the brittle side, but a few simple tools will enable you to cut them as desired. A small hacksaw will easily cut a limpet, while an archimedean drill will make a hole where necessary. You will also need a file and glasspaper for trimming any broken edges. Other equipment is mainly confined to colouring and fixing. You should acquire a tube of transparent china fixative, a packet of proprietary plaster filler, and

Many wooden articles can be decorated with small shells by laying out in a design and fixing to the article. We may decorate such things as letter holders, cigarette boxes, trinket boxes and similar ware, first deciding on an attractive pattern, while you can also in-

On the left, an example of the crinoline lady; in the centre, a tortoise, and on the right a bowl of shell flowers.



corporate an initial or name in the design.

Having collected a large assortment of small shells, we will assume that we are to decorate a cigarette box. With the box before you, the shells can be quickly assembled on the top in order to decide a suitable pattern. A frame of small winkles would probably look very well as a border, with a pleasing pattern to

since this medium darkens some winkles and limpets, it is advisable to apply a water-colour or lacquer.

The production of small novelties from shells alone is entirely different from the decorative process just mentioned, for we use nothing else but shells, cutting and shaping as desired. Your own ingenuity will help you to make many interesting items.

A tortoise is quickly made from five winkles and a limpet. The latter is filled with plaster filler and four winkles impressed to represent the feet. Another winkle is attached to the top by means of cement to represent the head. Finally, the feet are painted black, the head similarly (but adding the eyes and mouth), and the body coloured in brown; the whole being given a finishing coat of Barbola varnish.

A crinoline lady is made from four limpet shells, each a little smaller than the other, a winkle, a very small shell for the head, and another for the hat. Again the limpets are treated with a small application of filler on the inside and piled one on top of the other to make the skirt. Three of these are fixed at a slight angle. A winkle is glued on top for the body, and on top of this is a tiny shell for the head. The latter are

not always easy to find unless you have good eyesight and plenty of patience; so it is often the practice to make a small ball of Barbola paste for the head, smearing with cement, and attaching to the body. The hat is another small, flat shell shaped with a file and cemented to the head. The skirt and body are tinted with water-colours, hair, eyes and mouth added, and the whole finally varnished.

A little bowl of 'shell flowers' can be made from two limpets. Cut away the top of one limpet to make a large hole, when the upper one can be cemented into position. The top limpet is filled with plaster filler and the oddments impressed, coloured and varnished. You may also include a few artificial stamens if desired.

In all the examples described, surplus filler or cement should be scraped away with a knife before applying the colour-

ing and varnish. No doubt these novelties will enable you to think of some other ideas. For example, it is possible to transform the bowl into a basket by cutting a thin strip from another limpet shell to make a handle, attaching this strip vertically inside, filling with plaster, and then adding the other shells. Shell flowers can also be made by using paper-covered wire for the stalks.

Large scallop shells can be used for ashtrays and the like, but here it is often advisable to attach a couple of limpets on the underside. Where an ashtray is intended, it is safer not to colour or varnish, for the cigarettes would destroy the decoration. At the same time, you may paint a design on such a shell if intended for a wall decoration. (S.H.L.)



Outside

MUCH will depend upon the severity of the weather this month, but as the days lengthen, flower borders, rose beds, rockeries, etc. should have the surface stirred, with a fork or rake. Climbing shrubs, such as honeysuckle, clematis, and jasmine, may be planted. Herbaceous plants may be divided and replanted, using pieces from the outside of the clumps. Plant new delphiniums. Use the mower if weather turns warm and dry.

ROCKERIES can be made or rebuilt this month. Keep them away from overhanging trees because of damage caused by dripping water. Protect rock plants coming into flower, using pieces of glass.

In the **FRUIT GARDEN**, gooseberries and currants may be pruned. Tie in loganberries, training stems horizontally or fan-wise. Clean up strawberry bed. Stir the surface soil, and give a dressing of compost. Protect wall fruits from frost; fish net will prove useful.

In the **VEGETABLE PLOT** a few seeds may be sown towards the end of the month, and given cloche protection. Make a start with lettuce, radish, summer cabbage, and red cabbage.

Plant shallots. Sow onions, leeks, and cauliflowers under glass. Seed potatoes may still be purchased and set up to sprout. If you wish to chance extra early crops, try sowing peas (round seeded), and broad beans. Dig celery, pea and runner bean trenches. Use plenty of compost or stable manure.

Inside — warm house

MAKE sowings of tomatoes, lobelia, tuberous and fibrous begonias (try some of the tuberous hanging varieties), gloxinias, coleus, and antirrhinums.

Bulbs, cinerarias, hydrangeas, azaleas, primulas and schizanthus may be brought in from the cool house to force into flower. Fuchsias, heliotrope and dahlias are started off to provide cuttings. Inspect cacti for mealy-bugs. These are tiny white insects which are killed by methylated spirit, applied with a fine pointed brush.

Cool house

WATERING may be increased towards the end of the month. Take chrysanthemum and carnation cuttings if bottom heat can be provided. Ventilate well during open weather.

FEBRUARY

THESE NOTES REFER CHIEFLY TO MIDLAND GARDENS — DUE ALLOWANCE SHOULD BE MADE FOR CHANGE OF LATITUDE.

Cold house

STIR the soil round lettuces. Fumigate for greenfly on a mild evening. Watch for slugs on chrysanthemum stools. There is still time for repairs, painting, and cleaning if the house is clear.

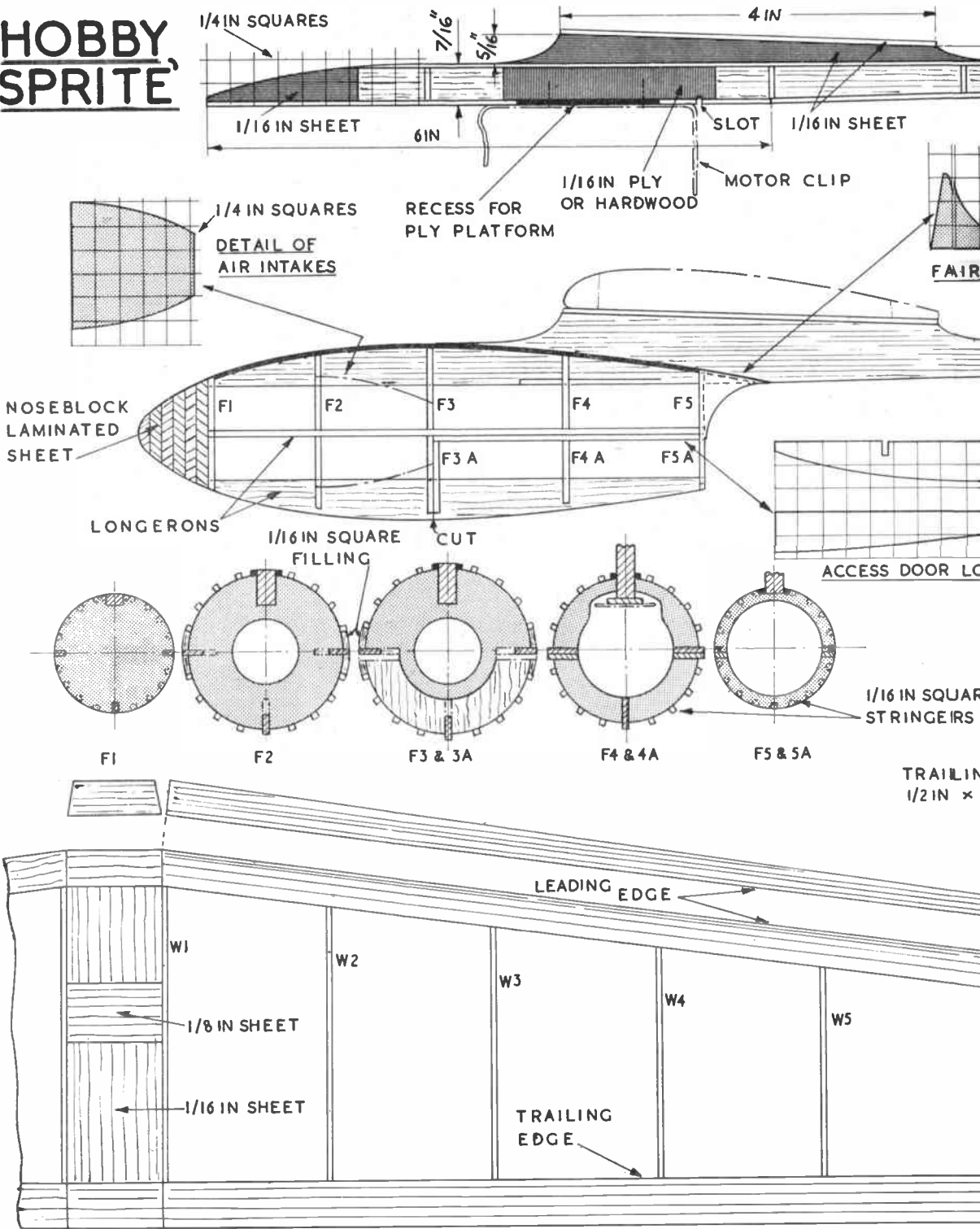
General

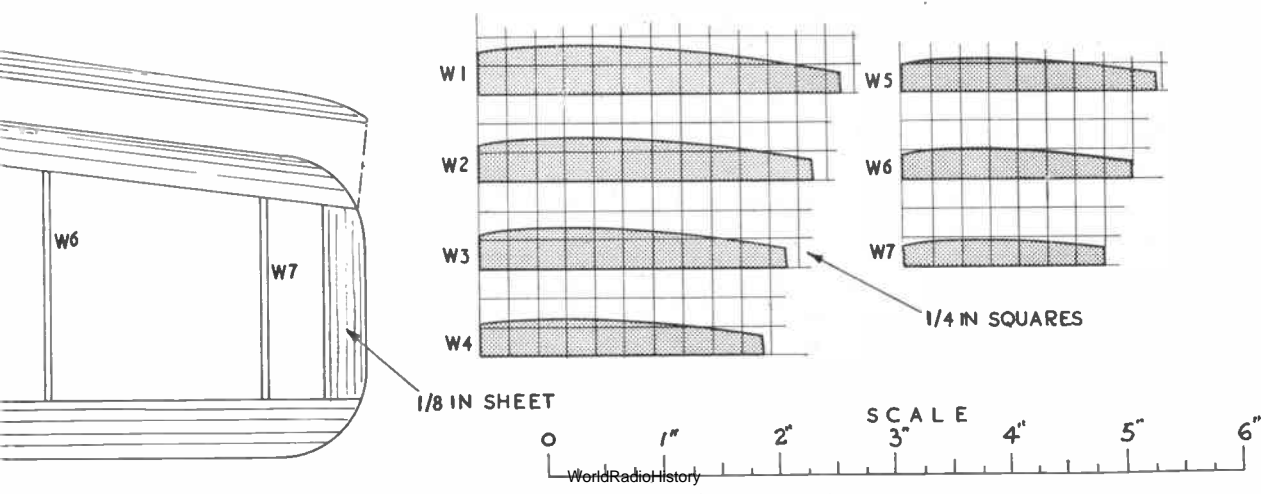
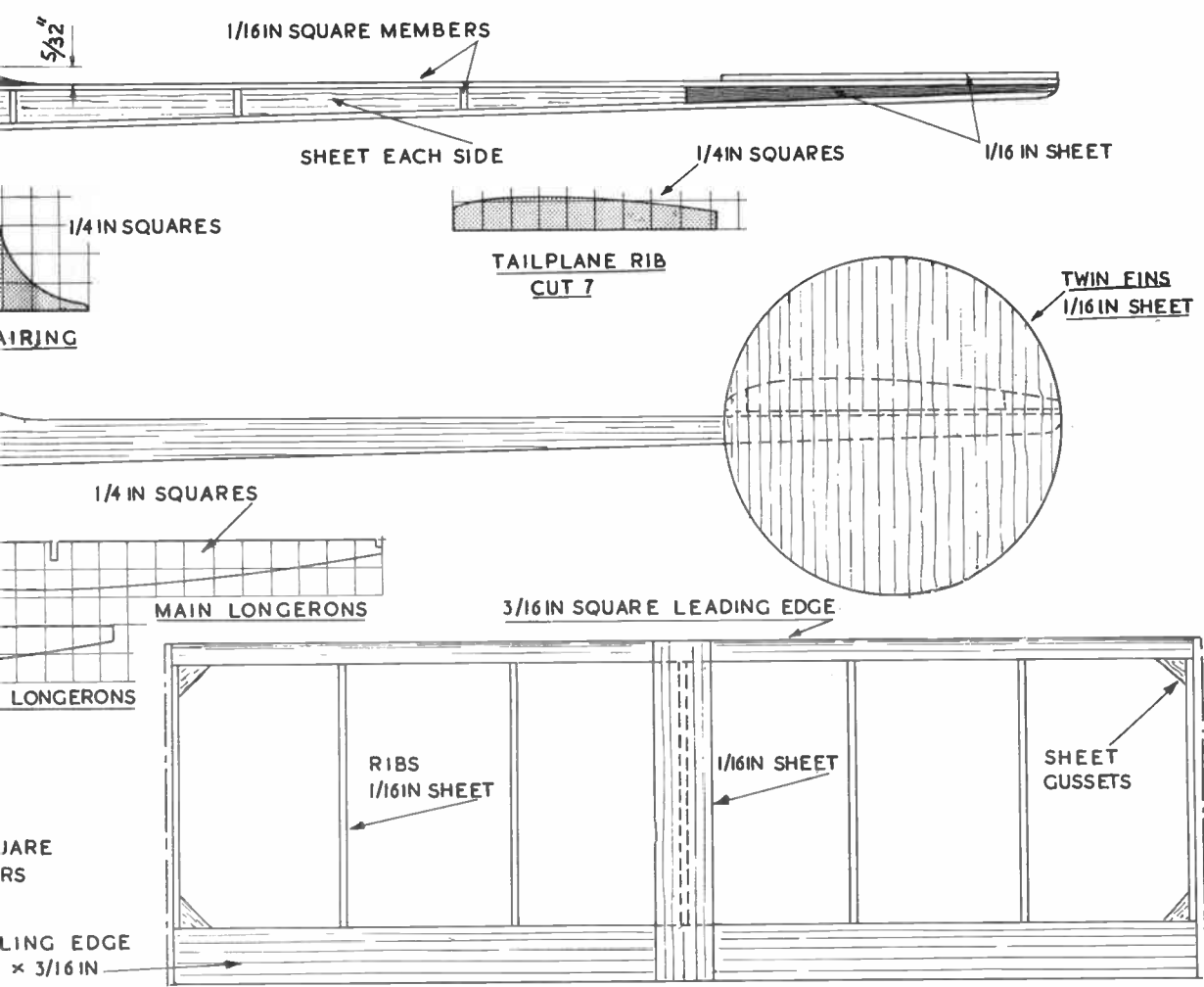
MAKE or renovate seed boxes. Gather moss for hanging baskets. Scrub down frames and repaint. Clean out ditches. (M.H.)

NEXT WEEK

Next week's free design will be for making a substantial bookcase standing on contemporary legs. There will also be articles and patterns to interest all readers. Make sure of your copy.

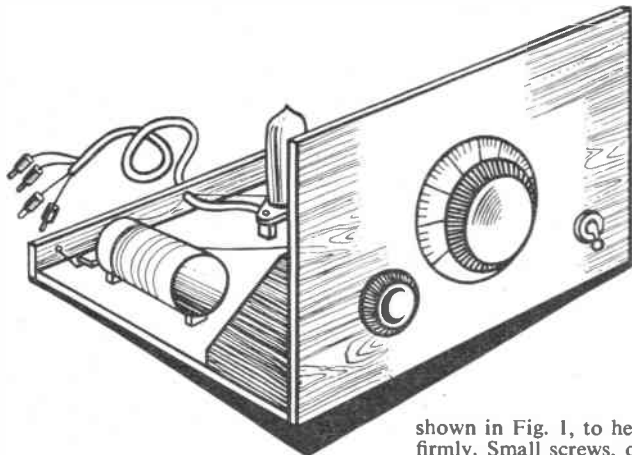
HOBBY 'SPRITE'





AN ALL-DRY SHORT WAVE I-VALVE SET

By F. G. Rayer



QUITE a number of distant short wave stations can be picked up with a 1-valve receiver, because short-wave signals travel much farther than long- and medium-wave transmissions. Amateurs can also be heard with the set described here, which is economical to run, and uses a 1T4 valve, or equivalents such as the CV785, W17, IF3, or DF91, any of which can be inserted without changing wiring.

If local B.B.C. programmes are wanted, the set can easily be arranged to tune to the medium-wave band (about 200 to 550 metres). It is otherwise intended for short-wave listening between about 19 and 42 metres.

The baseboard is of $\frac{1}{4}$ in. thick or similar wood, about 5 in. by 6 in. The panel is 3-ply, 6 in. by $4\frac{1}{2}$ in. high. Two brackets are cut from $\frac{3}{8}$ in. wood, as

shown in Fig. 1, to help hold the panel firmly. Small screws, or panel pins and glue, will hold these parts together.

For aerial, earth and phone connections a 4-way socket strip can be used, or a piece of Paxolin or ebonite about 1 in. by 6 in., drilled for four terminals or

bolts. Screws hold this strip to the rear of the baseboard.

An H.F. choke can be wound on a piece of wood or insulated rod $\frac{1}{4}$ in. to $\frac{1}{2}$ in. in diameter and $1\frac{1}{2}$ in. long, five $\frac{3}{4}$ in. diameter card washers being cut to fit the dowel, insulated rod or tube. These washers, one of which is shown in Fig. 1, are fixed about $\frac{1}{4}$ in. apart. Touches of glue will hold them, and also the small choke supports, cut from $\frac{1}{4}$ in. wood, which go between the ends of the choke and the baseboard, to hold the finished choke in position.

Choke windings

So that enough turns can be put on, thin wire of about 38 to 42 S.W.G. is needed, enamel or silk covered. The exact number of turns does not matter, but there should be at least 100 in each space between the washers, making at least 400 in all. The turns need not be counted, winding continuing until the spaces are almost filled, as in Fig. 2.

To begin, pass the end of the wire through a small hole made in one outside washer, leaving a few inches free for connecting up. One space is then wound nearly full. The wire is then taken through a small notch into the second space, which is wound nearly full in turn. This is continued until the four spaces are used, all turns being in the same direction, and the wire is cut off and the end passed through a small hole in the last washer. The choke windings should not be varnished or painted.

Tuning coil

One coil will allow the most useful part of the short wave-band to be covered, but other coils can be wound for other bands. In small receivers of this kind, plug-in coils are often used. These can be bought ready made, or pronged formers for home winding can be used. Or old valve bases, with paxolin or card tubes attached, will do well. If so, connections in the set are taken to another valveholder, and the required coil is simply inserted in this.

The coil can be wound on a strong cardboard tube, or on Paxolin or ribbed coil formers. A tube about 1 in. to $1\frac{1}{2}$ in. in diameter will be best, and it will need to be about 2 in. long. The finished coil is held to the baseboard by means of screws, as in Fig. 1.

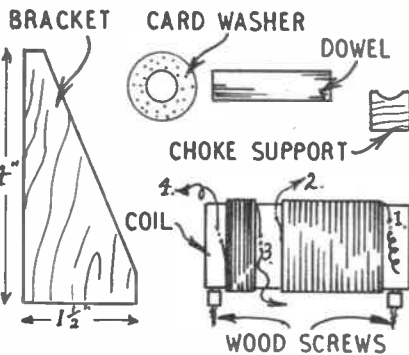


Fig. 1—Panel bracket, choke and coil

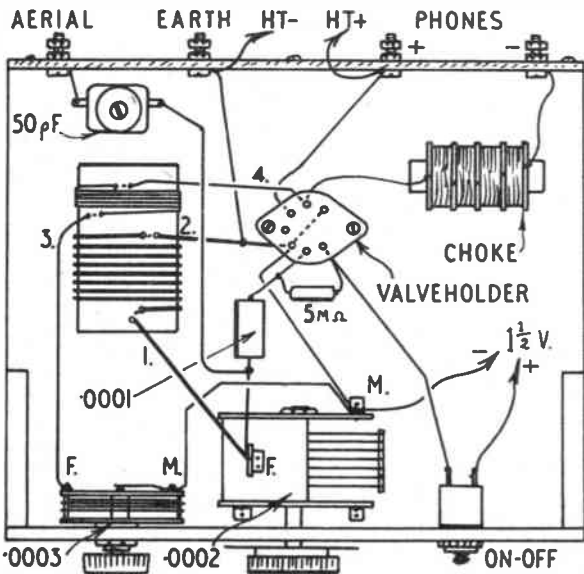


Fig. 2—Complete wiring plan

Using a $1\frac{1}{2}$ in. diameter former, 9 turns of 20 S.W.G. wire will do for about 19 to 42 metres. Space the turns by about the diameter of the wire, as in Fig. 2. The wire may be bare, or enamelled. Leave ends long enough to reach the fixed plates of the tuning condenser 'F' and the earth line, as in Fig. 2. Lead 1 is the beginning of this 9-turn winding, and lead 2 the end.

For reaction, 7 turns will do. This winding begins at lead 3, which goes to the fixed plates of the $\cdot 0003\mu\text{F}$ reaction condenser, and ends at lead 4, which goes to valve anode. Enamelled or other insulated wire is used for reaction, from 26 to 32 S.W.G. being suitable. Turns are side by side. All turns in both windings are in the same direction, and there is about $\frac{1}{4}$ in. free space between windings.

A medium-wave coil can have 70 turns of 32 S.W.G. enamelled wire between points 1 and 2, with 50 turns of 32 to 36 S.W.G. between points 3 and 4. The turns are side by side, as in Fig. 1.

Wiring up

All connections and parts are shown in Fig. 2. With both variable condensers 'F' indicates the fixed plates tag or terminal, and 'M' the moving plates.

Some of the 20 S.W.G. wire will do for wiring-up, and insulated sleeving is not needed if leads are kept clear of each other. All connections should be fairly short and direct. If tags and the ends of leads are bright and clean, soldering will be quite easy, and no extra flux is necessary when using cored solder.

A few feet of thin flex will be needed for battery connections, which should be marked so that no mistake can arise when joining up the batteries.

Baseboard valveholders are not made for this kind of valve, so a chassis holder has to be fixed about $\frac{1}{2}$ in. above the baseboard, by using blocks of wood. Fig 2 shows valveholder connections as they will actually be in the receiver; that is, with the valveholder seen from above. In valve books, etc., pins are shown when looking at the valve or holder from below, and will thus be different.

Wiring will be simplified if leads are soldered to the holder tags before finally screwing the holder down. Looking at Fig. 2, and counting the socket tags clockwise, connections should be checked against the following:

- 1, to switch and 5 megohm resistor.
- 2, to 5 megohm resistor and $\cdot 0001\mu\text{F}$ condenser.
- 3, Earth, 2 on coil, moving plates of condensers.
- 4, not used.
- 5, H.T. positive.
- 6, 4 on coil and H.F. choke.
- 7, wired to tag 3.

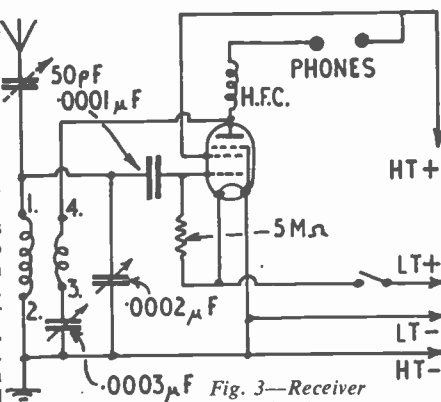


Fig. 3—Receiver circuit

Tuning

Short-wave tuning is very sharp, and it is best to fit a reduction drive to the $\cdot 0002\mu\text{F}$ condenser. The simplest type is that known as an epicycle drive, and fits on the condenser spindle. The condenser has to be set back from the panel slightly, to accommodate it. Some tuning condensers have fixing feet, which can be screwed to the baseboard. Others have a bush, with nut to lock the condenser to the panel, as shown for the $\cdot 0003\mu\text{F}$ reaction condenser.

If a $\cdot 0001\mu\text{F}$ or $\cdot 00015\mu\text{F}$ short-wave tuning condenser is to hand, it can be used instead of $\cdot 0002\mu\text{F}$. For reaction, a capacity of $\cdot 0002\mu\text{F}$ or $\cdot 0005\mu\text{F}$ can be used instead of $\cdot 0003\mu\text{F}$, if already

available. If the set is to be used to tune medium-waves, then a tuning condenser of $\cdot 0003\mu\text{F}$ or $\cdot 0005\mu\text{F}$ will be better because it will allow higher wavelengths to be reached. The capacity of the condenser will not affect efficiency, but the full $\cdot 0005\mu\text{F}$ is not really required for short-waves only.

About listening

The usual phones as employed for crystal or 1-valve sets are most satisfactory, and will be of medium or high impedance. They are taken to the two terminals in Fig. 2.

For H.T., a 60V or 67½V battery may best be used, though a 45V battery gives quite good results. As there is only one valve a small layer battery will last a long time.

Only 1½V is required for filament, and a higher voltage must never be used. This supply can be obtained from a 1½V portable battery (take care not to use the 7½V type), or from a single flash-lamp type cell.

It is quite possible to pick up stations thousands of miles away with a few feet of wire as an indoor aerial, but a reasonably good indoor or outdoor aerial will give better volume. An earth is by no means necessary, but also improves results.

The setting of the 50pF aerial trimmer greatly influences reception. If closed down too much, tuning is flat, and reaction may no longer be obtained on some wave-lengths, especially with a long aerial. To begin with, this condenser is best set almost fully open (minimum capacity). For short-wave listening, a suitable condenser can be made by twisting together two insulated wires for a few inches. There is then no actual electrical connection to the aerial wire, coupling being by means of the capacity existing between one wire and the other.

With the set switched on, the reaction knob should be slowly turned until the set is nearly oscillating. This is very important indeed when listening to weak signals, and reaction should be adjusted, in conjunction with tuning, to keep the valve in its most sensitive condition.

If the set cannot be brought up to the oscillation point on low wave-lengths, this usually shows that the aerial coupling is too tight. This can be cured by unscrewing the 50pF condenser a little, or by reducing the extent to which the insulated wires mentioned overlap.

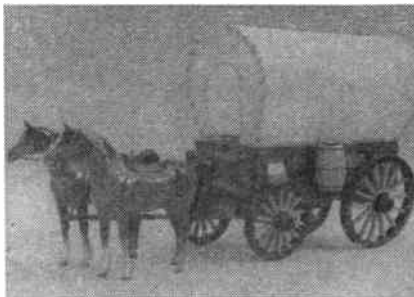
Should reaction be very violent, aerial coupling is probably too loose, and the condenser should be screwed down, or the capacity of the overlapping wires increased by twisting them together for a little extra distance. The best capacity actually depends on the aerial, and is not very critical.

Constructors who prefer to wire from a theoretical circuit, or check against this, should see Fig. 3.

An attractive Lamp

A PAIR of horses make a most attractive addition to this model of a Covered Wagon Table Lamp made from Hobbies Design No. 3156 by Mr C. S Payne, Three Ways, Ashby Road, Hinckley, Leics.

This charming and useful novelty is 12 in. long by 10½ in. high and looks well standing on a television. The kit contains all materials for making, including wood, wire, Crinothene, plastic thonging, flex and electrical parts, and costs 23/6 (by post, 2/- extra).



Get ready for Spring

SOME HANDY GARDEN AIDS

THERE are many handy garden aids needed in the Spring of the year, some to protect growing plants against depredations of the birds, while others ease the work. Those described here can be quickly knocked together from odd pieces of wood.

Fig. 1 shows a useful type of plant guard made from scrap wood, $\frac{1}{2}$ in. thick, with two legs nailed on one side. The latter should be at least 18 in. long; the guard about 8 ins. high and made just a little wider than the row of plants. You will see that the corners have been shaped and clout nails hammered in for stringing with black thread. Two such guards are required for a normal row of peas, but if the row is rather long it may be advisable to include an additional support in the centre of the row.

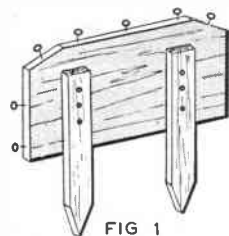


FIG 1

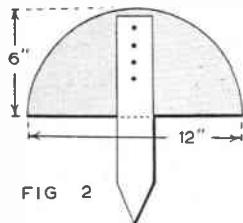


FIG 2

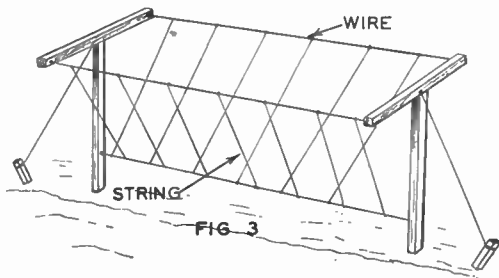


FIG 3

An even better form of protection against damage to crops by birds or cats is a wire netting guard, but this is more expensive. If you can afford such netting, the endpieces should be shaped as in Fig. 2. It is better to insert small screw hooks in the edge of the wood rather than fasten the netting permanently with staples, since it can then be removed and stored away at the end of the season. You should also prepare some wire hooks for holding the 1 in. netting near to the ground level at the edges.

In Fig. 3 we show a method of making a 'hurdle' for growing peas or beans, and this will be particularly useful for the town gardener who cannot obtain twigs and branches. Two or three 'T'

pieces are required, made from 2 in. \times 2 in. material as shown in the diagram, the cross-member being just a little wider than your row and the uprights at least 18 in. longer than the expected height of the crop. The latter should be pointed at the end for driving into the ground.

A screw-eye is fitted to each of the inside ends of the 'T' pieces to hold a

By H. Mann

strong wire which joins them together, and a similar wire runs between the bases of each upright. You may then attach garden twine from the lower wire to the upper wires alternately in the form of a V as shown. Owing to the

on to the base, sandwiching the wire meshing, which should be of a size to suit the job in hand.

A leg has been provided so that the sieve can be placed on the ground and the soil, etc., shovelled in, and the riddings fall to the ground. A hinge is fitted to the top of this leg which can then be folded back for easy storage. It is advisable to thread a cord through the leg and fasten so as to give stability.

Although these garden aids may be made from scrap wood it is advisable to treat them with a recognized preservative, such as Rentokil, that is not harmful to plant life.

If slugs and snails happen to be one of your particular worries, the best protection is undoubtedly a metal collar to fit round the base of the plant. Chrysan-

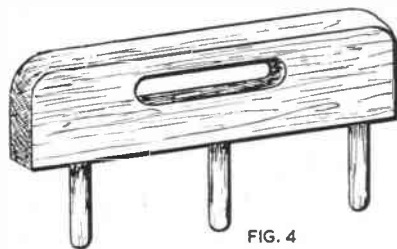


FIG. 4

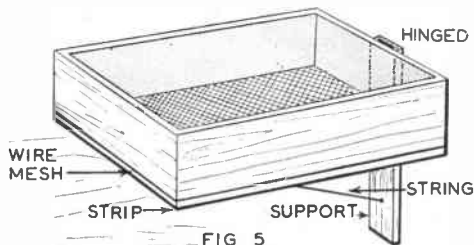


FIG 5

tension on the wires it will be found a wise precaution to knock a peg in the ground at each end and fasten with another wire. Old insulated aerial wire is ideal for this purpose.

The task of planting various vegetables can be both eased and speeded up by the preparation of dibbers as shown in Fig. 4. The $\frac{1}{2}$ in. dowel pegs can be 3 in., 6 in., or even 12 in. apart, according to the type of vegetable being planted. For comfortable working a handgrip has been prepared.

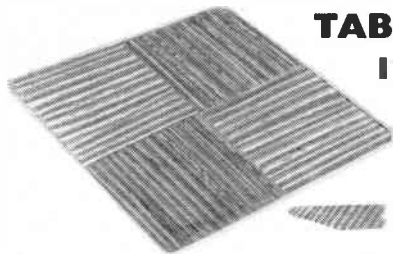
Fig. 5 shows a useful type of sieve. A frame is knocked together from available material to any desired size and a suitable wire meshing fastened to the bottom edges by means of staples. Strips of 1 in. material should be nailed

them up as they are very attractive to these pests when they are first planted out, but all you need is a strip of thin sheet zinc or galvanized iron about two inches wide and long enough to make a collar about $3\frac{1}{2}$ in. in diameter. If the ends of the strip are turned over for $\frac{1}{4}$ in., but not hammered flat, they will hook together after placing around the base of the plant and just pushing into the soil a little.

QUIZ ANSWERS (see page 313)

1. Cogging Joint. 2. Architrave. 3. Bressomer. 4. A rough wall made of masses of vitrified brick. 5. Clap Boards.

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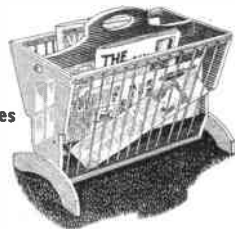
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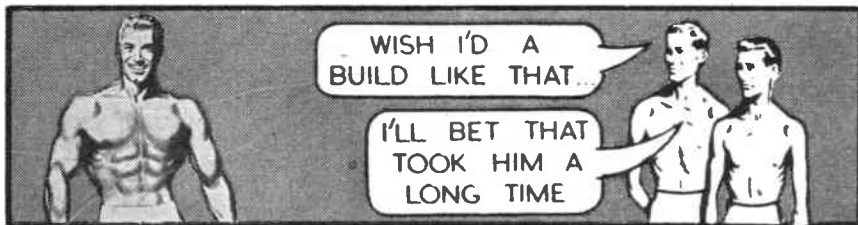
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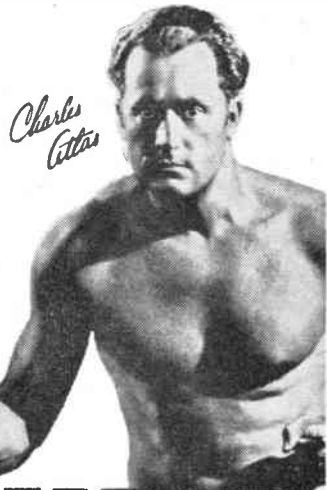


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ADDRESS

SURFACE TENSION TOYS

PERHAPS you have often wondered why certain insects, like pond skaters and water boatmen, can with care move about over the surface of a pond without sinking or even getting wet. The reason for this is that the millions of minute particles or molecules, of which water is composed, cling together much more firmly at the surface. In this manner a thin elastic-like skin is formed, which acts as a barrier between the liquid and the air above it. This phenomenon is called 'surface tension', and it occurs with all liquids. The insects are supported by this elastic barrier, and if you look closely you will actually be able to see where their spread out legs make little dents in the surface skin.

Study the odd behaviour of these surface-skimming animals by making a model insect (Fig. 1). Use a matchstick for the creature's head and body, and

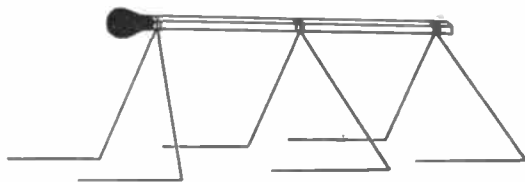


Fig. 1

With other liquids, the strength of the surface skin varies considerably. The surface tension of mercury, for example, is remarkably strong, whilst that of oil is much less than water produces. A paper fish will demonstrate how surface

By A. E. Ward

tension may vary. From fairly stiff paper cut out the simple streamlined fish, shown in Fig. 2. Cut a narrow slot down the middle of the body, from the centre of the body, beginning between the two 'prongs' of the tail. At the end of the slot make a small hole.

Float the fish upon clean water which is contained in a grease-free bowl or bath. To make the fish 'swim', place a

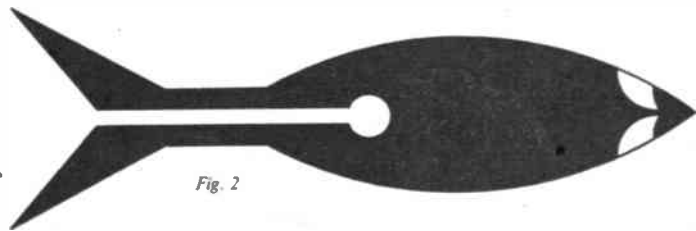


Fig. 2

Use scraps of balsa wood to fashion a little steamer about 3 in. long (Fig. 3). Cut the hull from a 1½ in. wide strip of ¼ in. thick sheet balsa wood. Glue the various parts together with balsa cement. Make a small notch in the stern, before painting the ship in bright colours with dope. Into the notch insert a small piece of camphor. Melt part of the camphor by touching it with the heated blade of a penknife, then it will be possible to make it adhere to the balsa wood.

When you place the boat in a grease-free bowl of water, the camphor will begin to dissolve slowly, and the toy will move along, since the surface tension behind the boat will be weakened by the camphor. If you wish your vessel to sail on a constantly circular course you must fix a little balsa wood rudder, pointing slightly to one side, underneath the stern. Secure the rudder with balsa

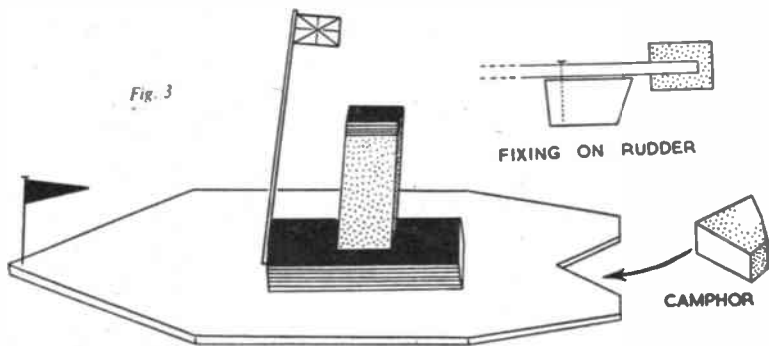


Fig. 3

cement, or make it possible to set it at any desired angle, by mounting it upon a pin thrust downwards through the hull. A camphor boat should sail a considerable distance upon a calm pond.

form the three pairs of legs from light-weight fuse wire. Let the legs be 2½ in. long, and bend them forward at their bases to make flat 'feet' about 1½ in. in length. Render the feet water-repellent by dipping them into melted candle wax. Spread out the legs evenly, and then stand the model carefully upon the surface of some clean water placed in a bowl. The bowl should be free of any grease traces. Observe how the toy insect stays high and dry upon the surface skin.

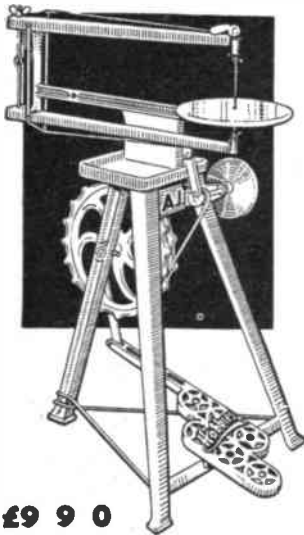
single drop of oil into the small hole. The fish will be propelled forwards as the oil expands along the narrow channel. This happens because the surface tension of oil is comparatively weaker than the elastic skin formed by water. As the oil spreads out over the water behind the fish, the paper toy is attracted by the stronger pull exerted by the water molecules in front.

Another type of surface tension toy, working on a similar principle to the fish, is the camphor driven boat.

TITLES TO PROBLEM DROODLES ON PAGE 311

11. Potatoes Seeing Eye to Eye.
12. Flea with Hiccoughs.
13. Measles Waiting to be Caught.
14. Octopus Kissing His Wife Goodbye.
15. T.V. Toppers.
16. Rhinoceros in a Paper Bag.
17. Army Ants Passing Through Spilt Champagne.
18. Esquimo Moving House.
19. Spectacles Dropped From a Flying Saucer.
20. Frog Man Coming Down a Man-hole.

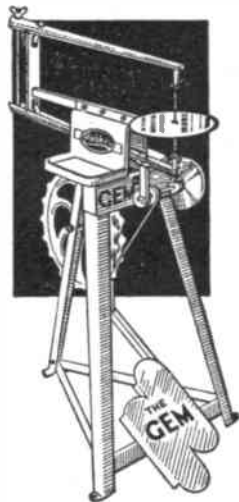
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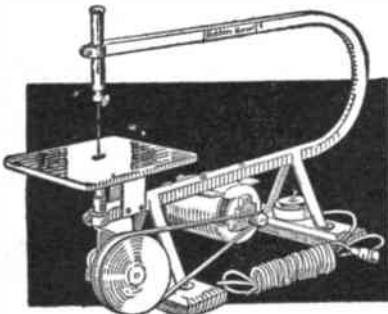
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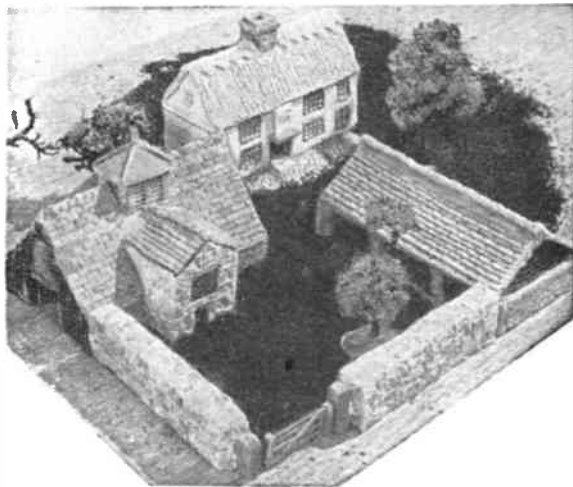
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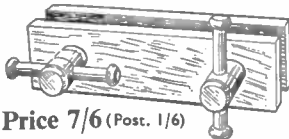
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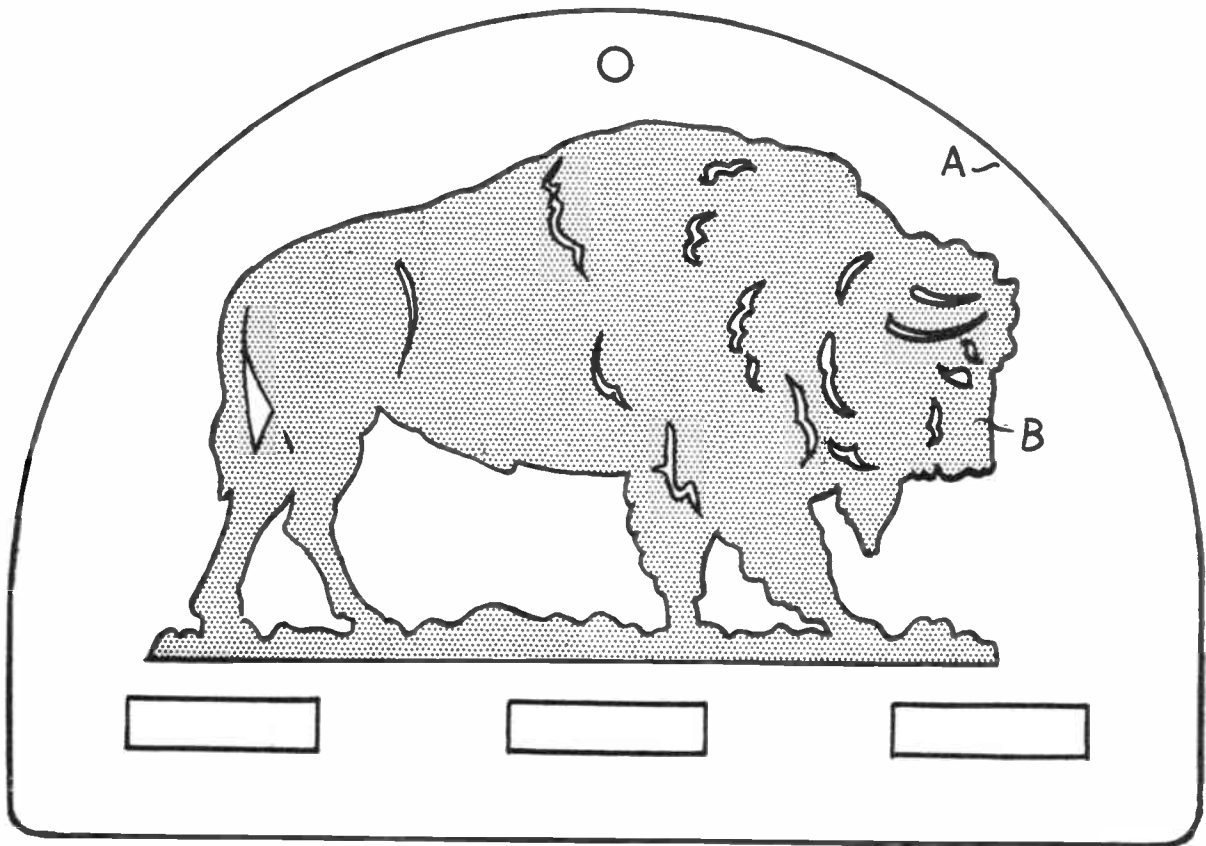
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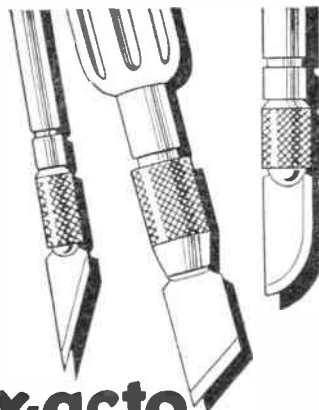
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10th FEBRUARY 1960

VOL. 129

NUMBER 3348

THE ORIGINAL
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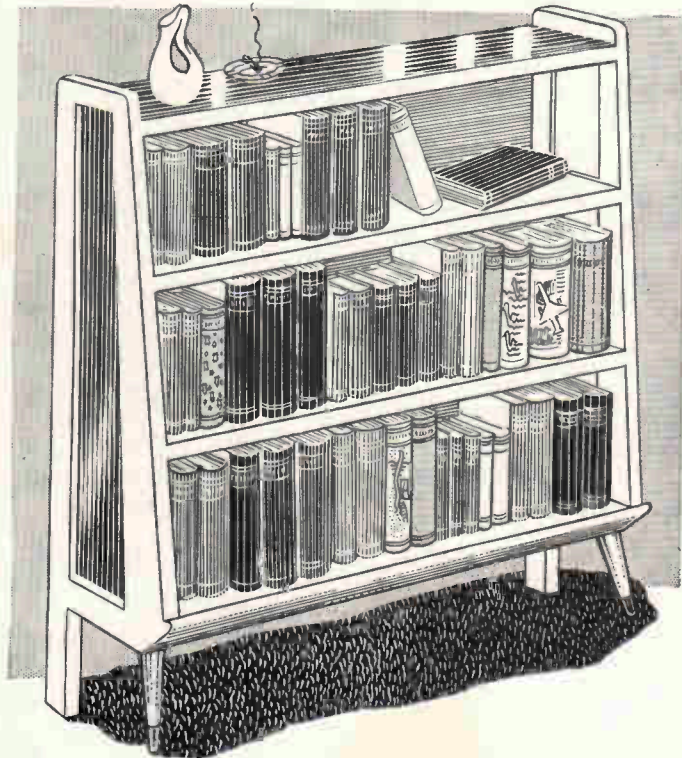
* PATTERN FOR *
* FRETWORKERS *
* Page 343 *

COLLECTORS' CLUB

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A BOOKCASE



Up-to-the-minute ideas

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Pleasant and profitable things to make

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SITUATED in a quiet cobbled-stoned street off Oxford's famous 'High', you will find 'The Bear Inn'. From the outside it looks like a little country pub, with its whitewashed walls, its hanging baskets filled with scarlet geraniums, and its swinging sign which depicts the Bear and Ragged Staff — the ancient emblem of the Earls of Warwick.

What has probably made 'The Bear' more famous than anything else of recent years is the collection of ties which adorn its walls.

TIE'D HOUSE

- By R.L.C.

Landlords up and down the country have manias for collecting things and exhibiting them in their pubs. One near Oxford a few years ago collected clocks. Dozens of them chimed the hour and saved the landlord the duty of uttering those three fateful words at closing time. There are collections of horse brasses, crown corks, firearms, wine labels, foreign money, visiting cards and so on in hundreds of pubs. But the speciality of the landlord of 'The Bear' is ties. Neatly arranged in cases round the walls you will find snippings of club, school, college, and regimental ties — well over two thousand of them — from all over the world. Each one bears a neat ticket on which the description is written and signed by the donor. Just enough of the thin end of the tie is removed (with, and only with, the donor's consent!) with a huge pair of ceremonial scissors by 'mine host'. The ceremony is completed when the donor accepts 'a drink on the house'. Every one of the ties has been given up and autographed in 'The Bear'.



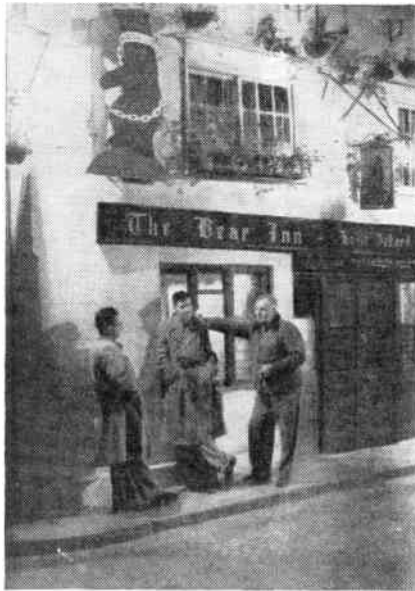
Among the collection, there is an English F.A. International tie which was given by Leeds and England footballer, George Ainsley. Mike Hawthorn gave the British Racing Drivers Club tie. Radio star Tony Hancock gave the Savage Club tie, while the Olympic

Games tie bears the signature of Alf Gallie, who was coach to the British Boxing Team. There are ties signed by English, Welsh, and Scottish Rugby internationals, one signed by the famous Bedser twins of Surrey cricket fame, and a British Empire Games, 1954, Vancouver tie given by Chris Higham, who ran in the hurdles.

When Chris donated the end of his Empire Games tie, the ceremony was filmed in Technicolor by Pathé Pictorial and it was shown in cinemas all over the world. One customer informed the landlord that the reason he was visiting 'The Bear' was that he had seen the film in Aden!

Probably the most distinguished donor to the collection is General Lord Ismay, K.G., P.C., G.C.B., C.H., D.S.O., D.L., LL.D., until recently Secretary General of N.A.T.O. During a conference he was presiding over at Christ Church, Lord Ismay, accompanied by about forty senior officers of N.A.T.O., visited 'The Bear' and, with due ceremony, parted with the end of his N.A.T.O. tie. This very valued contribution now takes pride of place in the military section.

When you visit Oxford, anybody will direct you to the 'Pub with the Ties'. And the hosts, Jean and Stanley Forrester, will be pleased to show you the collection.



More Pen Friends and their Pictures



Colin F. C. Boniface

OUR pen friend service is bringing in letters from all over the world. We now have contacts in almost every country. But would readers please remember that all requests must be accompanied by the reply coupon printed each week in the magazine. And it is important to enclose a 3d. stamp for reply. Address all correspondence to the Editor, *Hobbies Weekly*, Dereham, Norfolk.

Colin F. C. Boniface, of 175 North Road, Westcliff-on-Sea, Essex, collects stamps and labels and will answer all pen friend letters.

Leonard Morton, of 26 Sceptre Street, Sherwood, Nottingham, has spent a 'small fortune' on World Radio History and match



Leonard Morton

labels. He already corresponds with many readers, but will welcome additional friends.

CONTEMPORARY BOOKCASE

THE contemporary bookcase illustrated on the front page makes a substantial and imposing piece of furniture for the modern home. In contemporary style, it has three shelves in graduating widths to accommodate quite a substantial number of books of all popular sizes.

Standing 43 in. high and 36 in. wide, the bookcase can be finished in a pastel shade of enamel or lacquer to match the existing furnishings. It is also designed to incorporate side panels and a top of attractive sapele veneer, which when polished gives a rich and effective contrast. These panels are, of course, included in Hobbies kits of materials.

The bookcase has been designed so as to be quite within the capabilities of the average handyman or even a keen junior with a limited choice of tools. The making of the joints and the assembly of the project are quite simple and clearly explained on the design sheet, and in the instructions which should be carefully studied before starting. Most of the relevant details and measurements are given on the design sheet.

The bookcase is made up in sections, such as sides and shelves, etc., which are then glued and screwed together.

The first step is to make up the two sides, each consisting of pieces A, B, C,

and D, which are all cut from 1 in. wood. Assembly is as shown in Fig. 1, and on the design sheet, which also shows how pieces B are cut from one piece of wood. Incidentally, when cutting the leg portion of piece A leave the length full, to allow for trimming as will be explained later. For those who are working with a Hobbies kit, pieces A, D, and C will be already supplied to section, and, therefore, have only to be cut to the given lengths. Halving joints are used for the assembly, and it will be noted that the corner of B and C may be jointed in the square, and afterwards cut to the angle indicated. To give added strength secure the joints with screws.

The sides are grooved on the inside to a depth of $\frac{1}{2}$ in., and a width of 1 in. to take the framework of the shelves. Fig. 2 shows these grooves, and their positions are given on the design sheet, where it can also be seen how the grooves are made with a tenon saw, and waste wood cleared out with a chisel.

Next make four frames for the hardboard shelves from $1\frac{1}{2}$ in. by 1 in. wood to the sizes shown on the design sheet. Remember the variation in the width of

these shelves, which should be gauged exactly by 'marrying', temporarily, with the sides, and marking off.

Screw the finished frames, temporarily, in position to the grooves in the sides, and mark off ready for planing the front edges to conform with the slope of the sides. Then dismantle, and plane as marked.

To the lower shelf frame (E and F) glue and screw two corner blocks of 1 in.

Hobbies Kit No. 3348 for making the Contemporary Bookcase contains all wood fittings, including veneered plywood for the decorative panels, screw-in legs, etc. Kits from Branches, etc., or post free from Hobbies Ltd, Dereham, Norfolk, price 82/6.

wood cut from a 5 in. square of wood halved diagonally. The shelf frames can now be finally glued and screwed to the sides.

The back N is of $\frac{1}{4}$ in. plywood, which can be jointed in the centre. All plywood edges will be chamfered off, and can either be fixed flush or stopped short $\frac{1}{4}$ in. from the edges as desired. The back is glued and screwed in position to the sides and shelves.

The front rail J (see Fig. 3) is next temporarily positioned in order to mark off for shaping at the top and bottom. Its position is shown on the design sheet. Next add the front legs (Hobbies 9 in. contemporary legs No. 591). Their blocks should be glued and screwed to the lower shelf frame and corner block. After screwing the front legs into their blocks the back legs A may be trimmed for perfect balance.

The next step is to cut and trim the hardboard to fit the three lower shelf frames (not the top of the bookcase). The hardboard is glued to the frames.

The side panels O, and the top P are cut to size from sapele veneered wood. Do not fix them at this stage.

The assembly is now ready for adding the finish. To obtain complete satisfaction in this respect it must be emphasized that preparation must be carried out thoroughly. Fill all screw holes with plastic wood, and level off, then fill all the grain with a woodfiller. Give two undercoats and two top coats, rubbing down between with silicon carbide paper used wet. The side panels and top should be french polished, varnished or lacquered, also after filling the grain. These are fixed in position by gluing. Note that as the backs of the panels are exposed they should also be painted.

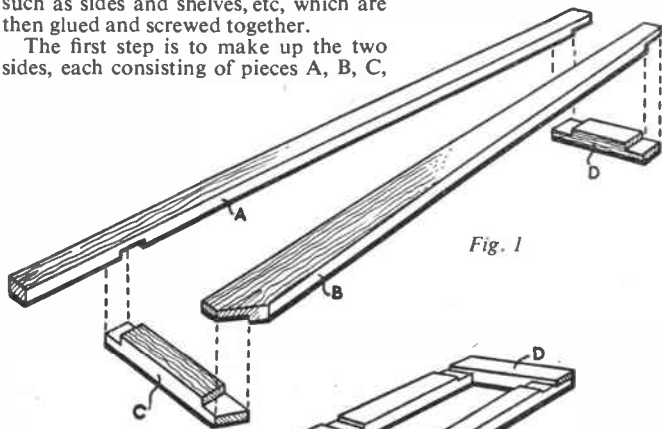


Fig. 1

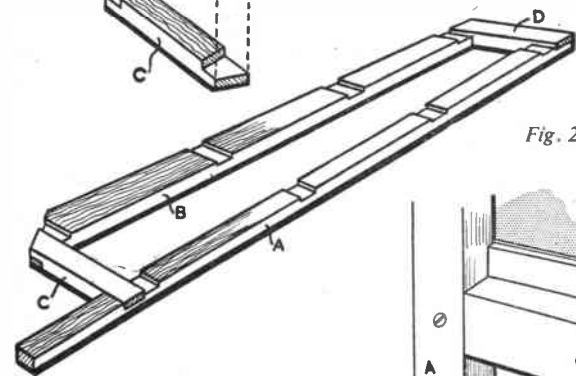


Fig. 2

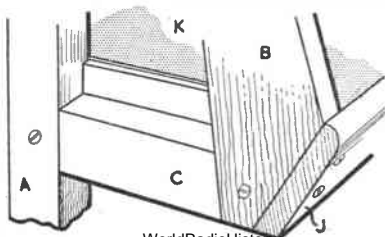


Fig. 3

CHEMISTRY

AT HOME

FURFURALDEHYDE gives a splendid colouration with aniline salts. Dissolve a drop or two of furfuraldehyde in water by shaking the two together in a test tube. In a separate test tube, mix a drop of strong acetic acid with ten drops of water and dissolve in this one drop of aniline, thereby forming a solution of aniline acetate.

Bring a drop of the aniline solution on to a slip of filter paper and add a drop of the furfuraldehyde solution. An intense magenta colour appears. By its very intensity of hue the test can be made extremely delicate. When both solutions are highly diluted a red or pink colour still appears.

mixing the two you can produce 'rasp-berry juice'.

This reaction will also serve to detect carbohydrates such as cellulose (cotton, paper), sugars, and starch. When these are carefully heated furfuraldehyde is formed. Put a very little cotton, paper,

SOME INTERESTING SPECIAL TESTS—2

starch or sugar in a small crucible. Support the crucible on a pipe-clay triangle and cover it with a small disc of filter paper previously moistened with a drop of aniline acetate solution (Fig. 2).

You will need a very small flame to heat the crucible. With a bunsen burner, of course, one need only turn down the gas. In the case of a spirit lamp push down the wick until only a little is showing; this will then give a tiny flame. On gently heating the bottom of the crucible for a short while a red fleck appears on the filter paper. Even a short thread of cotton or traces of the other substances will give a reaction.

Starch has its own special test. With iodine it yields an intense blue colour when the starch has been heated with water and cooled. With solid starch a dull purple colour is formed.

Mix a small pinch of starch to a cream with a few c.c.'s of cold water. Pour this into 100 c.c. of boiling water, continue boiling for a few moments and then let the liquid cool. Pour some into a test tube and add a drop of iodine solution. An intense blue colour appears. Heat the liquid. The colour disappears. Let the liquid cool. The blue reappears. This appearance and disappearance can be repeated a number of times, but eventually the colouration weakens and finally fails to appear.

If iodine has been spilled on starched linen, the stain may give trouble in the washing by being incompletely removed. Add a little sodium thiosulphate ('hypo') solution to some starch solution which has been blued with iodine. The colour immediately disappears. This, then, is the way to treat an iodine stain — simply dab it with sodium thiosulphate solution, finally rinsing in plain water.

Two common acids which exist in fruits — tartaric and citric acids — look

alike and both taste sour, but their reactions are different. A simple test, requiring no reagents, is the action of heat. Heat a small pinch of each in separate test tubes. Tartaric acid chars and evolves a smell like burnt sugar. Citric acid also chars, but gives off acrid-smelling irritating vapours.

Chemical tests are many. Two striking ones are the relative actions on calcium chloride solution. Neutralize small quantities of strong solutions of each acid with ammonia and then boil to remove any excess of ammonia. Let both solutions cool. Add a little strong calcium chloride solution to each. Tartaric acid gives a white precipitate either at once or on standing awhile. There is no precipitate with citric acid, but try boiling the liquid. A white precipitate appears, which dissolves on cooling again, owing, of course, to the calcium citrate so produced being more soluble in cold water than in hot. Most water-soluble substances are more soluble hot than cold.

Citric acid exists in lemons and its presence may be proved by slightly diluting about 10 c.c. of lemon juice with water, filtering, neutralizing with

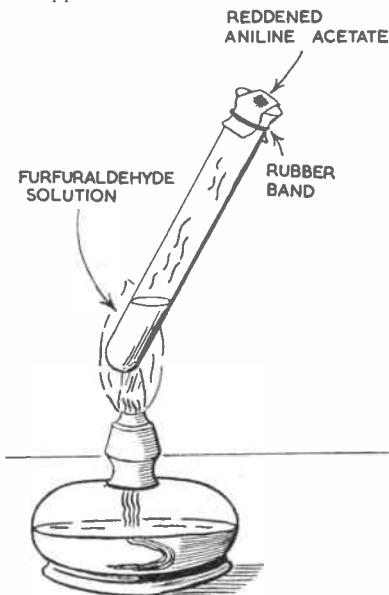


Fig. 1—Furfuraldehyde vapour reaction

Even the steam from boiling furfuraldehyde solution will react. Pour a little furfuraldehyde solution into a test tube and fix a strip of filter paper on the mouth of the tube, as shown in Fig. 1. Moisten the paper with a drop of the aniline acetate solution and heat the liquid in the test tube. The colouration readily appears on the paper.

This reaction can form the basis of a simple chemical conjuring trick to amuse a friend. Suitably dilute the two solutions. They will look like water. By

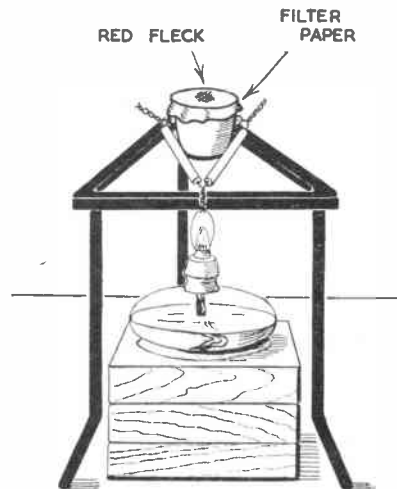


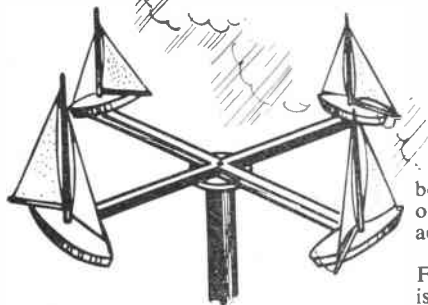
Fig. 2—Detecting carbohydrates by furfuraldehyde formation.

ammonia, boiling to remove any excess of ammonia and then adding calcium chloride solution to the cold liquid. No precipitate appears. Boil the solution, when the white calcium citrate is precipitated, redissolving on cooling.

It is interesting to compare the respective behaviours of tartaric and citric acids when they are submitted to the silver mirror test. Clean two test tubes by boiling a little sodium hydroxide solution in each and then wash out well with distilled water. Neutralize a little of

●Continued on page 333

A WIND-DRIVEN GARDEN NOVELTY



HERE is an unusual wind-driven novelty which can make an attractive feature in a garden. It is a squadron of four yachts which sail round and round whenever the wind blows, and their sails changing tack realistically at every turn. It can be mounted on a post or in some high position where it can catch the wind.

By A. Liston

The arms on which the yachts rotate are made from two 3 ft. lengths of wood, $\frac{1}{2}$ in. square. These are half-lapped in the centre and joined in the form of a cross (Fig. 1). A 6 in. circle or square of plywood is then screwed to the underside of the crossing to keep the arms rigid.

At this point a hole should be drilled through the centre of the arms and they should be screwed to an upright post, using a long screw and two washers. The arms should rotate freely but not wobble. After testing the mounting position, remove the arms so that the yachts can be fitted.

A suitable size for the hull of each yacht is 6 in. long and 2 in. wide, cut from $\frac{1}{2}$ in. thick wood. A $\frac{1}{4}$ in. hole is drilled through the middle of the hull to take the mast, and a similar hole is made in the end of each arm, so that the mast holds the hull to the arm when it is fixed in place.

The mast is a 9 in. length of $\frac{1}{4}$ in. dowelling, and the boom for the main sail is a 4 in. length of similar dowelling. A small hole is drilled in the mast, 1 in. above deck level, and a length of stiff wire threaded through it and formed into a loop at each side. A small metal eye is screwed to the top of the mast. The 4 in. length of dowelling, or boom, has a metal eye screwed to each end, and lastly, two metal eyes are screwed to the deck, one at the bow, and one at the stern.

The sails can be of thin cloth or plastic sheeting, such as plastic curtain material. The main sail is 7 in. high and 4 in. wide at the bottom. The smaller sail is 5 in. high and 2 $\frac{1}{2}$ in. wide at the bottom. Each corner of the sail should

be strengthened with an extra thickness of material securely fixed with waterproof adhesive.

The sails are attached as shown in Fig. 2, using fine string, and the boom is secured by its eye to the wire loop on the mast. It should swing freely. The

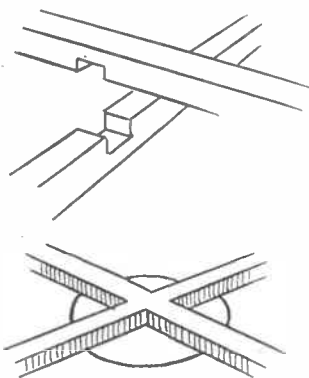


Fig. 1

rear end of the boom is secured to the eye in the deck with a short length of string, so that it can swing out about 3 in. on either side. The smaller sail should be fairly taut.

After the yachts have been assembled and fixed to their arms, they can be painted. The colour of the arms should contrast with that of the yachts.

To speed up or slow down the rate of rotation, the main sails can be hauled

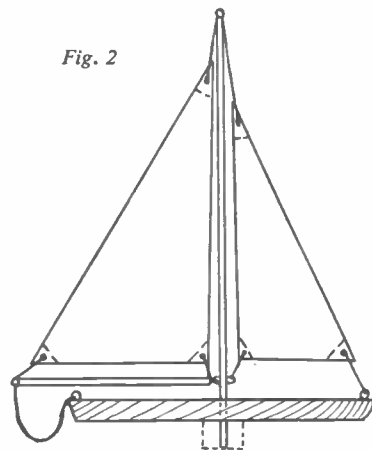


Fig. 2

tighter or allowed more play. Do this by altering the length of the string which runs from the boom to the stern on each yacht.

Continued from page 332

Interesting Chemistry Tests-2

each acid with potassium hydroxide solution, so as to produce solutions of the respective potassium salts.

To each add a little silver nitrate solution. Both give white precipitates of the silver salts. Pour off the supernatant liquid from each precipitate and dissolve them carefully in just enough ammonia by dropwise addition. Now stand the two test tubes in hot water. In the case of the tartrate, metallic silver is deposited on the walls of the tube as a bright silver mirror, provided your cleaning of the tube was thorough. Otherwise, the silver appears as a grey deposit. The citrate solution only darkens slightly and a silver mirror is produced only after a long time.

A colour reaction for tartaric acid is

afforded by Fenton's test. Neutralize a solution of tartaric acid with potassium hydroxide. To 5 c.c. of this add two drops of ferrous sulphate solution and then hydrogen peroxide dropwise until the liquid becomes very dark. On now adding excess of sodium hydroxide solution an intense violet colour develops.

A test which may be used to detect either tartaric acid or formaldehyde may be carried out by adding potassium hydroxide solution to tartaric acid solution until the liquid is alkaline. To some of this in a test tube add about half its volume of formaldehyde solution (formalin). Heat the mixture. A red precipitate of cuprous oxide appears.

(L.A.F.)

'Photographer' shows you how

Making Photo-Electric Meters

THE simplest photo-electric exposure meter consists of a selenium cell wired to a sensitive meter, as shown in Fig. 1. The cell generates a current depending on the light reaching it, and this produces a reading on the meter, which is calibrated in terms of exposure or light intensity.

When the meter is connected directly to the cell, the pointer may be carried right up to the full-scale mark, in bright light. To prevent this, a resistor can be added in series with the meter, as also shown in Fig. 1. This has most effect in reducing the pointer movement towards the full-scale position, but also makes the photometer a little less sensitive to dim light. To avoid this, a switch is often wired across the resistor, as shown. This is normally open for bright light readings. When it is closed, the resistor is shorted out, and the instrument then

reads dim light or interiors, etc. A spring-loaded switch which remains open unless pressed is best.

Photometer construction

A simple form of construction like that in Fig. 2 will allow the case to be made from thin wood, in the form of a shallow box. The cell is behind an opening at one end, being held by clips. The meter movement can be held with screws or clips, with small wooden blocks underneath if necessary. The top of the case, with window, can be screwed on last.

If the meter pointer tries to move backwards, leads to the cell or meter need to be reversed. The cells usually have a front conductive ring or band, which is negative, the metal back being

used separately, because they have a common magnet.

The photometer should be completely built before any attempt is made to calibrate it. Otherwise calibration may be upset by the edges of the cell being covered by the case or grating. Because the grating, if used, reduces the light reaching the cell, it must also be fitted before calibrating. With some photometers this grating is hinged, so that it can be swung away to expose the full surface of the cell, for dim light readings.

Calibration

If a ready-made photometer can be borrowed, the easiest and best method of calibrating the home-made meter is to direct both in turn at various evenly-lit objects, and mark the scale of the home-made meter to agree with the readings shown by the ready-made meter. If this is done carefully, the home-made meter

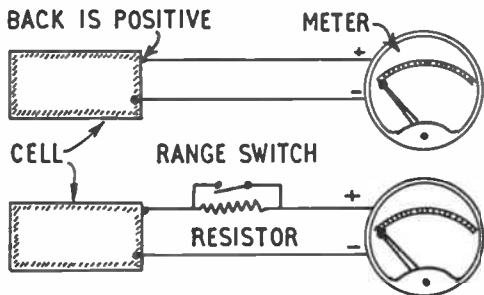


Fig. 1—Photo-electric meter circuits

reads dim light or interiors, etc. A spring-loaded switch which remains open unless pressed is best.

The sensitivity of the photometer depends on the size of the cell, and type of meter movement. For average purposes a 1 in. or 1½ in. diameter cell will be satisfactory, or a cell about 22 mm. by 40 mm., if the rectangular shape is more convenient.

The meter movement will usually be a surplus item from an electric radiator indicator, or various aircraft visual indicating devices. For good sensitivity, a 50 microamp or 100 microamp movement is best, but good readings can be obtained in reasonably bright light with less sensitive movements. A 1mA or similar type of meter is not sensitive enough, because the cell will not produce enough current. This will be clear if it is remembered that 100 microamps are only 1/10th of a milliamp.

With a 50 microamp meter, 22 mm. by 40 mm. cell, and 6.8K (6,800 ohm) resistor, readings will extend from about

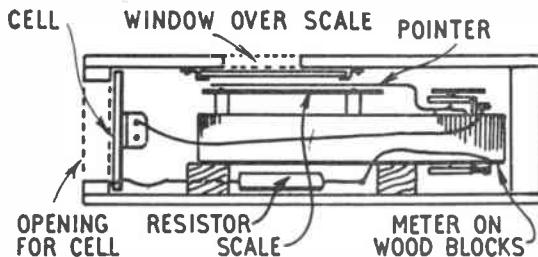


Fig. 2—Constructing a photometer

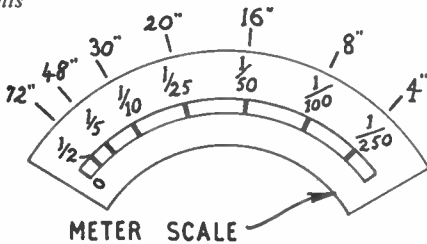


Fig. 3—Calibrating the meter from a lamp

positive, as in Fig. 1. A hinged flap may be arranged to fold over the cell, when not in use. A grating may also be fitted over the cell, to protect it, and cut down the angle over which light can reach the surface of the cell. This grating can be made by drilling holes, as close together as possible, in a piece of paxolin or ebonite about 1/8 in. thick.

Surplus meter movements vary in size, and this must be remembered if a small type is wanted. Some surplus instruments carry two complete movements, but sometimes these cannot be

will have an accuracy similar to that of the ready-made photometer.

If a calibrated meter is not available, reasonably accurate calibration is possible by noting the pointer positions with the photometer at measured distances from a 100 watt pearl lamp. This lamp should be without shade or reflector, and must be clear of walls or ceiling, which would reflect more light towards the meter.

At this stage it can be checked that the photometer covers a suitable range. If it is too sensitive, so that the pointer tends to move right across the scale, then the value of the resistor should be increased, or part of the cell covered. If the instrument is not sensitive enough, the resistor value needs to be reduced.

To calibrate with a lamp, the meter cell is pointed towards the lamp, and distances between lamp and cell measured. The meter scale can then be calibrated, as shown in Fig. 3.

At 72 in., the pointer deflection is marked for 1/2 second. At 48 in., the reading is 1/5th second, and so on, up to

1/250th second at a distance of 4 in. These markings are for 29° Sch. film, and an aperture of $f/5.6$.

The markings will not necessarily be spaced exactly as in Fig. 3, because this depends on the size of the cell, resistor, and meter movement. For example, if the movement is not very sensitive, the $\frac{1}{2}$, $\frac{1}{5}$, and $\frac{1}{10}$ second markings will be crowded closer together near the zero mark. When the cell is covered, the pointer should indicate zero. If not, the zero adjuster lever or screw of the movement should be turned carefully to correct this.

A scale like that in Fig. 3 is very easy to use, because the pointer at once shows the shutter speed. The photographer will also remember that the aperture can be modified if the shutter speed is adjusted as well. For example, if the meter shows 1/100th second at $f/5.6$, then 1/50th at $f/8$, or 1/25th at $f/11$, would be the same in terms of exposure.

Very often, however, some type of calculator is used with the meter, to show exposures for any aperture or film speed. An exposure indicator of this kind is shown in Fig. 4. This consists of two discs, pivoted together at the centre. The larger disc is marked with numbers from 1 to 7, and exposures from 1/1,000th second to 32 seconds. The smaller disc, free to turn independently, is marked with apertures from $f/2$ to $f/32$, and Scheiner film speeds.

This indicator is so arranged that the numbers 1 to 7 correspond with the seven speeds in Fig. 3. The photometer scale

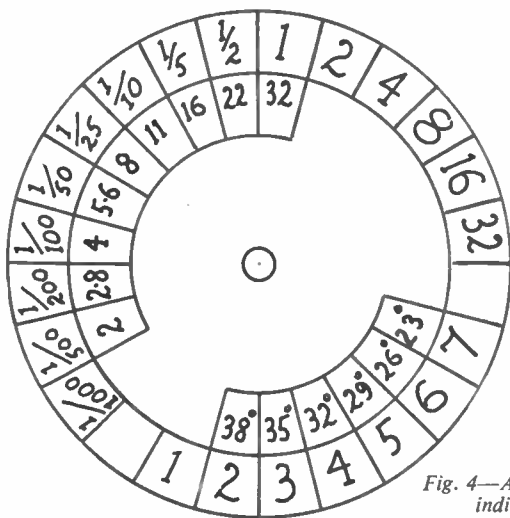


Fig. 4—An exposure indicator

can thus be marked 1 in the $\frac{1}{2}$ second position, 2 in the 1/5th second position, and so on, right up to 7 in the 1/250th second position. The shutter speeds are no longer marked on the scale, which is now only numbered from 1 to 7.

The exposure for any film speed and aperture can now be found. For example, if the meter pointer indicates 4, and a 32° Sch. film is used, the discs would be as in Fig. 4. Exposures can now be read off against shutter speeds — 1/50th at $f/5.6$, 1/25th at $f/8$, and so on. The

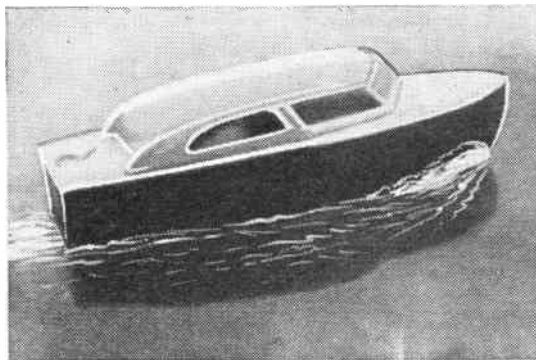
choice of the most suitable combination will depend on the subject being taken, in the usual way, or on the apertures and speeds with which the camera is fitted. For example, if a group were being taken, 1/50th at $f/5.6$ or 1/25th at $f/8$ would do well. But if there were fairly rapid movement, 1/100th at $f/4$ would be better. On the other hand, if an architectural or still subject were to be photographed, and considerable depth of focus were needed, then 1 second at $f/32$ would be better.

Photo-mounting Paste

AS many readers of *Hobbies Weekly* must have discovered, gum is not the most satisfactory substance to use for mounting photographs in an album, nor is it particularly good for sticking newspaper cuttings in a book. Here, however, is a really splendid adhesive paste which you can easily make at home at a very small cost. Also, it doesn't dry up, but remains 'good' for ages if kept in a jar with a tight-fitting lid.

Swell $\frac{1}{2}$ oz. of gelatine in a pint of water and when the swelling is completed dissolve the gelatine in the water by heating. Mix 2 oz. of arrowroot with sufficient water to make a thin cream, stir the two lots together and boil gently for five minutes. When thoroughly cold, mix in 2 oz. of methylated spirits, stirring vigorously. Finally, add 3 or 4 drops of oil of cloves and your home-made paste is ready for use.

Pour into a jar labelled 'Photographic Mountant' and remember to fit a lid that will exclude the air. (M.H.G.)



Praise for a speedy 'Squib'

WE were very pleased to learn of the success which Philip Lacey of Gothic Cottage, Parliament St., Crediton, Devon, had with his model of *Hobbies* 'Squib', a 12 in. balsa cabin launch, which is propelled by a Mighty Midget electric motor.

Philip who is only 12 years old, has raced it with World Electric launch,

which cost nearly twice as much, and the 'Squib' went nearly twice as fast.

For his model, Philip was awarded 3rd Prize in a Handicrafts Exhibition. He says 'The model is very easy to build; it must be, because it is only the fifth thing I have made with the fretsaw'.

Kit No. 3310 for making 'Squib' costs 29/6 (post 1/6 extra), and includes balsa, motor, and propeller, etc.

Attractive Marquetry Bowls

WOODTURNING has become very popular in recent years; so has marquetry. A combination of the two crafts produces an example of turnery which is very attractive.

First of all, using a fretsaw, make up a marquetry picture according to Hobbies fretsaw inlay instructions.* That is, several layers of $\frac{1}{8}$ in. wood are sandwiched together and the parts of

By D. McGhee

the design cut out with a fretsaw. After cutting, the pieces may be arranged like a jigsaw puzzle to form as many pictures as there are layers of wood (Fig. 1).

Each picture is now used as a horizontal lamination for a woodturning project (Fig. 2). The whole assembly is cut to circular form ready for turning (Fig. 3).

Mount the disc on the face plate of the lathe and turn it to the required shape. One word of warning — if you cut too deep when hollowing out the bowl, the picture will be lost. You will, however, be able to turn out a small bowl minus picture.

To avoid losing the picture, turn as much of the bowl as possible, leaving the picture covered with about $\frac{1}{8}$ in. of waste wood (Fig. 4). Glasspaper the

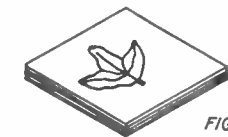


FIG. 1



FIG. 2.

GLUE UNDER PRESSURE

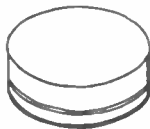
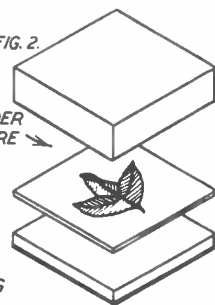


FIG. 3.

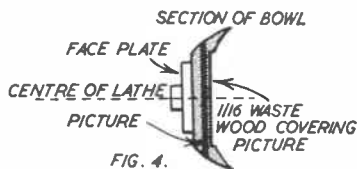


FIG. 4.

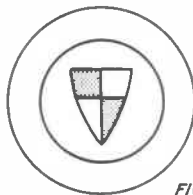
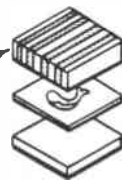
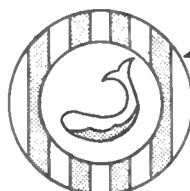


FIG. 5



bowl; then, very lightly, with a sharp tool, cut down to the picture. Glasspaper the picture carefully, and this will help to close any saw kerf made by the fretsaw.

Seal the wood with two coats of white french polish, then burnish with wax and steel wool as usual.

Fig. 5 shows some designs suitable for

this kind of work, which can also, of course, be worked in knife marquetry.

*A free leaflet, 'Making Pictures in Wood', obtainable from the Editor, Hobbies Weekly, Dereham, Norfolk, fully explains fretsaw inlay and how to obtain several pictures with one cutting. Please enclose stamp for return postage.

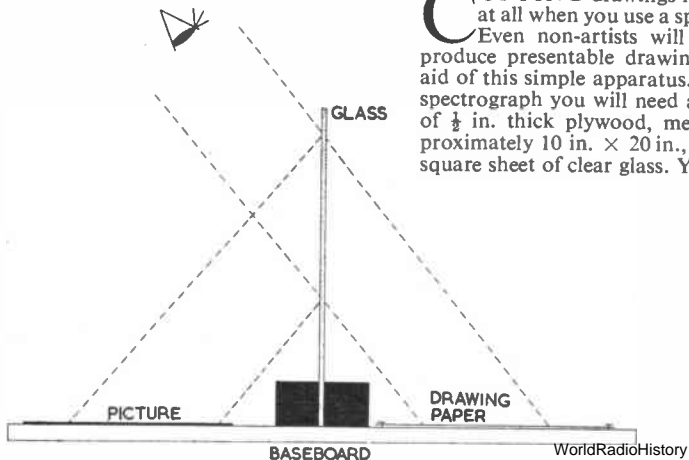
Easy drawing with a Spectrograph

COPYING drawings is no trouble at all when you use a spectrograph. Even non-artists will be able to produce presentable drawings with the aid of this simple apparatus. To make a spectrograph you will need a baseboard of $\frac{1}{2}$ in. thick plywood, measuring approximately 10 in. x 20 in., and a 10 in. square sheet of clear glass. You will also

require two 10 in. lengths of 1 in. x 1 in. batten and half a dozen nails.

Mount the pane of glass vertically upright across the middle of the baseboard, by nailing down the battens to provide a slot into which the glass can be tightly inserted. The spectrograph is now complete, and it only remains to paint the bare wood attractively.

The spectrograph is easy to use. Place the picture to be copied upon the left side. If you now look through the glass, from the left side, you will see a laterally inverted reflection of the picture, apparently actually upon the drawing paper. To copy the picture, you will merely have to trace around the 'ghost' picture with a pencil. Hold the picture and drawing paper in place by means of small pieces of Sellotape, as thumb tacks would damage the flat surface of the baseboard. (A.E.W.)



For cold weather

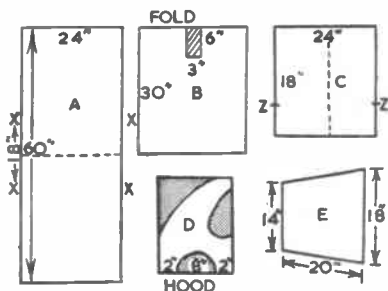
MAKE AN ESKIMO TIMIAC

WHAT keeps you warm is not so much your woolly shirts and blankets as the air which is mixed up with the material. That is why fluffy blankets keep you warmer than closely-woven ones.

The Eskimo makes use of this knowledge and uses the air instead of underwear to keep himself warm. This is the whole principle of the timiac. It is a loosely-fitting garment and has draw-strings round the face, wrists and waist, so that it soon becomes filled with a layer of nice warm air, inside which the Eskimo is quite happy, even though the thermometer may be at 30° below zero and a north wind blowing.

It is an admirable garment for winter days when you go tobogganing or snow balling. And it makes a fine camp garment to slip on after tea when it begins to get a bit chilly. It is also useful for boating and cruising. Made in a light waterproof material it will keep off rain, wind and sun, and when stuffed makes a fine camp pillow.

An army blanket contains enough material to make two timiacs. One can be obtained at a second-hand or surplus



store dealing in Government surplus stock. Or many newspapers advertise them for sale by mail order at about 12s. 6d.

The way to make it is as follows: fold the blanket lengthways. Cut off a piece 2 ft. wide from the folded end (diagram A). This gives you a piece of material 5 ft. long by 2 ft. wide. Fold it across the middle, and in the centre of the fold cut out a small piece 6 in. deep and 3 in. wide (B).

Next cut out the sleeves, which are two pieces of cloth, with measurements shown at E. Stitch them on at X-X (dia-

gram A) but do not sew up the sides or the seams of the sleeves. Leave that till last.

Make the hood from a piece of cloth 24 in. by 18 in. (C). Fold at the dotted line and stitch up about 6 in. at Z-Z. Then try it on inside out. Next cut out two pieces of cloth from the bottom of the hood, shaped as at D, allowing 2 in. at either side. This is so shaped as to fit the shoulders. The remaining shaded portions shown at D are parts to be cut away after the hood has been adjusted to suit the shape of your head and the size of your face. Now tack the hood and body together.

Sew it all together, arranging for a hem round the face opening to take a draw-string. Also provide draw-strings around the wrists. Finally sew up the sides and the sleeves in one continuous seam, taking care that you get a good joint under the arms.

Now turn the garment right side out and the job is done. There is no need for a draw-string round the waist if you wear a belt outside.

Two people working together can make one of these timiacs an hour. (M.B.)

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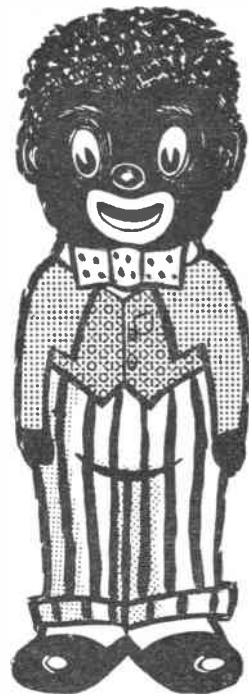
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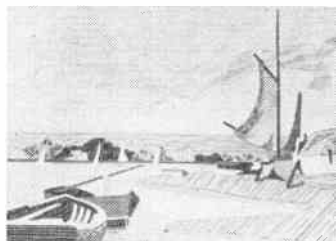


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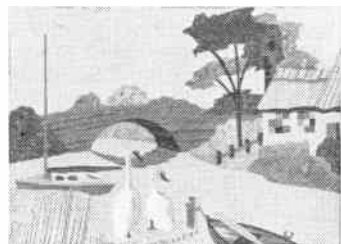


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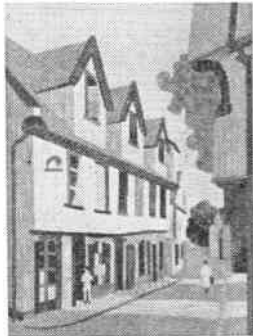


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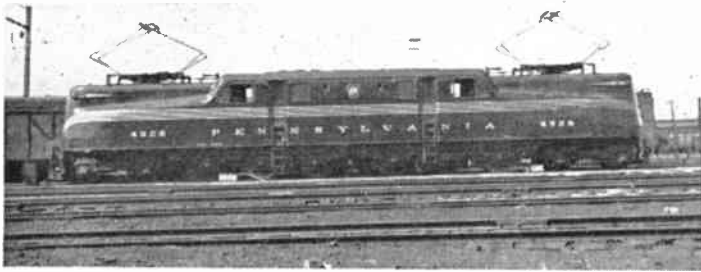
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The wheel arrangement is 4-6-6-4 or type 2-Co-Co-2, driving wheel diameter is 57 in., coupled length 79 ft. 6 in. and weight on driving wheels 303,000 lb. The engines have a starting tractive force of 70,700 lb., and weigh in full working order 477,000 lb. (205 tons). Other details: 11,000V. A.C. and 4,620 h.p. With its 4,200 locomotives, the Pennsylvania Railroad is America's largest operator of steam, diesel-electric and electric motive power and operates over 26,000 miles of trackage. (A.J.R.)

PEEPS AT NATURE

The common House Spider

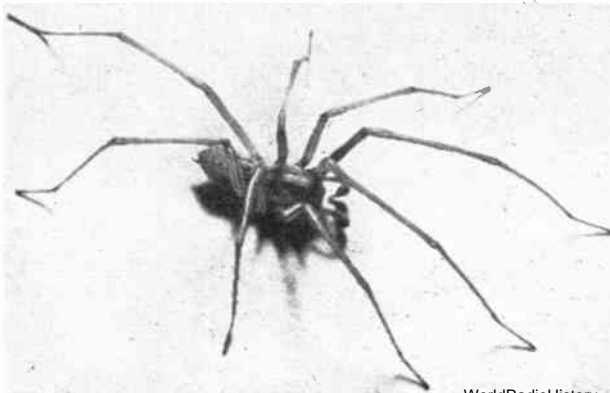
THE large spider so often seen running across the floor is not a 'lost' garden spider, but the House Spider.

Spiders, which belong to the class of Arachnida, differ from insects in possessing eight legs instead of six.

The house spider does not build the beautiful web of her garden relative, but is responsible for 'cobwebs'. The cobweb may be anything from a straggly mass of strands, which are repaired when broken

(the garden spider rarely repairs a web but starts again). This network of thread is usually constructed in out of the way places, such as behind pictures and bookcases, and serves to catch a sufficient number of flies and other insects upon which the spider feeds.

Like most spiders, the female is larger and stronger than the male, and his attentions are fraught with considerable danger, since she is not beyond a little cannibalism! (P.R.C.)

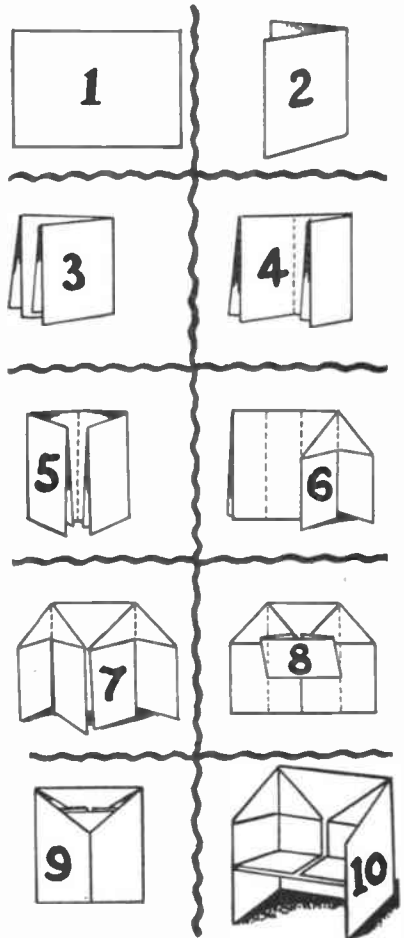


WorldRadioHistory

A PAPER CHAIR

THIS paper chair can be made in a few moments. The seat can be marked as a keyboard and the chair then becomes a piano. The step-by-step construction is as follows —

1. Take a rectangular shaped piece of stiff paper.
2. Fold it exactly in half.
3. Place the folded edge on top, and then fold again into the centre line.
4. Open up the second fold. Fold the two opposite folded edges into the centre.
5. Press down the folds firmly.
6. Press open one of the top edges of the folds and press folds firmly.
7. Repeat on opposite fold.
8. Turn up the centre flap to form seat.
9. Fold over the outside two triangular-topped folds and press all edges down very firmly.
10. Open up to get finished chair shape. (E.C.)



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YEAST IN WINE MAKING

AMONG the thousands of enthusiastic producers of home-made wine there are very many who are doubtful about the use of yeast. Some believe that good wine cannot be made without adding it to the brew, while others consider it absolutely unnecessary and get all their wine to ferment perfectly without its use.

Actually there is no difference between the two methods, and wine made with yeast is just as good as that made without it. Added yeast will speed up the process, but the wine often tends to become clearer and of a better colour when the recipe does not contain yeast.

By A. F. Taylor

The bloom which we admire so much on the surface of grapes, plums, sloes, and damsons contains a certain amount of natural yeast, and these fruits will ferment much more readily than those less endowed with these properties.

Wine made from roots, herbs, and some flowers which do not contain this natural yeast must have it added in order to produce a suitable fermentation.

Temperature is very important for the proper fermentation of wine, and the ideal to aim at is 70°F. Provided this can be maintained fairly speedy natural fermentation will start in a few days. This is called spontaneous fermentation, and in most cases, especially with elderberries, may take up to a week before it starts.

When it is dry and also cold, yeast is quite inactive, and can be kept for some considerable time in this state. On the other hand, however, the yeast cells are killed by a high temperature, and this happens at about 140°F. and upwards.

From this we can see that in order to obtain the utmost from the natural yeast on the skins of the fruit, we must prepare the juice by the cold water method. We can, however, use warm water for soaking the fruit provided it never exceeds blood heat (98°F).

Hot or boiling water extracts the goodness from fruit much quicker than soaking in cold water, but this latter method is much to be preferred, because you get a more delicate flavour and scent to your wine.

It will, however, take much longer to produce wine by this method, and fermentation may perhaps continue for several months. The amount of spirit in the wine will be very low to start with, but increases quite appreciably, and

when fermentation ceases, and the wine matures, it may contain anything up to 20%.

The addition of yeast is made to some solutions to increase the amount of spirit in the wine, and not just to help it ferment, and in some cases this initial fermentation is very vigorous, causing a lot of froth. It does not last for long, and in most cases has slowed down considerably by the end of the first week, after which a much slower or secondary fermentation takes place.

The amount of pectin in the juice of the fruit appears to have a certain action in the production of froth, and fruits which have a high pectin content cause a large quantity to be made.

There are many different kinds of yeast now available for the production of home-made wine, but there are a lot of people who still favour the old bakers' yeast. There is one disadvantage, because it is important that it is used while still fresh. This difficulty can be overcome when it is not possible to get fresh yeast by using a dried form obtainable as small granules in 1 oz. packets (Allinson Dried Yeast).

In recipes when yeast is added the usual amount is 1 oz. to the gallon of liquid, but this quantity is halved if you are using the dried type. Yeast is best added to the brew while it is at blood heat (98°F). Put the yeast into half a cupful of the wine, let it stand about 15 minutes, stirring occasionally, and when it has frothed up, add it to the brew.

It can also be added by crumbling and sprinkling it over the wine or spreading on toast and floating on the top. This applies to bakers' yeast, but the dried type can be used in the same way after it has been dissolved in a little of the liquid.

While the wine is fermenting it should not come in contact with any kind of metal or enamel ware. Glass bottles and earthenware jars are the ideal containers for wine in the fermenting stage.

A good way to understand the two methods of wine making is to brew samples of both, and here are some recipes.

RAISIN WINE (with yeast)

2½ lb. raisins (chopped up)
1 oz. tea
1 lb. wheat
3 lemons (thinly sliced)
3½ lb. sugar
1 gallon water
1 oz. yeast

First make the tea by putting it in a muslin bag, and placing in boiling water, and leaving it until cold or nearly cold.

Now remove the bag, and add the wheat, sugar, raisins, and lemon slices.

The yeast is added by first mixing with a small quantity of the warmed liquid, mixed well, and then stirred in. Allow to ferment for about three weeks, stirring each day, after which it may be strained and bottled.

An alternative method using the same recipe is to allow the ingredients to soak for about a week, then the liquid is strained and the yeast added.

RAISIN WINE (without yeast)

This is a very simple recipe requiring few ingredients.

8 lb. large raisins
1 gall. water

Pick over the raisins, removing any stalks, and then chop them up. Add cold water, and place in a jar. Keep covered, and stir daily for two weeks, after which strain off the liquid and put in jar or bottles to work until all fermentation ceases. Rack off frequently until clear, then bottle off and cork tightly.

LEMON WINE (with yeast)

10 lemons
1 gall. water
4 lb. sugar
1 oz. yeast

Take five of the lemons, and remove the rind very thinly without any of the white pith. Dissolve the sugar in hot water, and pour over the rind. Allow to cool a little before adding the strained juice of the ten lemons and then the yeast, and let this stand in a covered jar for about two days. Strain this, and put in jar or bottles to ferment until it ceases; then cork down, and decant after a few months.

LEMON WINE (without yeast)

10 lemons
1 gall. water
3 lb. lump sugar

Peel five of the lemons very thinly, again without any pith, as this is very bitter and some people dislike it. Cut all the lemons in half, scoop out all the pulp, put this together with the rind into cold water, and allow to stand for five days. Stir and squeeze each day. Strain and add the sugar, and stir until dissolved. Place this into bottles, and allow to ferment until it ceases, when it can be corked up. This wine is fit to drink in from six to nine months.

Both raisin and lemon wine can be made at any time during the year when the fruit is available. Orange wine also can be made at any time, using the same recipes as for the lemon.

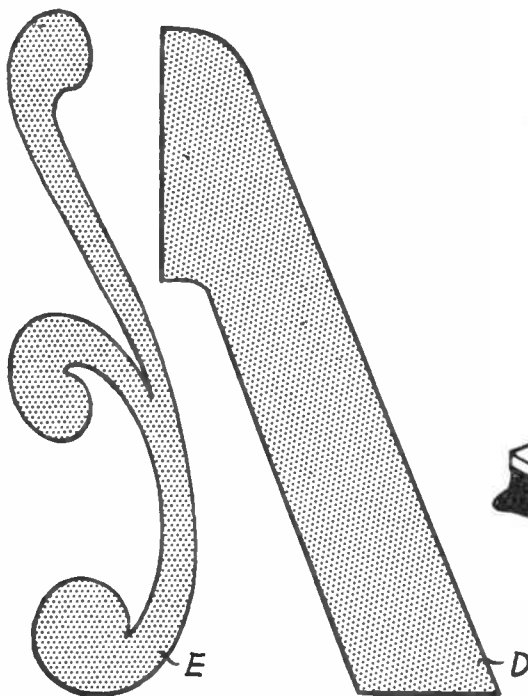
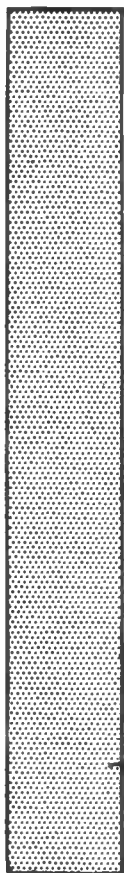
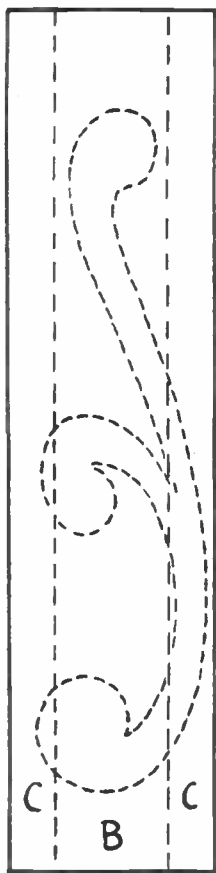
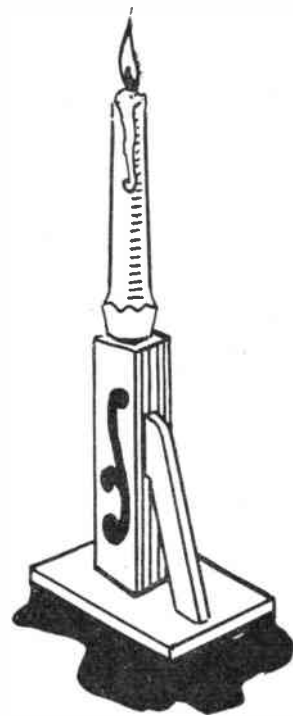
Ornamental Candlestick

TO BE CUT OUT WITH A FRESAW

USE your fretsaw to cut out the parts for this attractive candlestick. Cut one of A, two of B, two of C, and one of D from $\frac{1}{4}$ in. wood. Cut two of the overlay E from $\frac{1}{8}$ in. wood.

Clean up the pieces with glasspaper, and glue together, the sides C being glued between the sides B, as shown by the dotted lines. Clean up, and paint with high gloss enamel. Trim the base of the candle to fit in the top of the holder.

(M.p)





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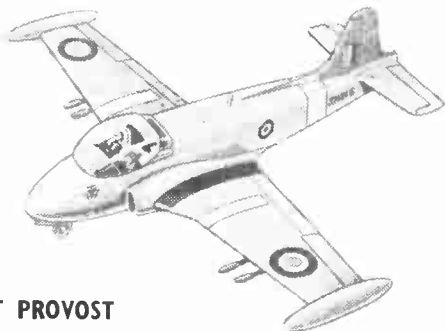
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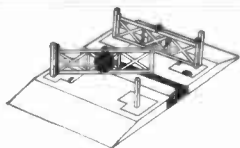
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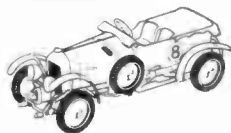
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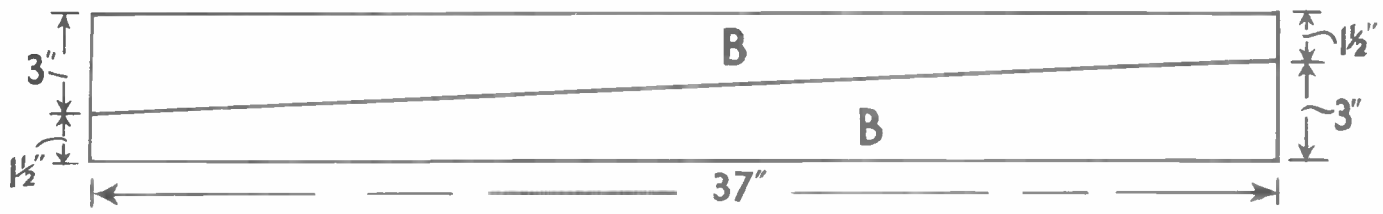
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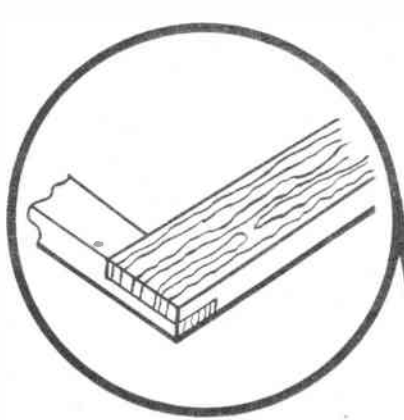
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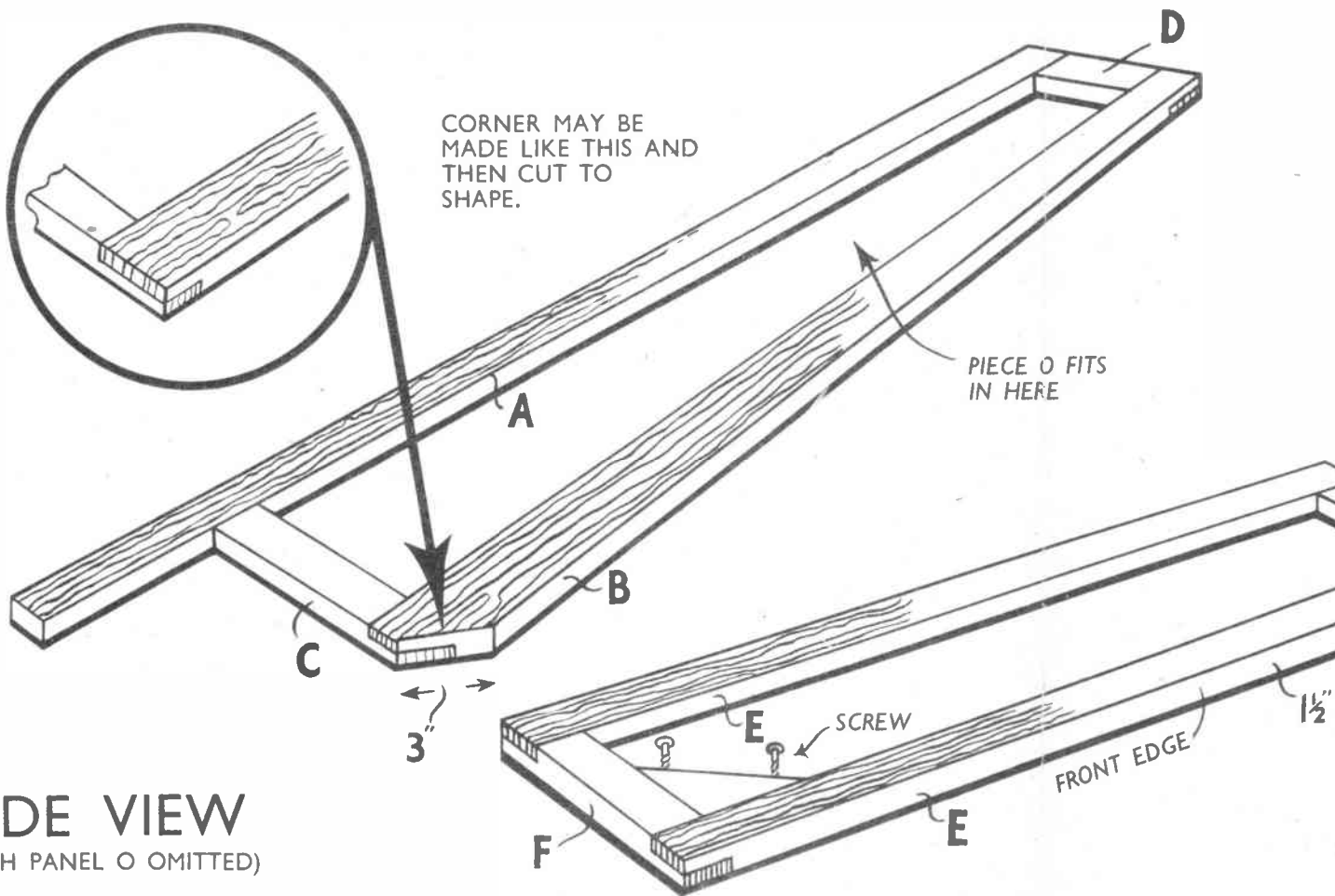
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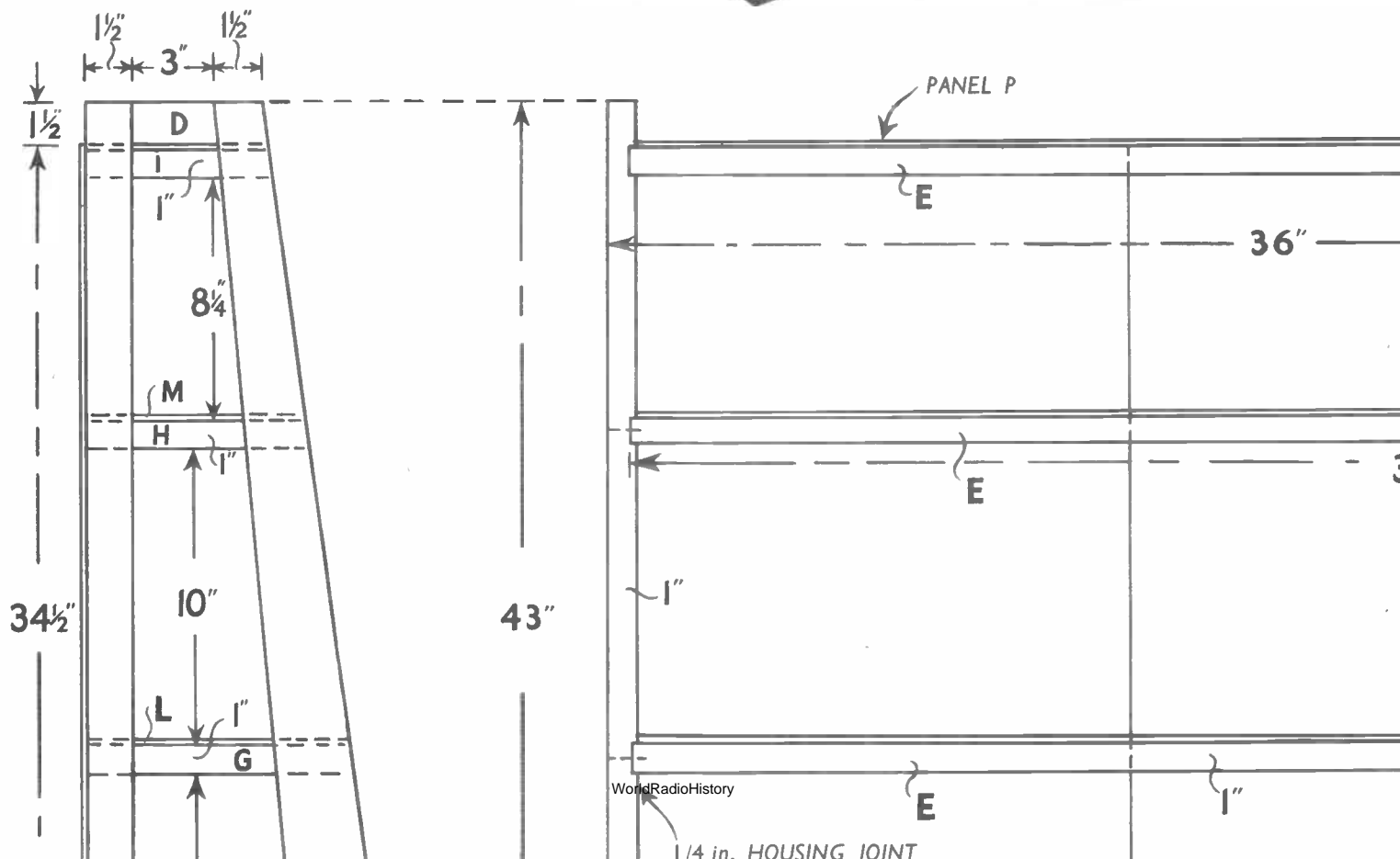
LAYOUT OF PIECES B ON THE WOOD.



CORNER MAY BE MADE LIKE THIS AND THEN CUT TO SHAPE.



SIDE VIEW
(WITH PANEL O OMITTED)

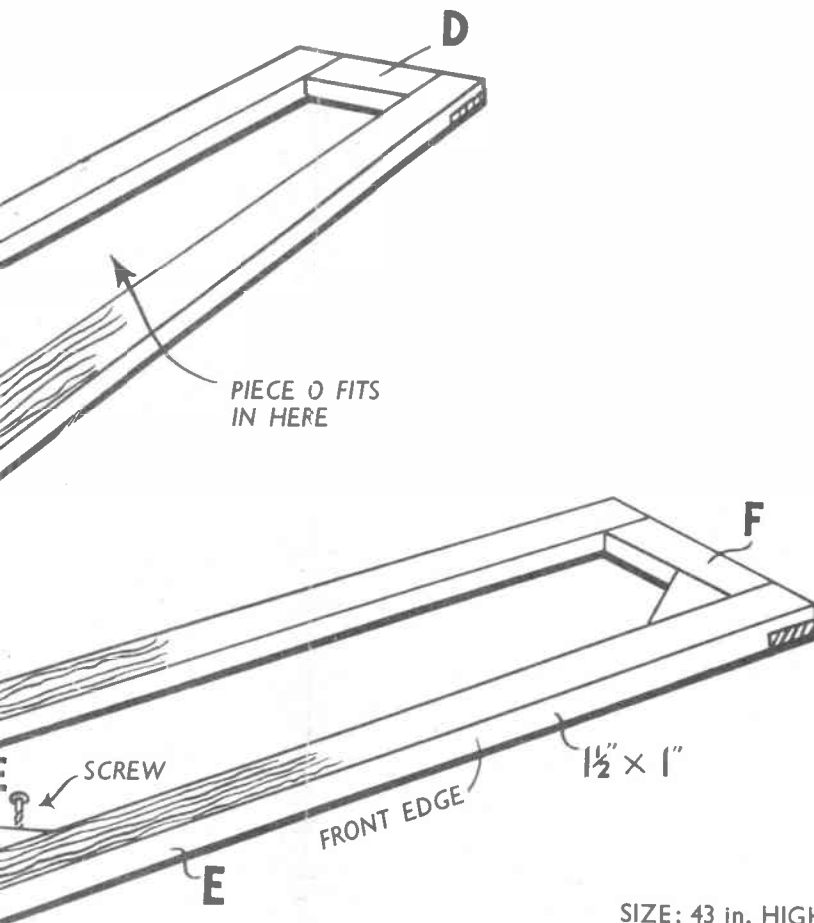
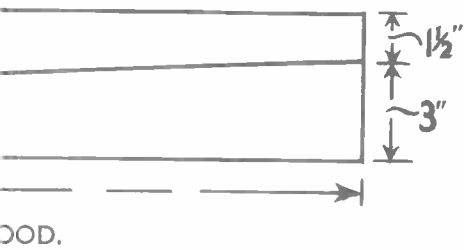
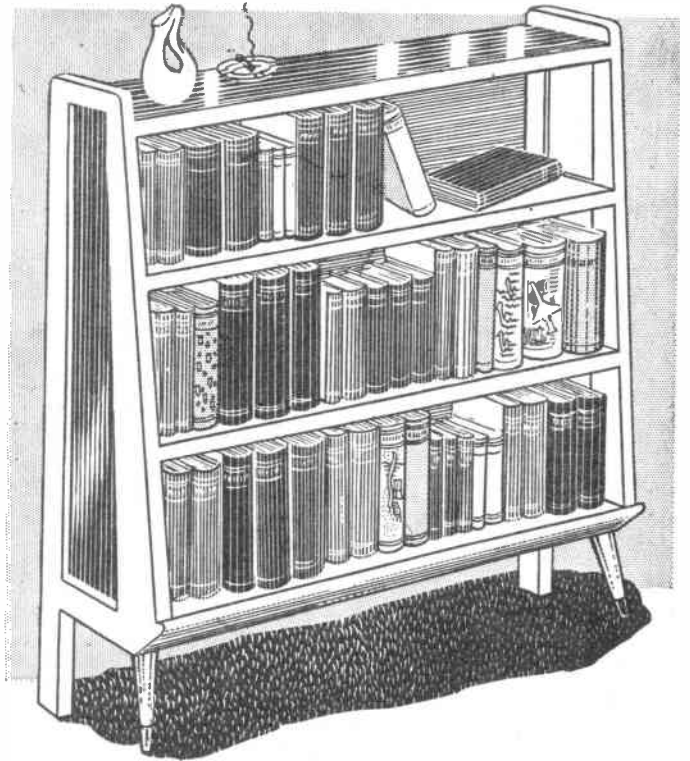




DESIGN

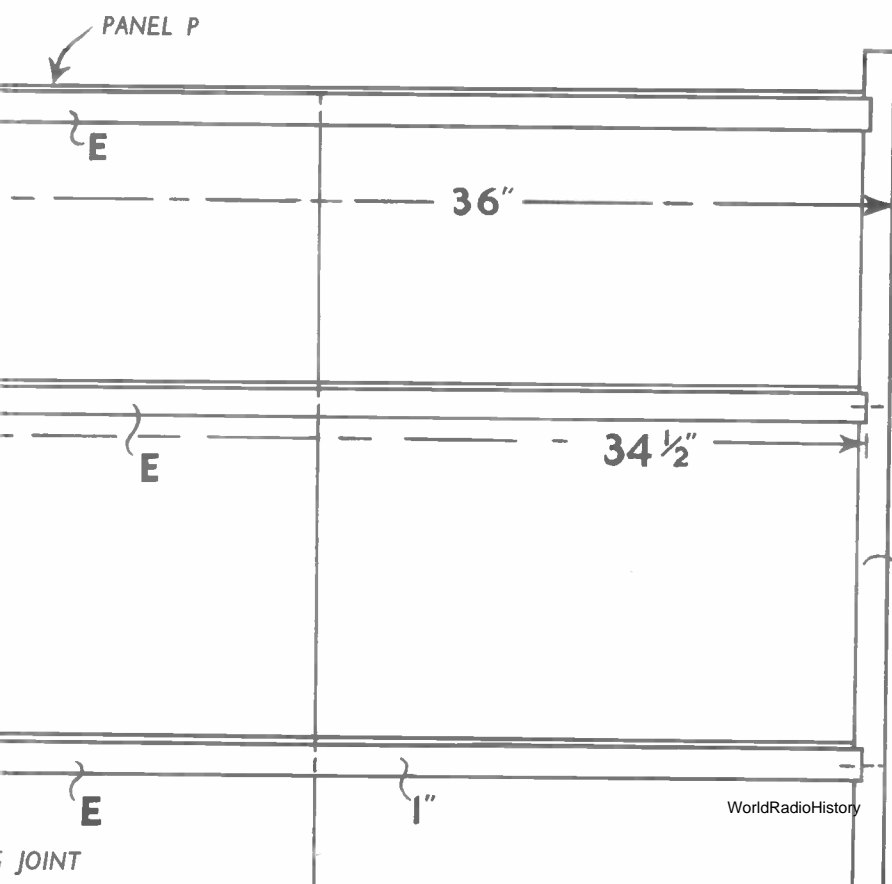
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CONTEMPORARY BOOKCASE



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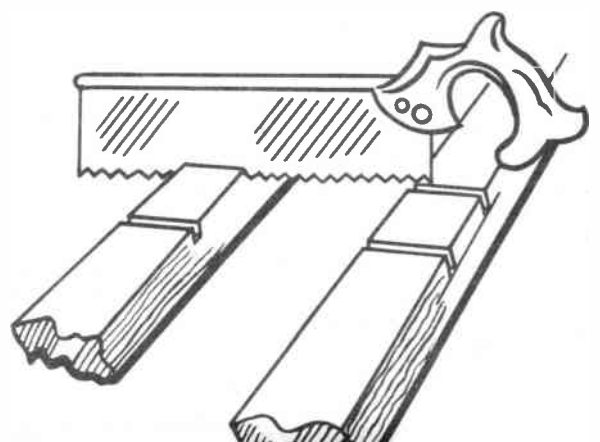


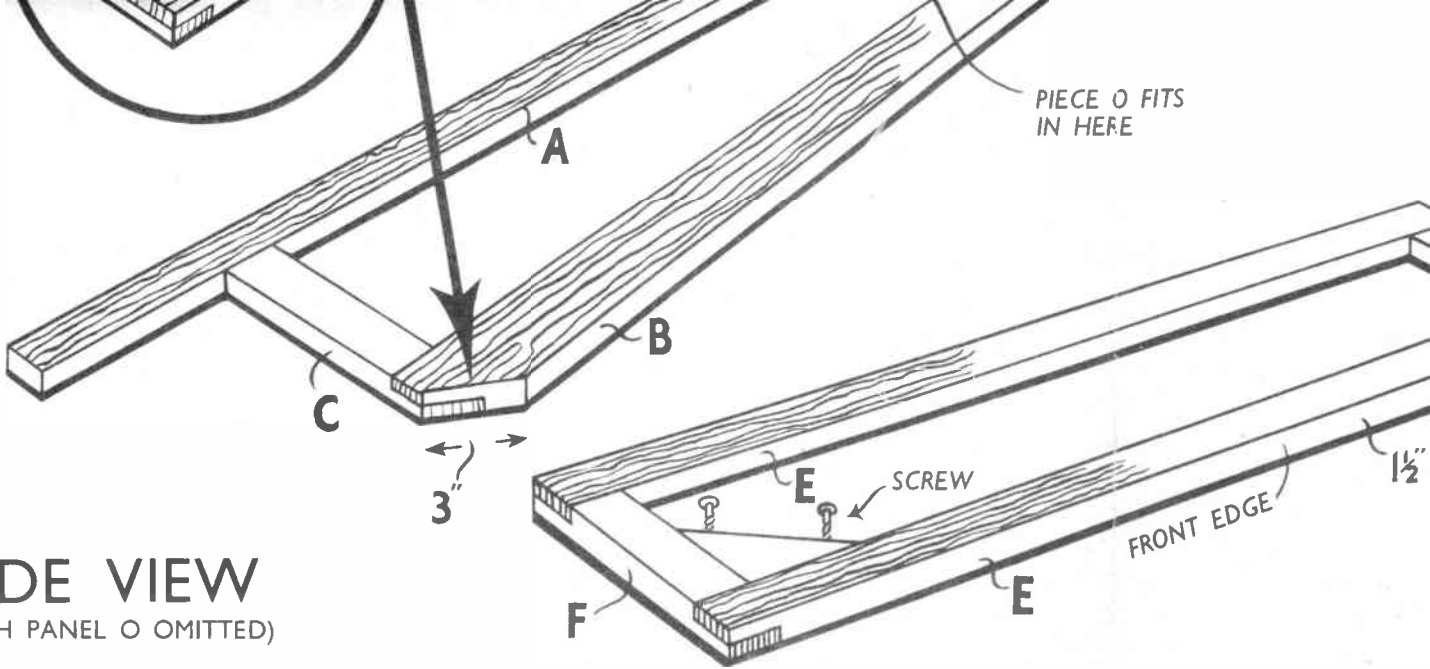
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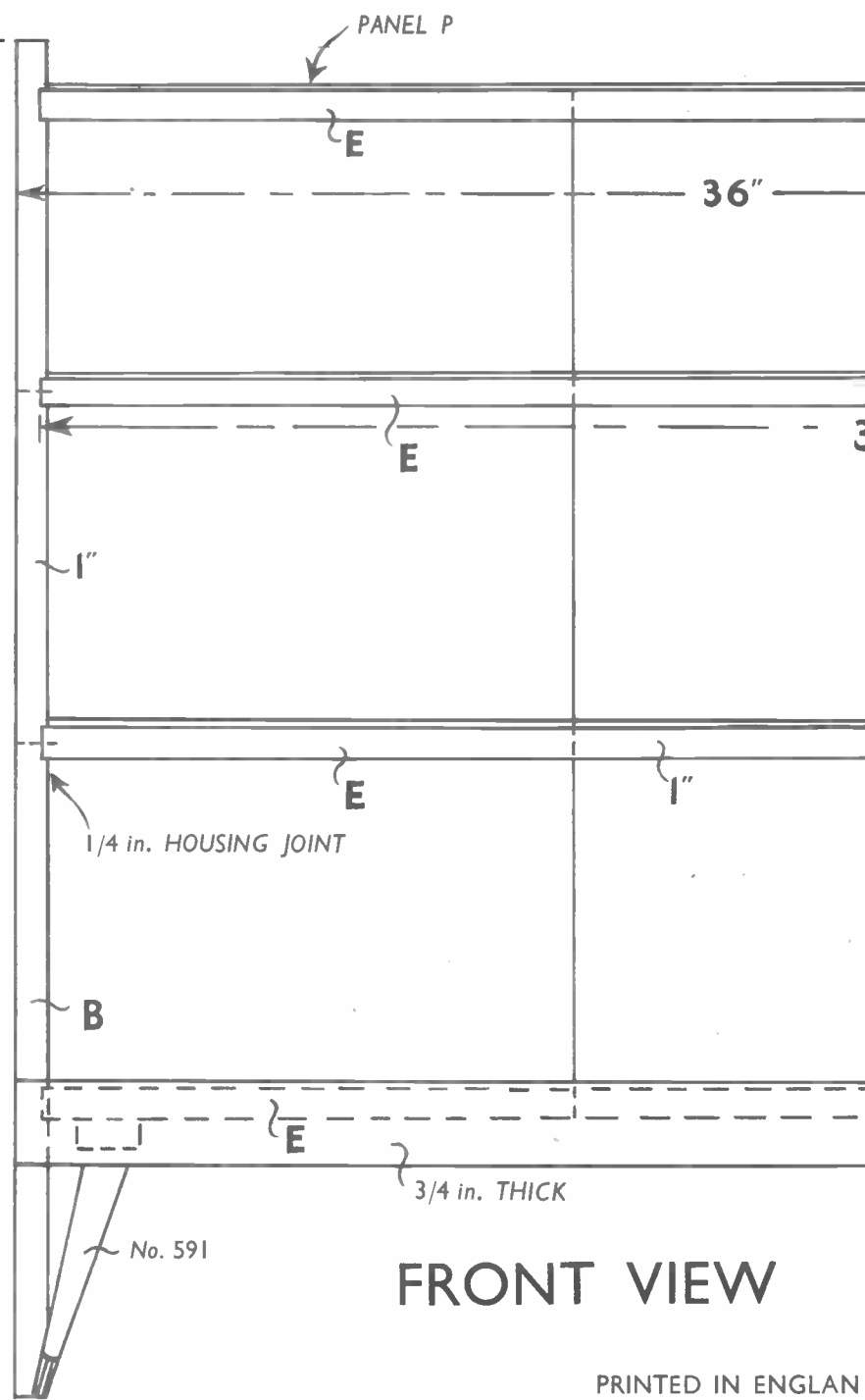
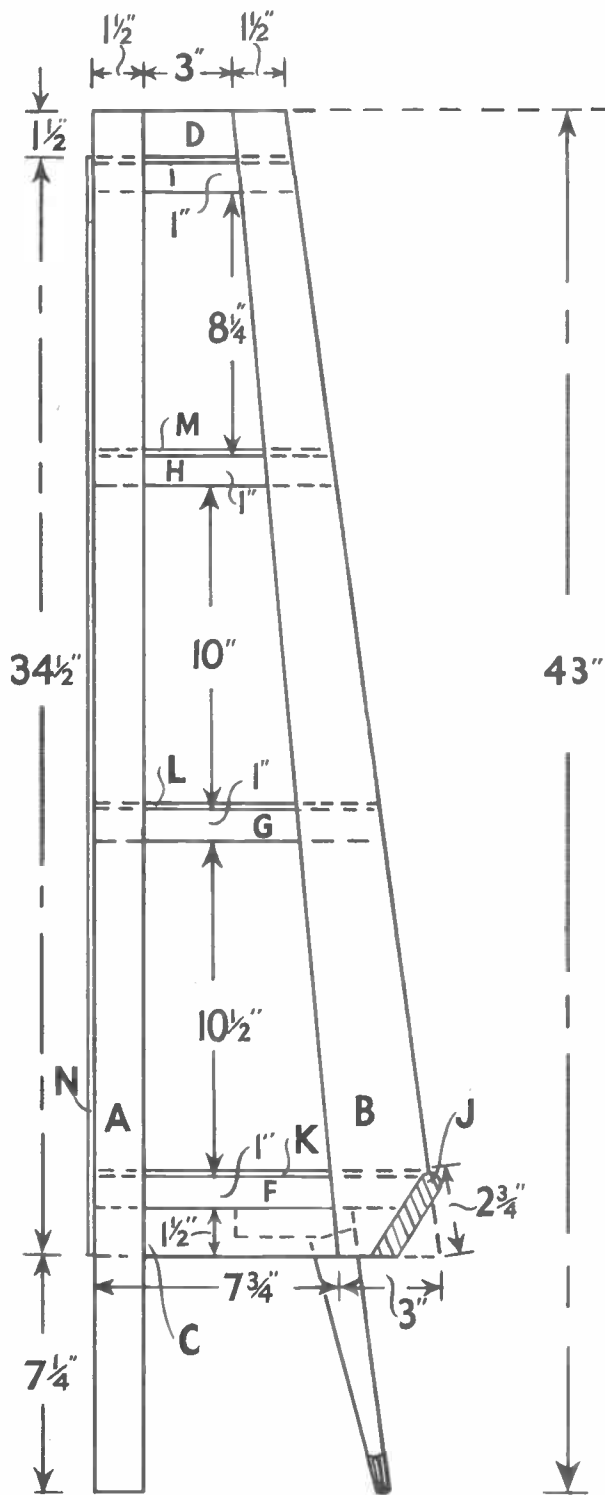
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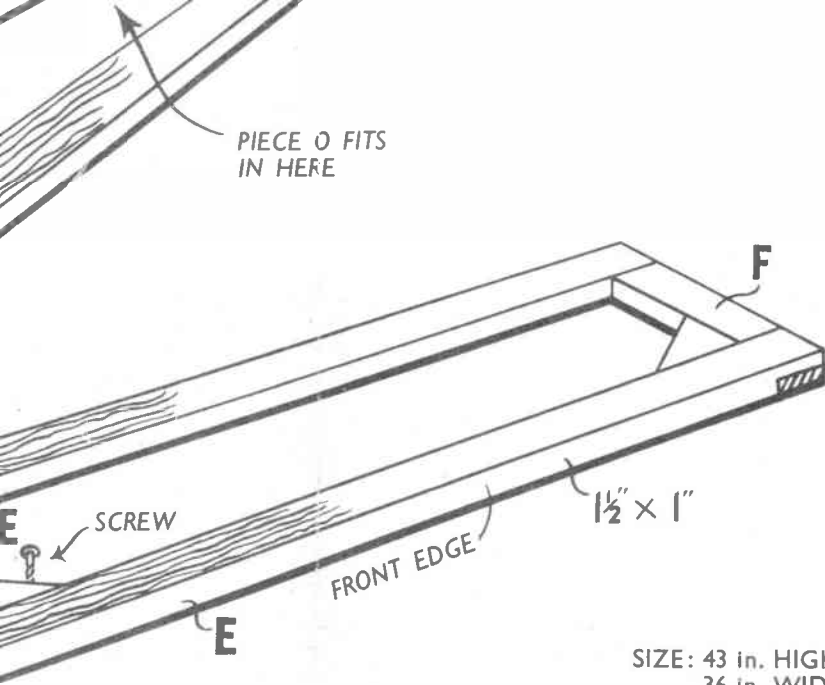




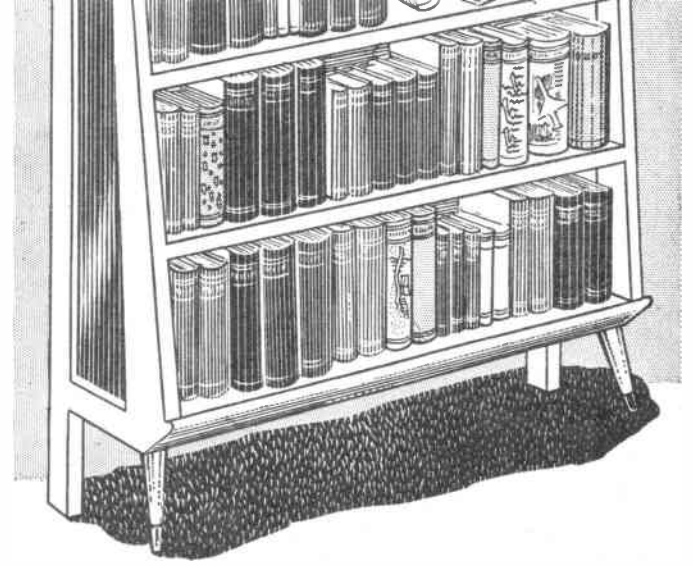
SIDE VIEW
(WITH PANEL O OMITTED)



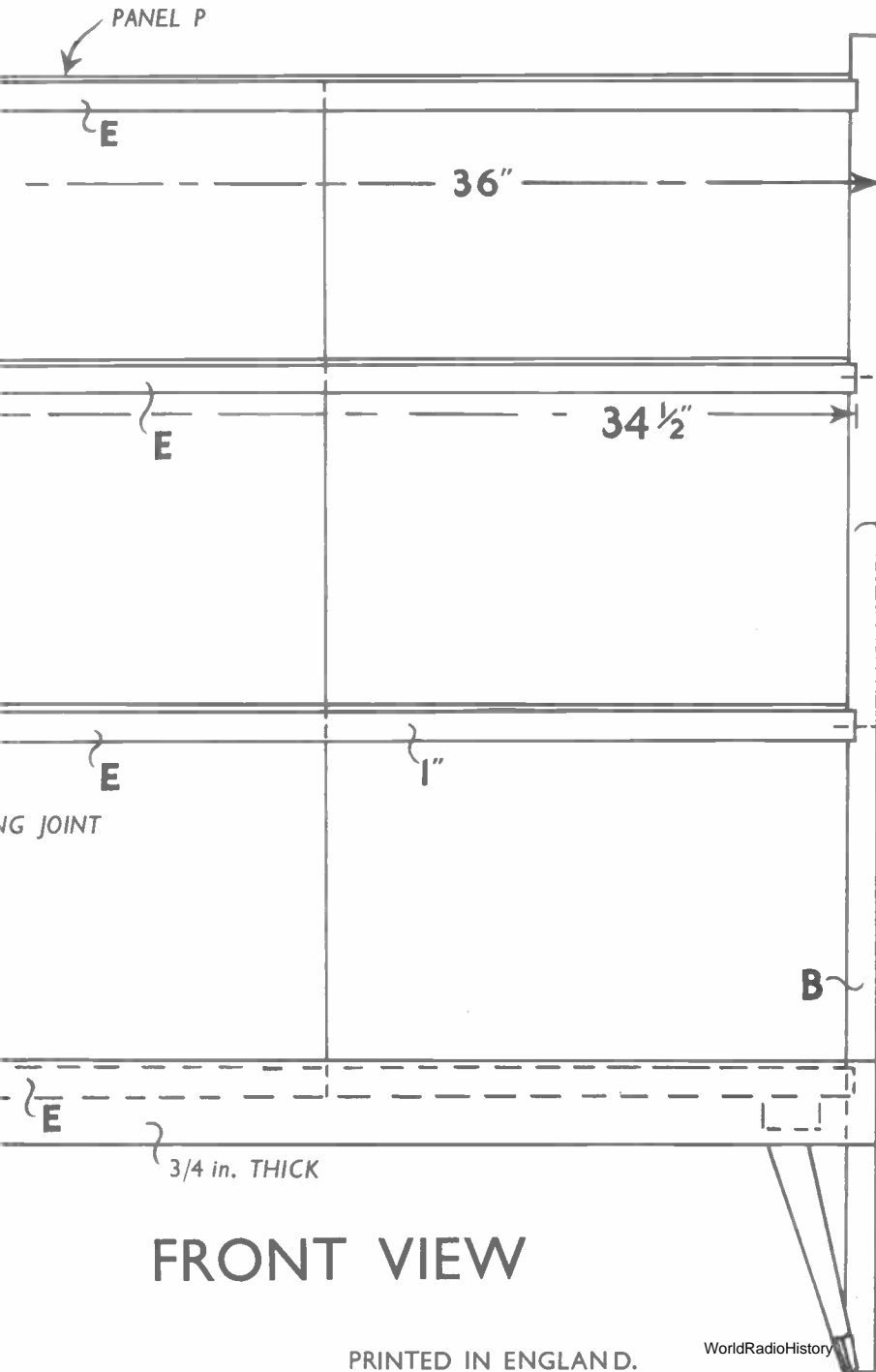
FRONT VIEW



SIZE: 43 in. HIGH
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11 in. DEEP



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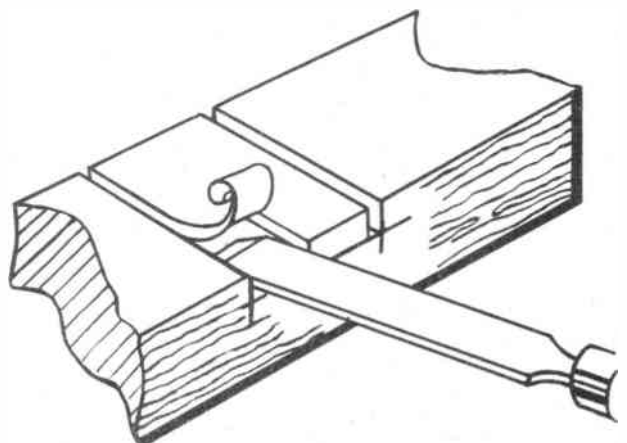
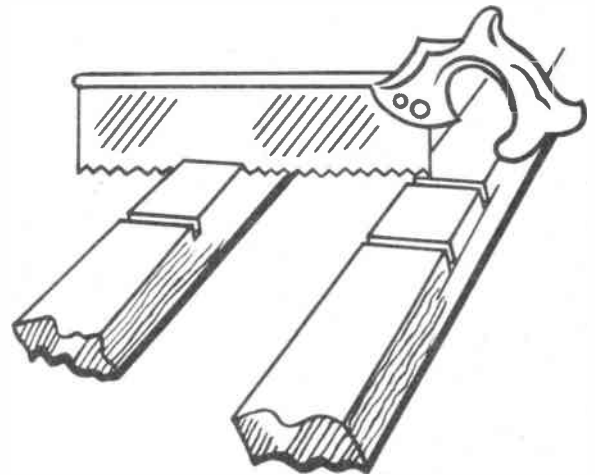
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GREEN thumb gardening has been a hobby for ages. It is always highly rewarding and fascinating. Whether the gardener elects to concentrate on roses, iris, dahlias, lilies, rock-gardening, or any of the many other specialities is of little concern as long as perfection and satisfaction is achieved.

In connection with plants and plant-life as a whole, there are a great many

collecting of wild material such as milk-weed pods, cat-tails, etc.

NOTES ON PLANTS

Then there is the fascinating game of delving into the origin of names, history and legends connected with plants.

Mistletoe has a most interesting past

Among some old constellations one was found named Robus in the Southern Hemisphere. Robus being an old English name for oak, it naturally aroused curiosity regarding the naming of this constellation. It took a great deal of research until old maps of the constellations of that time were located and the origin of the name was finally solved by history, when astronomer Halley named this constellation to honour an old oak tree which had saved his King's life by offering shelter during a battle.

'There is at least one tree which went to heaven!'

In the quest for the origin of names old or new, much can be learned by studying Indian lore. For instance, the common weed plantain was called 'White Man's Foot' by the Indian since it was brought from the Old Country and according to the Indians wherever the white man walked and left his foot-



related hobbies which can bring great satisfaction even though there is no place for a garden.

First of all there is the great outdoors. Since curiosity is one of the most important ingredients of any hobby, the explorations of the wide open spaces available to everyone becomes a living museum, each plant to be rediscovered by the hobbyist in search for knowledge. This does not only refer to the names of plants being found, but also to some of their most interesting characteristics.

Another interesting hobby pertains to indoor gardening and there again, may it be cacti, African violets, begonias, or mixed potted plants, a great deal of satisfaction is derived.

Another indoor garden project, not often seen is the terrarium. Here, even those with a flair for landscaping can really go to town with a miniature garden. Other hobbies may include photography of individual wild flowers or ferns, the drying of flowers to make herbarium, the sand-drying of flowers for later use in flower arrangements, the

and it may take years to find all the legends pertaining to it. The Christmas rose has a fascinating history both in religion and folk-lore. Here, for example, is a case in point.

prints, plantain was sure to appear.

Others who might be interested in research as a hobby could pursue plants used for medicinal purposes, economic plants such as spices, dyes, etc.

Third Time Lucky?

HERR H. J. NOWARRA of Berlin N.W. 87, Rostockerstr. 51, Germany, collects aircraft photos. In a recent letter he said:

'My first collection of photos was lost at the close of World War II. I had been a supply officer in the Luftwaffe and had the opportunity to build up one of the most outstanding collections of aircraft photos ever. My second collection was taken away by the Communists when Russian troops occupied Berlin.

'I had given up the idea of forming a third collection but I was forced to fly during the "Airlift". You cannot listen to the noise every few minutes of a Packet or Skymaster without getting bitten by the bug again, so I started

collecting again.

'To begin — first you must decide upon the type of plane — it is impossible to get all of them. I decided to collect all powered planes and cargo gliders. Military aircraft used in World Wars I and II are the most popular group.'

Mr Nowarra concludes his letter with these words:

'A timely warning to collectors — once you get together your first ten pictures, you will never be able to stop.'

Advice on this fascinating hobby may be had through the magazine. But you *must* send your enquiries to: The Editor, *Hobbies Weekly*, Dereham, Norfolk, and — most important — enclose a 3d. stamp and reply coupon.

Instructions for making

THE 'VILLAGE PUMP' PLANT HOLDER

HOUSE plants and cacti are shown off to good advantage in this 'Village Pump' container which is both novel and attractive. The wooden trough forms a receptacle for two or three $3\frac{1}{2}$ in. flower pots, and a variegated ivy looks most natural twining round the pump.

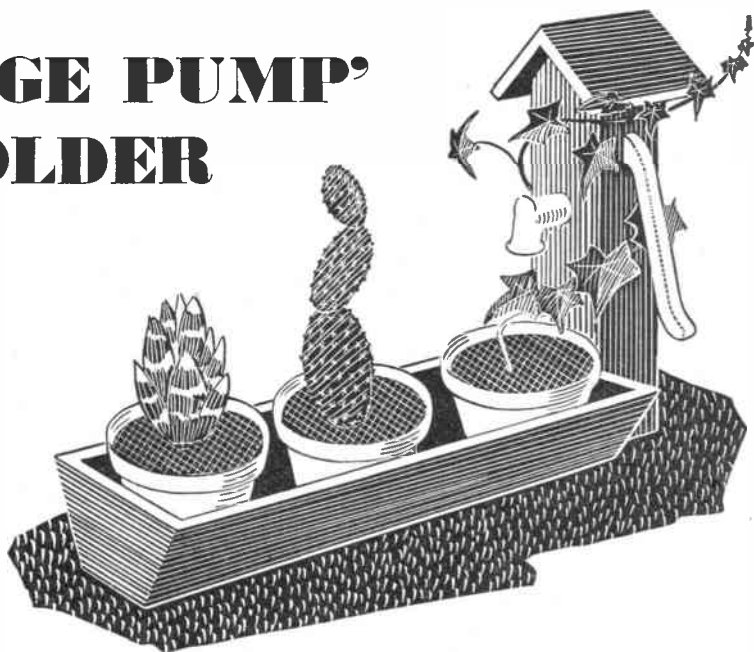
The diagrams in Figs. 1 and 2 show the various parts lettered with measurements to give an idea of the size of the finished container. Use $\frac{1}{4}$ in. wood throughout, and stick the pieces together with waterproof glue.

Start with the trough

Commence by making up the trough as indicated in Fig. 3. The base B is 3 in. wide and 13 in. long, and the ends C are 4 in. wide at the top and 3 in. wide at the bottom. Note that the base B and the sides A must be shaped to fit.

The pump is shown in Fig. 4, and is glued together with pieces E between pieces D. Pieces E are $1\frac{1}{2}$ in. wide, and are shaped at the top to take the roof slopes F, which are $2\frac{3}{4}$ in. wide and about $2\frac{1}{4}$ in. deep. Shape the roof slopes to fit, as indicated in Figs. 2 and 4.

The handle is cut from $\frac{1}{4}$ in. wood with a fretsaw, and is glued to piece D. Draw out the shape direct on to the wood. The spout is also drawn out, and cut to shape with a fretsaw. Two pieces of $\frac{1}{4}$ in. wood must be glued together to give the correct thickness, or alternatively it may be cut from an odd piece of $\frac{1}{2}$ in. wood. Shape with a modelling knife before gluing to piece E.



NOVEL CONTAINER FOR PLANTS

Clean up all parts with glasspaper, and paint the whole assembly with high gloss enamel. If desired the pump could be stained and varnished, but it will be found that a pale pastel shade of paint will give the best effect.

To water the plants they should be taken out and placed in a bowl with water just up to the rims of the pots. Allow to thoroughly soak, and then allow to drain before returning to the container. By this method the pots will not require watering so frequently. (M.h)

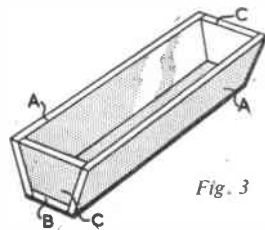


Fig. 3

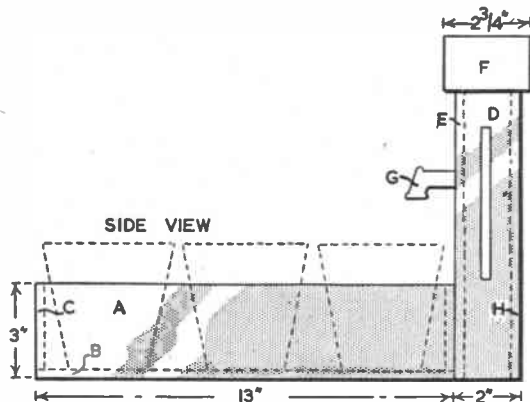


Fig. 1

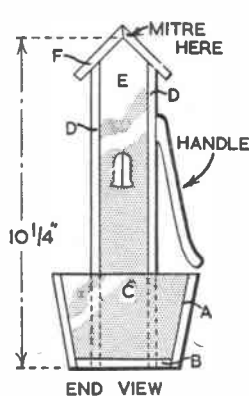


Fig. 2

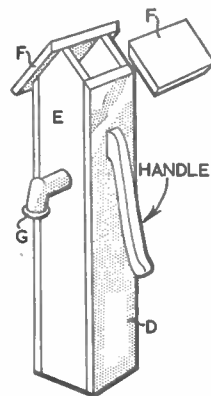


Fig. 4

Completing the 'HOBBY SPRITE'

IN the last article we had got as far as fitting the stringers to the top part of the fuselage 'pod'. Now fit the third longeron (previously cut) to engage with the slots in the bottom of formers F 1, 2 and 3, and check that it is parallel with the bottom edge of the basic keel. Cut the pieces which represent formers 3 A, 4 A and 5 A (see full-size drawing in previous article), then trace and cut two access door longerons, shown hatched on the main general arrangement drawing. Mark the stringer positions on the former rims.

The position of the access door longerons is indicated clearly on the drawing, and they must be fixed, temporarily, in this position with three small dabs of cement spaced out along the face of each. Cement formers 3 A, 4 A and 5 A in position, making sure that they align with each other, and with the formers already fixed in the top portion of the 'pod' (Fig. 6).

between the edges of the longerons on the door and the next adjoining stringers with tapering pieces of $\frac{1}{8}$ in. sheet balsa, and glasspaper flush. Do exactly the same between the longerons and adjoining stringers on the main pod — but only that area immediately above the access door (Fig. 7) will be affected.

By G. Allen

To facilitate the eventual covering of the 'pod' and the access door, it is now necessary to fill in the gaps between the stringers on the rims of formers 3 and 3 A. Do this with small pieces of $\frac{1}{8}$ in. square stringer material, and then glasspaper them to the outside contour of the formers. Also to ensure 'clean edged' air intake apertures when part of the

cut it out and paste it to the block, then use it as a pattern to cut the block to shape in side view. Use a similar pattern to cut the block to the same shape in plan view. Then cement the partly shaped block to the face of former F 1, and with a modelling knife or razor blade, and glasspaper, carve it to its final circular 'spinner' shape. Finally cut the two fairings from $\frac{1}{8}$ in. sheet balsa or hardwood veneer, and fix these in place as shown in Fig. 7.

Cover both the 'pod' and access door with separate strips of tissue each sufficiently wide to span no more than three stringers at a time, i.e. two spaces between stringers. Use special tissue paste supplied in tubes such as O-My, and available from Hobbies Ltd and branches. Trim each piece of covering flush with the stringers before fixing the next piece.

When completely covered, and when

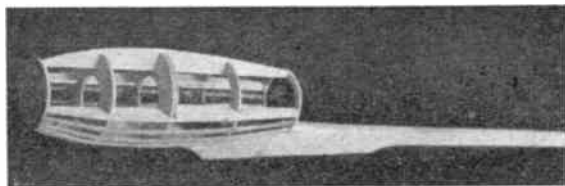


Fig. 6

Fig.
8

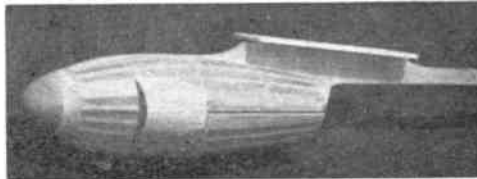


Fig. 9

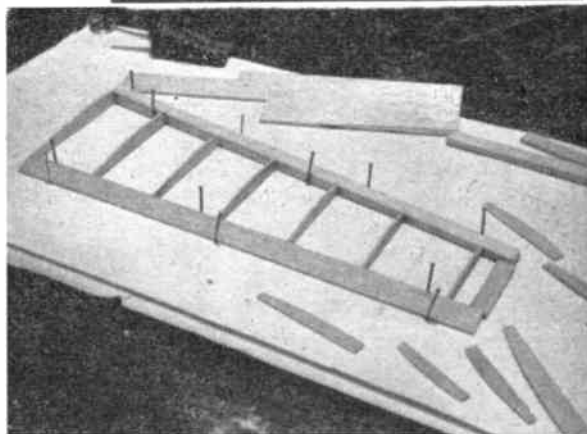
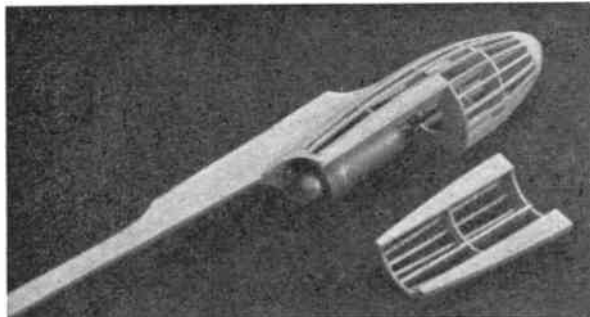


Fig. 7



Complete the main structure of the 'pod' by cementing the $\frac{1}{8}$ in. square stringers in position on the rims of the formers. Then with a keen razor blade, cut neatly through the stringers exactly between former 3 and former 3 A, and in a similar manner separate the three temporary 'joints' between the middle longerons and the access door longerons. This will leave the access door free from the 'pod'.

By trial and error fill in the spaces

eventual tissue covering is cut away, it is necessary to fill in the gaps in a similar way between the main longerons and the adjoining stringers.

Before covering the 'pod' and door with Japanese tissue, cut and fix the nosepiece which, as indicated on the drawing, is carved from a block of balsa comprising six pieces of $\frac{1}{8}$ in. sheet cemented and clamped together with their grains opposed to each other. First trace the base of the nosepiece,

the paste has thoroughly set (allow about two hours), spray the tissue lightly with cold water and leave it to dry. Then apply two coats of banana oil or one coat of shrinking dope. Cut away the tissue between formers 2 and 3 at each side of the 'pod' between the stringers adjoining the side longerons. These form the air-intake apertures.

Cut two pieces of $\frac{1}{8}$ in. sheet balsa (or $\frac{1}{8}$ in. sheet balsa glasspapered thin) to the shape of the air-intake covers —

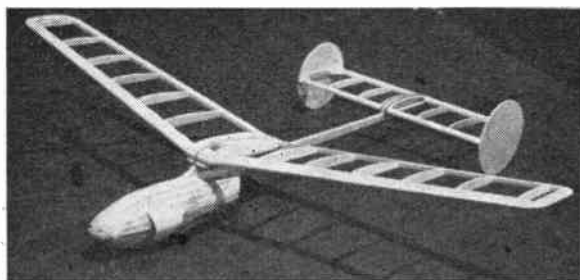
shown hatched on the main drawing. As shown in Fig. 8 these covers are bent to a shallow curve (to form scoops), and are cemented to the sides of the 'pod' over the apertures, so that their front corners rest on the stringers and their rear edges rest on the rim of former F 3. When set, apply two coats of banana oil to each.

In Fig. 8 the access door is shown in position, and it is held in place with $\frac{1}{2}$ in. wide strips of Sellotape, one at each side. It is an easy matter to remove one strip, allowing the door to swing open, which gives quick access to the motor and its retaining clip.

To complete the 'body' work cut the wing platform from hard $\frac{3}{8}$ in. sheet (4 in. by 1 in.) and fix it in place with impact adhesive such as Evo-stik. Similarly cut and fix the tailplane platform which measures 3 in. by $\frac{1}{2}$ in. Finally give the fuselage keel two coats of banana oil, and glasspaper smooth over the coats.

Construction of the tailplane is straightforward. Cut the ribs and cement them between the leading and trailing edges which have been clipped (to a full-size drawing) between rows of panel pins. Remove the unit, round off the leading edge, cement the strip of $\frac{1}{8}$ in. balsa over the centre rib, add the triangular gussets, and trim the structure with blade, and glasspaper. Then cut the two circular fins from $\frac{1}{8}$ in. sheet balsa, round off the edges, and fix them to the tip-ribs of the tailplane with impact adhesive. The use of impact adhesive

The Completed Structure



precludes subsequent contraction if balsa cement were to be used, and, therefore, avoids the buckling of the fins. Make sure the fins are perfectly upright.

Wing construction also is easy. (Fig. 9). Cut the tapering leading edge from $\frac{3}{8}$ in. square medium hard balsa, using a fretsaw, and smooth with glasspaper. Assemble the $\frac{1}{8}$ in. sheet ribs and wing-tip as shown, round off the tip and the leading edge, and glasspaper again. Make another *opposite-handed* wing panel in exactly the same way by turning the drawing of the first panel upside down, and by building the structure on its reverse side.

Join the two panels by the angled 'stub' leading and trailing edge pieces at the centre section, and make sure the wing tips are held 2 in. from the horizontal by placing books under each panel. When set, cover the two centre ribs on the underside of the wing with

$\frac{1}{8}$ in. sheet, as indicated on the drawing, and add the $\frac{1}{2}$ in. sheet cross-piece level with the top edges of the same ribs. Round off the leading edge and glasspaper smooth. This completes the structure of 'Hobby Sprite'.

The covering of flying surfaces has been dealt with in previous articles in this series, and this current project will present no difficulties. Cover the tailplane with two pieces of tissue and the wing with five panels, which includes a narrow piece for the centre section. Spray with water and, when dry, apply a single coat of banana oil. As indicated in the picture of the completed structure, the wing and tail-plane are held to the fuselage with strong elastic bands.

Note: The addition of air intakes on this model is *not* for scale effect. Jetex engines require plenty of air for their efficient operation, and the intakes on 'Hobby Sprite' are essential.

How to make a Puzzle of Squares

SIMPLE puzzles are usually the most effective and very often, because they seem so simple, cause the most fun. Your friends will like to have a go at trying to solve this one.

The puzzle consists of eight pieces of wood of equal size, and the idea is to fit these together correctly, so that the colours match and form complete squares. Around the edge of each piece are six half squares of various colours, and a half square of, say, red in one piece must fit against a similar colour in another piece to complete the harmony.

The puzzle can be made to any size, and we have chosen a 6 in. square, which will be quite easy to handle, and not too cumbersome. One about half this size would be handy to carry about in the pocket.

Cut a piece of plywood 6 in. square, and glasspaper quite smooth. Divide each side into four equal parts ($1\frac{1}{2}$ in. apart), and join these up, as shown at A with a blunt pointed tool, making a shallow groove or dividing line.

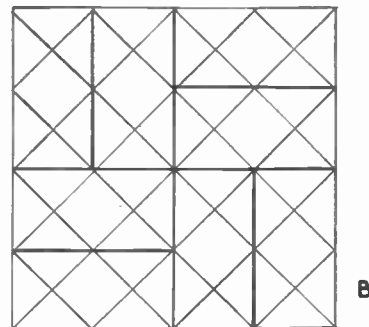
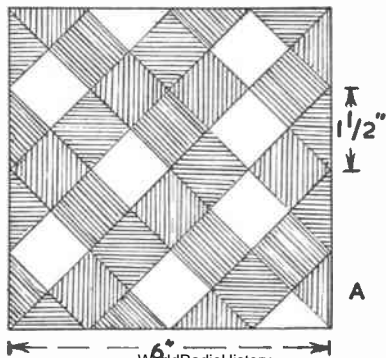
The squares and half squares thus

formed can now be filled in with any four colours that take your fancy. Oil paints or enamels are quite suitable. If you use poster colours these will need varnishing when dry in order to fix them. Strong contrasting colours are better than pale shades, and these could be bright red, blue, green, and yellow.

Instead of using paints you could, of course, cut out squares of coloured

paper, and stick these on to the wood. The placing of the colours has been arranged so as to make the puzzle as difficult as possible, and these should not be altered.

When dry, the square is cut into eight pieces of equal size, as shown at B. Give the cut edges a rub with glasspaper, so that no sawmarks are visible. When handing out the puzzle for solving, mix the pieces well. (A.F.T.)



MARGINS AND MOUNTING

WHEN a photographic enlargement is being made the question often arises as to whether the print would be improved by the addition of a black margin. If you will refer to Fig. 1 you will see how such a margin separates the picture from the surrounding typescript, attracting the eyes to the scene itself, and holding them within the frame. The same feature is noticeable in most cartoons, and in

By S. H. Longbottom

large exhibition paintings we find that a margin has been added in the form of a mount of some description.

There are good reasons for mounting our pictures, the principal one being that the mount isolates the scene from the immediate surroundings, and there is no competition with such things as the wallpaper. This enables one to both see and enjoy the picture to its best advan-

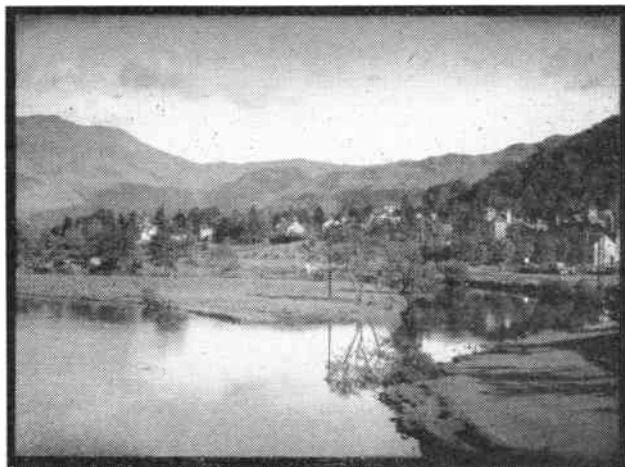


Fig. 1

picture there are two good ways of producing it. All you have to do is to prepare an opaque mask of thin cardboard which measures $\frac{1}{8}$ in. less in each

direction than the size of the picture, and which will allow a margin of $\frac{1}{8}$ in. on all sides. The card is laid on the paper after the normal exposure has been made, the negative removed, and a further exposure made of a few seconds with the naked light. The card must be placed on the paper quite squarely, and held in place with a weight.

Another way is to project the margin, producing a diffused internal edge. This is done by preparing a small mask one quarter the size of the picture, placing in the negative carrier and focusing on the paper. The diffused edge is produced by slightly throwing the image of the mask out of focus. In both instances the picture is exposed first and the margin later, and needless to say, it is essential that the masks are cut so that they are perfectly square. For a half-plate print you will require a mask measuring $1\frac{3}{8}$ in. by $1\frac{3}{8}$ in. for the projected image, and other sizes require masks in a similar proportion.

Having made the picture you may decide it worthy of a proper mount for framing, and here you will find a mounting guide extremely useful. Fig. 2 shows how to make such an accessory, using a piece of cardboard equal to the width of your mount. Although we have only shown divisions of 4 in. on each side of the central line, your guide should be at least 12 in. long and 2 in. deep. Mark in the central line, dividing each half into 1 in., $\frac{1}{2}$ in., and, perhaps, $\frac{1}{4}$ in. divisions, the sides being similarly treated. Here again the card must be accurately cut, or the picture will be out of true when mounted.

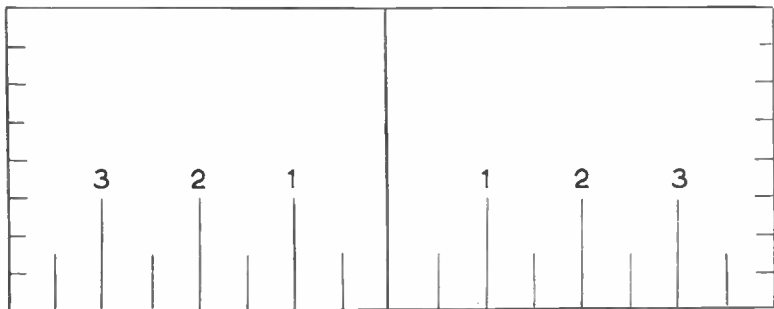


Fig. 2

tage, but whether we should add a black margin involves other factors.

As a general rule it is only advisable to add a black margin where the tones of the picture are light, and when it becomes necessary to isolate the print from a light toned mount. Our aim is to keep the eyes on the picture.

Some workers prefer to darken the four edges of a picture by printing these a little darker, shading the remainder with a piece of cardboard, and exposing for a little longer. The effect is quite unnoticeable if done with restraint, but there is a definite tendency towards darker tones at the edges, allowing the eyes to concentrate on the scene, as already mentioned.

Whenever a black margin is considered advisable for a particular

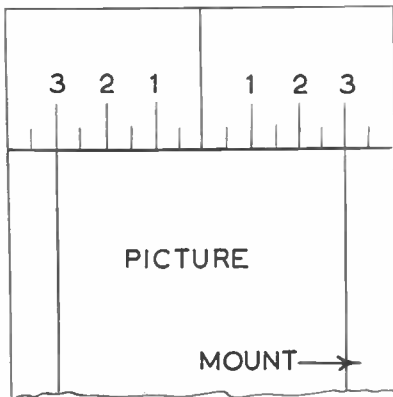


Fig. 3
WorldRadioHistory
350

ABOUT DEPTH OF FOCUS

WHEN a camera is focused upon an object at a certain distance, this object appears with maximum sharpness on the negative. But objects a little each side of the position of focus will also be photographed with reasonable sharpness. For example, if the camera is set to take an object 10 ft. away, objects at distances ranging from 9 ft. to 11 ft. from the camera may appear with reasonable sharpness on the negative. In such a case, the distances between 9 ft. and 11 ft. would be the depth of focus, or depth of field, which was secured when taking the shot.

By 'Photographer'

Some cameras, especially of fairly expensive modern type, have a depth of focus scale engraved on the lens mount, or elsewhere, so that the photographer can check the depth obtained. But many cameras do not have such a scale, and it is then helpful to use a separate automatic calculator, such as that shown in the diagram.

The depth of focus, or distances over which objects will seem reasonably sharp, depends on the lens aperture, and lens focal length. This calculator is intended for lenses of 7 cm. to 8 cm. focal length, such as will be found on almost all 2½ in. square, and 16-on-120 type cameras, including folding models, box cameras, and reflexes. The degree of sharpness which is considered sufficient depends to some extent on the purpose in view, but the calculator will allow negatives to be enlarged up to postcard, half-plate, or whole plate size, with a generally satisfactory standard of definition within the depth of field shown.

Using the calculator

The calculator consists of two discs pivoted together at the centre, so that they can rotate. The larger disc is marked with distances from 3 ft. 4 in. right round to 50 ft. and infinity. The smaller disc is marked with lens apertures, these beginning at $f/4$ each side the arrow, and going to $f/22$.

To use the calculator, it is only necessary to turn the inner disc until the arrow shows the distance at which the camera lens is focused. In the diagram, the lens is set at 15 ft. The near and far distances of the depth of field can now be read off against the aperture which will be used. For example, if the shot is taken at $f/4$, objects between approximately 12 ft. and 19 ft., will be sharp. If $f/8$ were

used, objects between about 10 ft. and 30 ft., would be sharp.

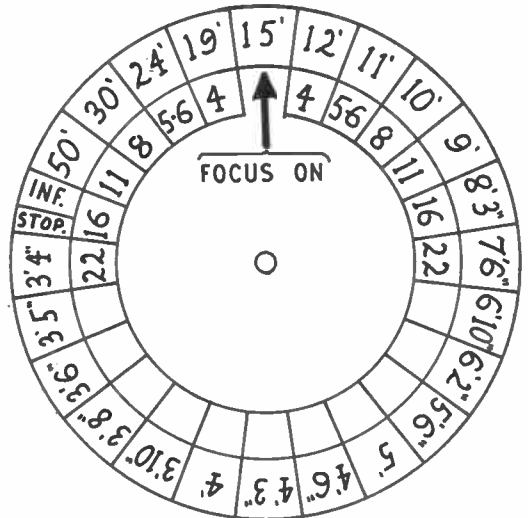
If the scene to be photographed included objects extending over only a fairly short range of distances from the camera, then an aperture of $f/4$ or $f/5.6$ would do well. But if there are objects at a wide range of distances, such as in a street scene, apertures such as $f/8$, $f/11$, $f/16$ or even $f/22$ will become necessary. $f/16$, for example, will allow objects from infinity right down to about 8 ft. 3 in. to be photographed sharply, if the camera is set at 15 ft.

Readings are not continued past the 'stop' mark where the infinity end of the scale meets the 3 ft. 4 in. mark. For example, $f/11$ covers from 9 ft. to 50 ft. and $f/16$ from 8 ft. 3 in. to infinity, but $f/22$ (with camera set at 15 ft.) covers from 7 ft. 6 in. to infinity, not 7 ft. 6 in. to 3 ft. 4 in.

The calculator is useful for zone focusing. That is, if the camera is set at 15 ft., and the aperture at $f/16$, then anything between about 8 ft. 3 in. and infinity may be snapped. This shows the conditions met with in a simple fixed-focus box camera, where the lens is of about $f/16$ aperture, permanently set at about 15 ft., so that anything from about

8 ft. to infinity can be taken. For closer objects, another good zone focusing setting for the camera is 9 ft. With the lens set at $f/16$, objects from about 5 ft. 6 in. to 19 ft. can be taken.

It will be seen that when the subject is near the camera, the depth of focus becomes very small. For example, if the subject were at 4 ft., and the lens were set to $f/4$, then at $f/5.6$ the depth of focus would be only 3 ft. 8 in. to 4 ft. 6 in. Even at $f/16$ the depth is only 3 ft. 4 in. to 6 ft. 2 in. This shows that it is particularly necessary to focus correctly for near objects.



●Continued from page 350

Margins and Mounting

Lay the guide at the top of the mount as shown in Fig. 3, with the picture in an approximate position. The picture is now removed, and the guide squared with the mount. You must verify that there is an equal distance from the central line to both edges and in Fig. 3 you will see that this distance is 3 in. This gives accurate centring of the picture. You must also see that the top edge of the mount corresponds with similar divisions on the sides of the guide, thus giving a correct depth of border. The picture is now replaced, and light pencil marks made round each corner to indicate the position of the print after applying mountant. The registration marks can be

erased after mounting.

The little mounting guide described will only take a few minutes to make, but it will save lots of time when you come to the mounting process, ensuring a neat finish. But do remember that it is most important to make accurate masks for your margins, since any errors will be very apparent when the picture is mounted. It is also advisable to give adequate exposure when making the margin or the picture will show through, and it will be wise to make a few experiments with the direct mask and the projected mask, noting that diffusion increases the more the mask image is thrown out of focus.

For duplicating your notices

MAKE A HECTOGRAPH

AS a simple device for duplicating letters, bill heads, sketches, leaflets, etc., the hectograph is quite effective and extremely useful for such organizations as Boy Scouts, Youth Clubs, and various local societies. By this means copies of originals can be rapidly made, and the method of reproduction is quite cheap.

The principle is to make a gelatine mould of a mixture which will be described, impress on this mould the document to be copied, and then take off up to about 100 prints.

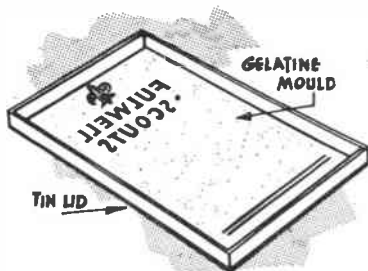
The ingredients for the mould are:

- 1 oz. gelatine
- 1 oz. brown demerara sugar
- 2½ ozs. barium sulphate
- 6 ozs. glycerine

The gelatine and sugar can be obtained from a grocer, and the other two ingredients from a chemist.

Break up the gelatine into small pieces — the smaller the better — put it in a container such as an old saucepan, add three ounces of water, and allow it to steep there for at least twelve hours. It is a good idea to break up the gelatine and add the water at night, and to leave this in the pan until the next morning.

Then add the glycerine and warm over a flame. When it has thoroughly mixed, add the sugar, being very careful to keep the mixture warm until the sugar



has dissolved. Now pour an ounce of water into a cup and mix the barium sulphate into it. Stir well and then pour it into the pan and allow it to mix with the other contents, helping the process on by heating.

A handy receptacle for holding the jelly is a shallow toffee or biscuit tin lid. Pour the mixture into this and leave until it hardens and is the consistency of smooth india-rubber.

Hectograph ink for applying on the original sheet of paper may be purchased, but here is a recipe for a good black ink which can be made at home. Take ¼ oz. aniline black (soluble in water), 2 ozs. methylated spirit, 2 ozs. water, and 4 ozs. glycerine, and warm until the colour is properly dissolved. Coloured inks may also be made with the same ingredients simply by varying

the aniline dye. For a red ink use eosin, and for green, methyl green.

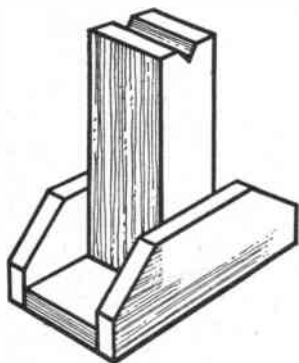
It is important to write the letter or circular on a smooth-surfaced paper (such as cream or blue laid). Duplicating or typing papers and 'bond' papers do not give the best results.

As soon as the writing is dry, place the sheet, writing downwards, on to the gelatine pad. Rub the paper gently but firmly with a soft pad, being sure it does not slip while so doing. Leave the paper in place for about ten minutes. You should then carefully peel the paper off the gelatine pad from the corner, when you will see a clear impression of the original writing on the composition. The impression will, of course, be in reverse.

Take a few sheets of paper and press each one for a second or two over this impression, and if all is well, you should have some excellent copies.

After use, and in order to erase any writing from the pad, sponge it carefully with cold water and leave to drain. A few hours should be allowed to elapse before making another impression on the same composition.

If you do not wash the jelly immediately, the ink will sink in, and the jelly will then have to be boiled and the top skimmed off before re-using. (E.)



A STAND FOR YOUR CAR CAN BE VERY HANDY

clearance of about 9 in. from the ground.

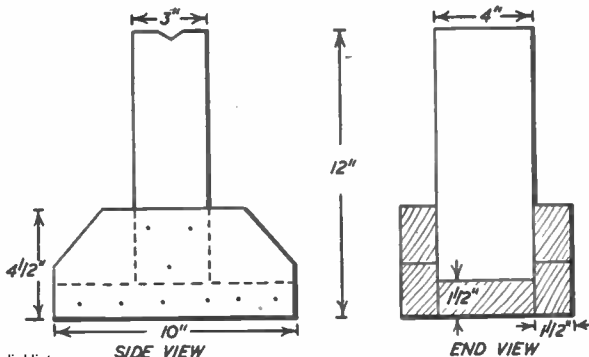
Each stand is made from the following pieces of timber: Post 10½ in. long × 4 in. × 3 in. Base 10 in. × 4 in. × 1½ in. Side pieces 10 in. × 4½ in. × 1½ in.

Cut a groove about ½ in. deep across one end of the post, as shown, and to the other end nail the base, fixing the post vertically in the centre of the base piece.

Shape the side pieces as shown and nail in position so as to hold securely the post vertical when in use. Three-inch nails should be driven through each side into the base and post.

Four of these stands would serve admirably for lifting the car off the ground when it is put up for storage.

(C.F.)



NOT infrequently the home mechanic requires to raise one or both ends of his car off the wheels. Quite serious accidents have occurred when bricks and blocks of wood have been used without being built up in a solid way on a sound base.

A most useful stand can be made quite cheaply from short lengths of timber, the one described here being suitable for a vehicle with an axle

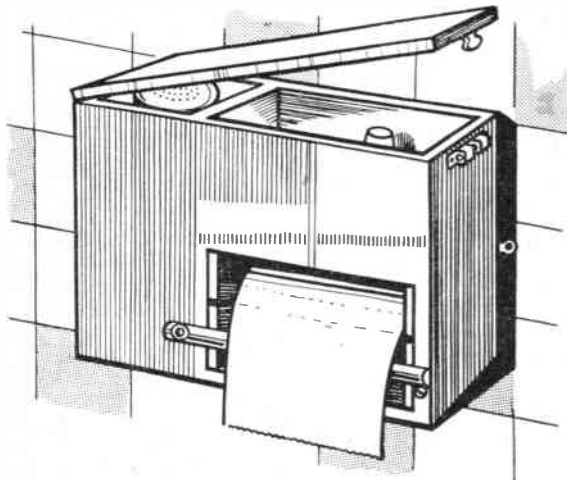
A FITMENT FOR TOILET REQUISITES

Described by
*T. S.
Richmond*

LIST OF PARTS

1. 11½ in. by 8½ in. ½ in. plywood or hard-board. (Back panel).
- As 1, but with aperture cut as in diagram. (Front panel).
2. Cut two 8½ in. by 3½ in. ¾ in. soft wood. (End members).
3. 10½ in. by 3½ in. ¾ in. soft wood. (Base piece).
4. 8½ in. by 3½ in. ¾ in. wood. (Partition).
5. 6½ in. by 3½ in. ¾ in. wood. (Shelf).
6. Cut two 3½ in. by 3½ in. ¾ in. hardwood. (Roller bearers).
7. 8 in. by ½ in. half-round beading. (Roller guard).
8. Cut 5½ in. length 1 in. diameter dowel. (Roller).
9. 11½ in. by 3½ in. ¾ in. or ½ in. plywood. (Lid).

Miscellaneous; Hinge, screws, two wall hangers, double ball catch, glue, panel pins, odd lengths ½ in. stripwood, paint.



THIS useful wall fitment has separate compartments for housing toilet roll, detergent container, bottle of disinfectant, and other small toilet articles. The front guard rail keeps the easily-fitted toilet roll within its compartment, and the hinged lid, with self-fastening ball catch fitment, conceals the contents.

Prepare all the parts detailed in the list. Cut the aperture in the front panel (2) with a fretsaw. Temporarily tack the bearer blocks (7) together for cutting the twin roller guide slots. Drive a screw in each end of the roller, and remove heads to provide free-turning axles.

Assemble the units as shown in the assembly diagram, securing with glue and panel pins. Fix the front panel, followed by the two bearing blocks, which are glued to the inside surfaces of pieces 5 and 3. Hinge the lid to the left

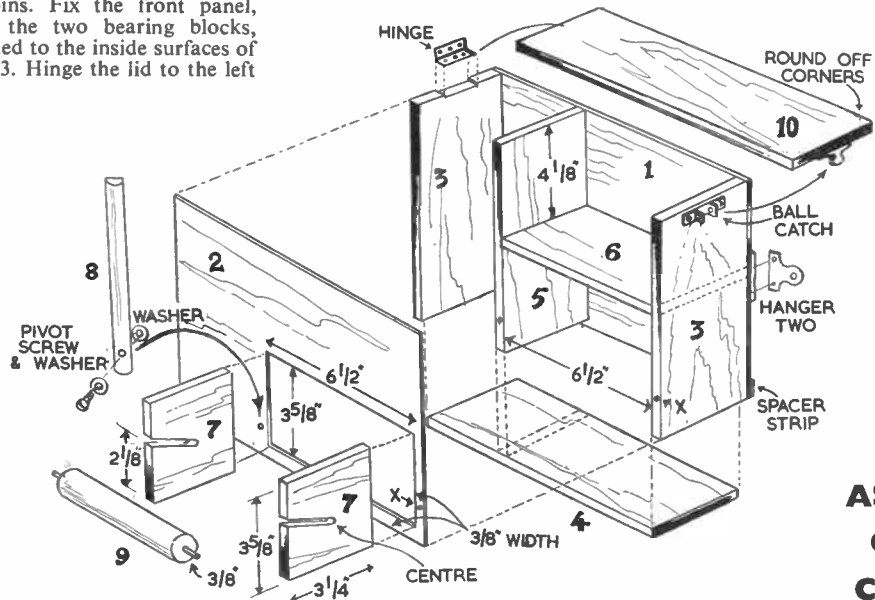
end member and fix the double ball catch to the right, under the protruding end of the closed lid. Fix odd strips of wood to the back of the cabinet to ensure free lifting of the lid when the cabinet is mounted on the wall.

Clean up with glasspaper and apply a flat coat of paint inside and out. Finish the cabinet and separate roller guard with gloss enamel or plastic paint of white, cream, or other colour to match existing room fitments.

Pivot the guard strip with a round-head screw and washers. A second screw to the other side of aperture (X) keeps the guard strip in position. Slots in the bearer blocks may be filed open or ends of the axle screws shortened

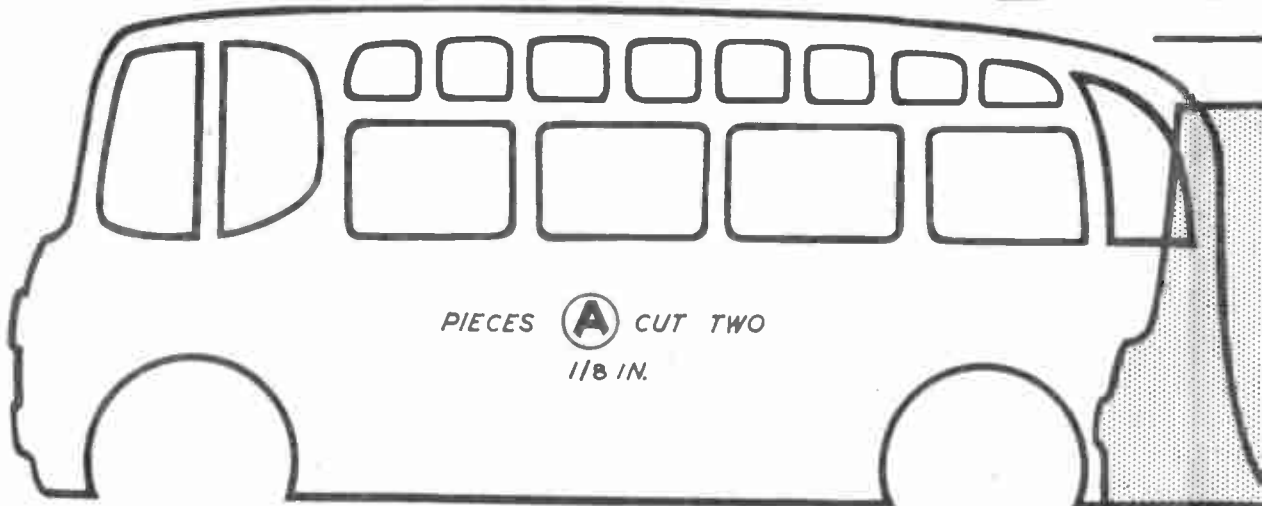
slightly if there is a tendency for the roller to stick.

Finally, plug the wall and secure the cabinet in a convenient position by two wall hangers. It will be seen that the long compartment at the left is intended for storing one of the round containers of cleansing powder, such as Vim.



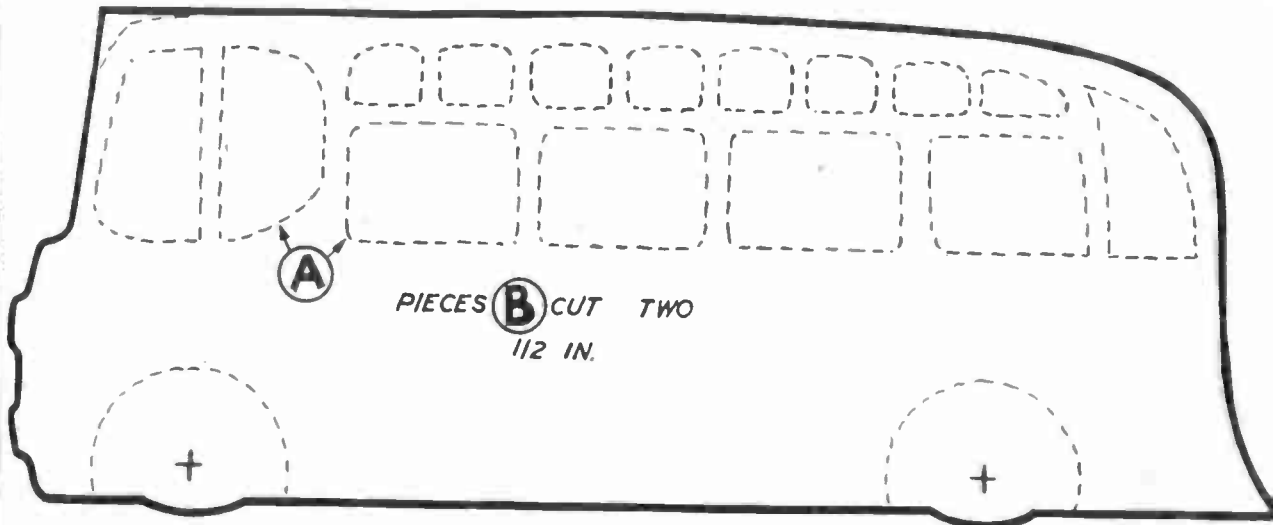
ASSEMBLY OF THE CABINET

TOY PULL ALONG LUX



PIECES **A** CUT TWO
1 1/8 IN.

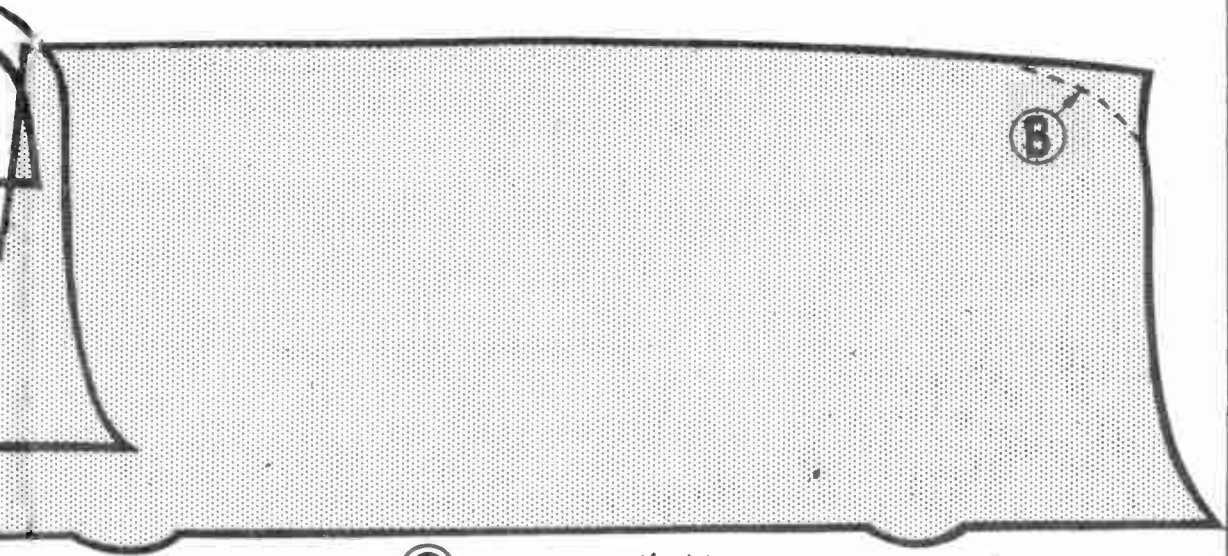
ALL PARTS FULL SIZE



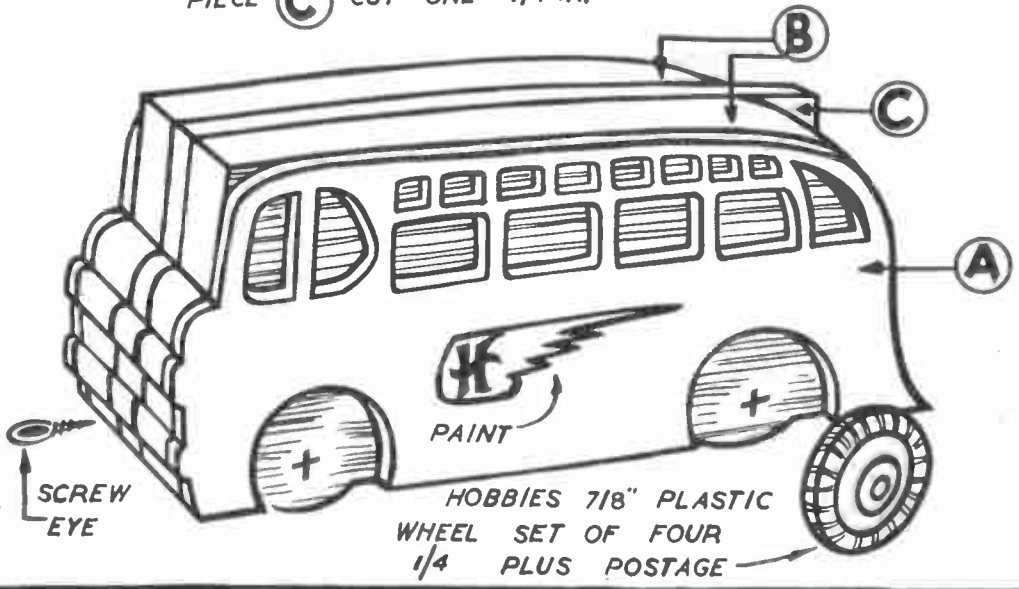
PIECES **B** CUT TWO
1 1/2 IN.

XURY COACH

7 IN.
LONG



PIECE (C) CUT ONE 1/4 IN.



SCREW
EYE

PAINT

HOBBIES 7/8" PLASTIC
WHEEL SET OF FOUR
1/4 PLUS POSTAGE

SHELVES FOR ALL PURPOSES

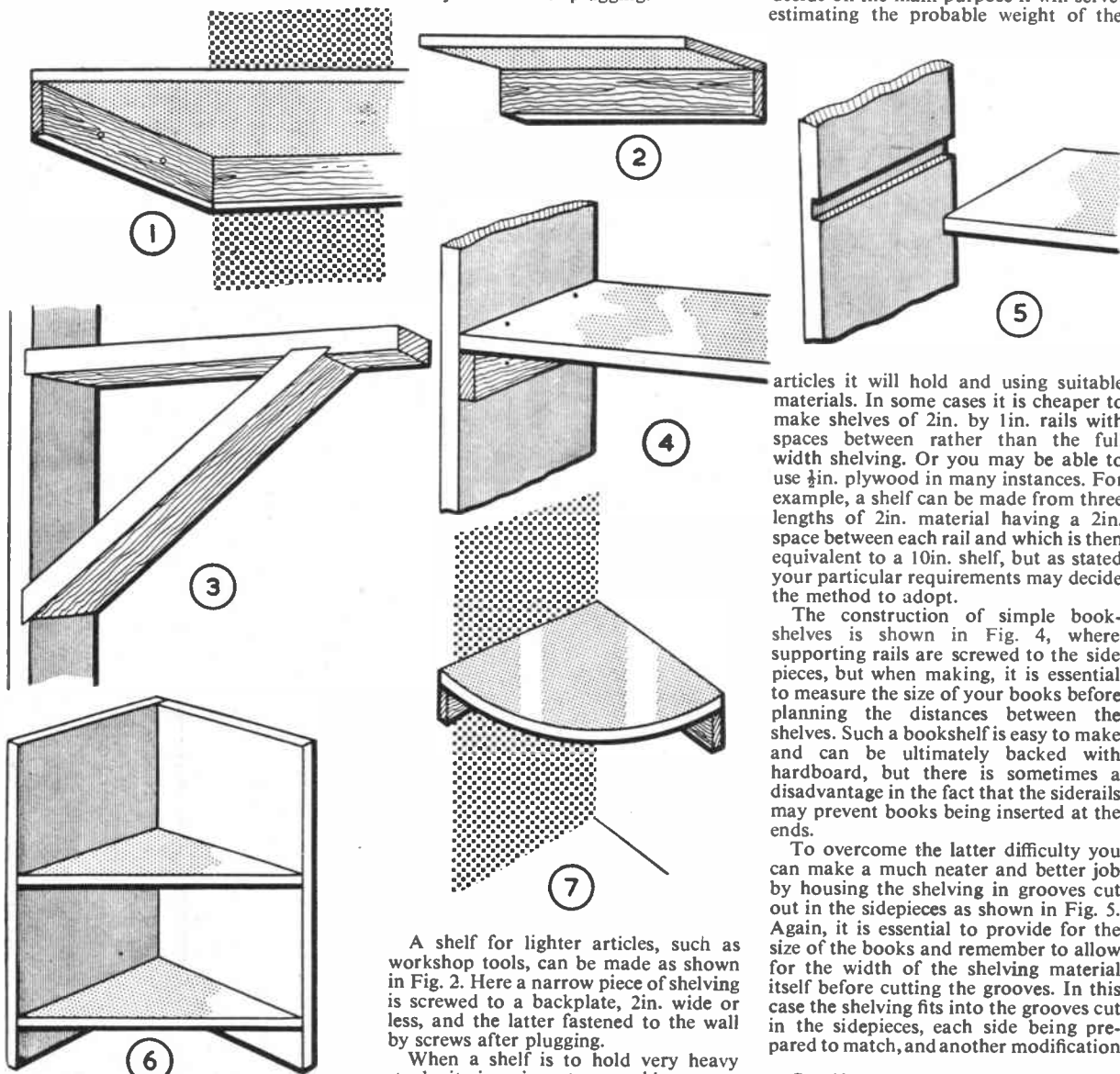
EVERY home and workshop requires handy shelves for either sorting kitchen utensils, books, pans or tools, and while they may be constructed on simple lines for some rooms a better job may be necessary for others.

In the kitchen it is often practicable to erect a shelf between two walls, an example being shown in Fig. 1, where a

wall plate is plugged to the wall at the rear and two siderails added according to the width of the shelf. The rails and wall plate should be made from 3in. by 1in. material and the shelving at least 1in. thick. Such a shelf can be fitted without any supporting brackets up to a length of approximately 6ft. or 7ft., and will accommodate heavy articles provided the rails and plate are firmly fixed to the wall by screws after plugging.

brackets fashioned as shown in Fig. 3. Here you will see that trenches are cut in the horizontal and vertical pieces, each about 8ins. long, and the stay itself fits accordingly, screws being used through the back to secure the horizontal and stay to the back plate. Metal brackets may also be used but they should have a similar stay.

Before making any shelf you should decide on the main purpose it will serve, estimating the probable weight of the



A shelf for lighter articles, such as workshop tools, can be made as shown in Fig. 2. Here a narrow piece of shelving is screwed to a backplate, 2in. wide or less, and the latter fastened to the wall by screws after plugging.

When a shelf is to hold very heavy stock it is wiser to provide strong

articles it will hold and using suitable materials. In some cases it is cheaper to make shelves of 2in. by 1in. rails with spaces between rather than the full width shelving. Or you may be able to use $\frac{1}{2}$ in. plywood in many instances. For example, a shelf can be made from three lengths of 2in. material having a 2in. space between each rail and which is then equivalent to a 10in. shelf, but as stated your particular requirements may decide the method to adopt.

The construction of simple bookshelves is shown in Fig. 4, where supporting rails are screwed to the side pieces, but when making, it is essential to measure the size of your books before planning the distances between the shelves. Such a bookshelf is easy to make and can be ultimately backed with hardboard, but there is sometimes a disadvantage in the fact that the siderails may prevent books being inserted at the ends.

To overcome the latter difficulty you can make a much neater and better job by housing the shelving in grooves cut out in the sidepieces as shown in Fig. 5. Again, it is essential to provide for the size of the books and remember to allow for the width of the shelving material itself before cutting the grooves. In this case the shelving fits into the grooves cut in the sidepieces, each side being prepared to match, and another modification

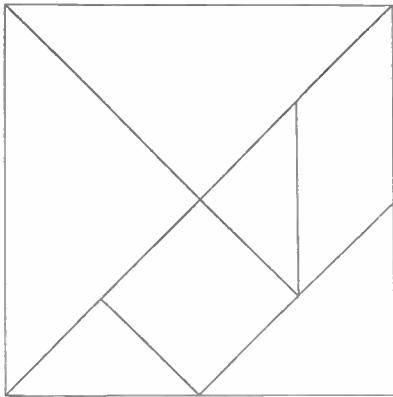
● Continued on page 357

Novelty to make

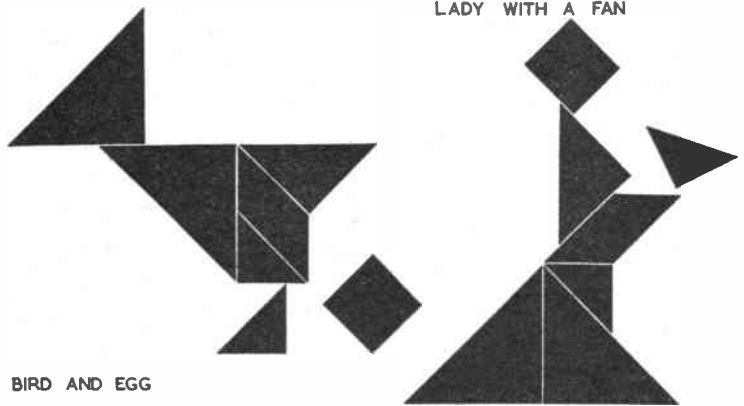
NAPOLEON'S 7-PIECE PUZZLE

DURING Napoleon's exile on Elba, he is said to have occupied himself with a four thousand years old Chinese puzzle called Tangrams, the seven pieces of which he is said to have cut out of black cardboard. A skilful manipulator can produce a variety of figures of surprising vitality and humour from the seven pieces, only limited by his own powers of invention.

Copy the diagram upon a piece of clean stout cardboard, then carefully cut out the seven geometrical shapes, using sharp scissors, or a penknife guided by a metal ruler. Set out the shapes upon a



How the 7 pieces are cut out



clear tablecloth or board and see how many different characters and objects you can represent.

The following three rules must be observed. All seven pieces must be used in the construction, no piece must be allowed to rest upon another, and the shapes must not be augmented by any others. You may, however, use two or more similar sets of Tangrams, provided that you still adhere to the rules.

Once you have become interested in Tangrams you will no doubt think of other ways in which the puzzle may be employed. Tangram pictures, composed of one or two sets, will look attractive on greetings cards if the parts are cut out of

brightly coloured paper and pasted into place.

You may prepare diagrams of more or less complicated designs, which are blacked in so that the methods of construction are concealed. These can be used for a puzzle game. Each player receives a set of Tangrams and one of the diagrams is shown to all. He who first succeeds in assembling the picture is declared the winner of a round.

A set of Tangrams, cut out of $\frac{1}{4}$ in. thick plywood with a fretsaw and made smooth with fine grade glasspaper, will look very neat if painted black and placed in a specially constructed wooden case. (A.E.W.)

● Continued from page 356

All-Purpose Shelves

of this type of fitting is known as 'stopped housing'. Instead of permitting the groove to run the full width of the sidepiece it finishes — or is stopped — about one inch from the front edge. When the shelf is prepared we must allow for this stopping by cutting away compensating material from the front edge of the shelf to a depth of $\frac{1}{2}$ in. In this way we can dispense with the necessity for rails as mentioned earlier and give a greatly enhanced appearance to the whole work.

There is often the need for small corner shelves as shown in Fig. 6 and which are particularly useful where space is restricted. Here, two triangular pieces are housed into two sidepieces made to fit a corner, but you can increase the

height and add as many shelves as desired. Moreover, the front edges of the shelves may be rounded and the top ornamented a little.

Fig. 7 shows a lighter type of shelf fitted into a corner and suitable for holding a telephone. It is made from two wall plates and a quadrant of $\frac{1}{4}$ in. plywood. This is a case where the fitting should conform with other woodwork in the room or be painted to match existing decorations. It will also be found useful for holding a table lamp, clock or other small articles in the bedroom, or can be made as a decoration for the hall to hold a vase of flowers. If made a little larger it can also be transformed into a tiny dressing table for a box room or small bedroom by the

addition of a mirror and a suitable curtain to cover the front. Do not forget however that not all corners of our rooms are built so that they are exactly at an angle of 90° and you should make tests before cutting the material if you require a perfect fitting.

The final finishing of all shelves depends on their main function. In the kitchen or workshop they may be left in the natural state of the wood or be painted to match other decorations. A bookshelf for the lounge should be made from better wood and will be enhanced by staining and polishing after careful smoothing in the usual manner. (S.H.L.)

Next week's free design will be for making a toy Whirligig. Make sure of your copy.

Mainly for Modellers

FOLLOWING on from the galleon period, we now consider the Jacobean and Stuart periods, when extravagant decoration began to be featured on British ships.

In Fig. 1 we have the bow of a Jacobean warship. In this we see the beginning of the transition from the galleon into the ship of the line, which became the main type of naval vessel for some two centuries. The galleon beak has been shortened, and we see the start of the carvings which were to become the feature of the Stuart vessels.

Our next example (Fig. 2) will need

very little introduction to our readers, especially those who followed my article some years ago on building a model

WOODEN SHIP BUILDING—6 By 'Whipstaff'

from a Hobbies kit. It is the famous 'Sovereign of the Seas', probably the most highly decorated sailing ship ever

to be built. In a small sketch we cannot put in all the elaborate detailed carvings, but the shape and design of the bow is well shown and is typical of the Stuart vessels of the 17th century.

The Decorations

A short description of some of the splendid carvings will be of interest to all who have made up this kit. The figurehead represents King Edgar on horseback, trampling upon seven Kings. The smaller figure in front of him is a Cupid astride a lion. On the bulkhead are six statues in various positions representing Counsel, Care, Industry, Virtue, Strength, and Victory.

In Fig. 3 we have an example of a Dutch ship. It is early 17th century, and so is contemporary with our own 'Sovereign of the Seas'. Note the upward sweep of the beak and the decorative carvings and figurehead, which, in this illustration, are shown only at the bow, quarter galleries, stern and bulkheads.

The bow of the 'Royal Prince' (Fig. 4) indicates the beginnings of the change taking place in ship design, the 'Royal Prince' (1610) being an example of the first steps from galleons into the warships that were listed as ships of the line. This vessel is often confused with the 'Prince', of 1670, and also with the later 'Royal Charles', formerly the 'Naseby'. A comparison of the bows of these three vessels is sufficient to place each one correctly in its period.

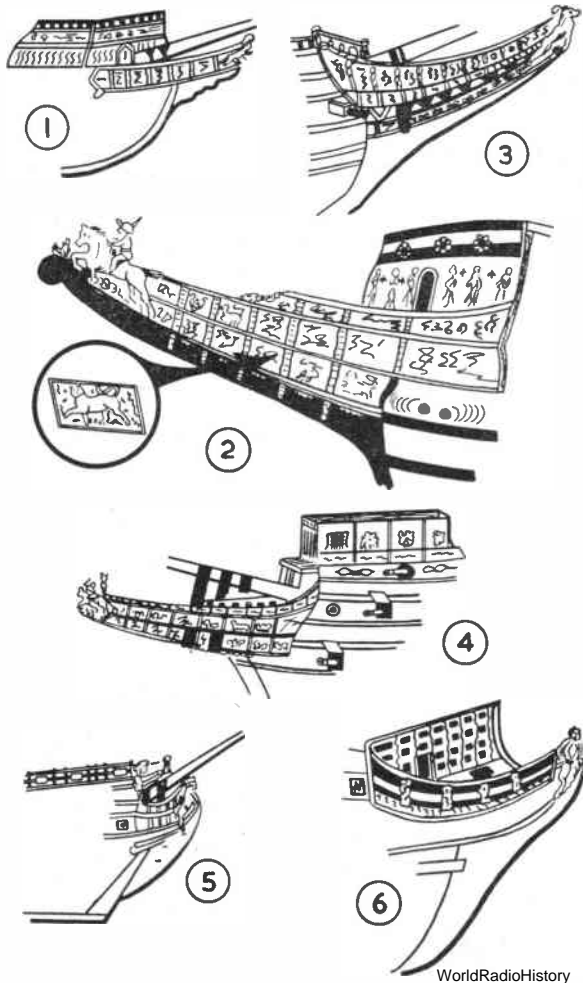
As we continue our research into the 17th century (French warship, Fig. 5) we find the beak disappearing and the shorter head and cutwater surmounted by the figurehead taking its place. With modifications, this type of bow persisted through the 18th century.

How they were rated

Our final sketch (Fig. 6) shows the bow of a medium-sized 50-gun ship of the British Navy. It was during this period that all ships on the 'establishment', as it was known, were rated according to size and gun power. The term 'first rate' was given to the larger warships of 100 or ninety guns, and as ships were progressively increased in size, eighty-gun ships were classed as 'first rate', the same upgrading taking place in the other ratings.

As a matter of interest the following are classifications at the end of the 17th century:

1st rate	90 to 100 guns.
2nd rate	82 to 90 guns.
3rd rate	60 to 74 guns.
4th rate	32 to 54 guns.
5th rate	26 to 32 guns.



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Domestic and Workshop Formulas

MOUTHWASHES are not very widely used in routine dental hygiene. This is a pity, for a suitable mouthwash tones up the gums. One which helps keep the mouth in good condition is made by first dissolving 2 ounces of borax in 3 pints of hot water, allowing this to cool, and adding a tablespoonful each of tincture of myrrh and spirits of camphor. After brushing the teeth in the usual way, rinse the mouth with a wineglassful of the mouthwash diluted with a half pint of water.

LIP SALVE

Lips which have become dry and cracked are quickly restored by a special salve. Heat up in a water bath 1 fluid ounce of oil of almonds, $\frac{1}{2}$ ounce of spermaceti, and $\frac{3}{4}$ ounce of white wax (bleached beeswax). When the waxes have dissolved in the oil, allow the solution to cool somewhat, and then pour into a screw-top jar. A little of this applied at bedtime will soften the lips overnight, and make them better able to withstand the harsh winter winds.

RUST REMOVERS

These are useful products to have on hand in the workshop. A good one may be made by shaking together in a bottle 35 c.c. of orthophosphoric acid, 30 c.c. of water, 10 c.c. of ethyl methyl ketone, and 25 c.c. of ethylene glycol monoethyl ether.

Another is based on stannic chloride. Dissolve 10 grams of stannic chloride in 100 c.c. of water. Add this to a solution of 0.2 gram of tartaric acid in 100 c.c. of water. To this mixed solution add a further 200 c.c. of water.

Degrease the metal first by wiping over with a petrol-soaked rag, brush on either rust remover, and allow it to act for a few moments. Wipe off with a moist rag, and then with a dry one.

MENDING MORTARS

If your Wedgwood mortar has been broken, there is a special cement which will repair it well enough for normal grinding, but not for crushing very hard substances. It consists of plaster of Paris and quicklime mixed with white of egg. It is important that the plaster and lime should be as fresh as possible. If either has been stored for any length of time it will have absorbed enough atmospheric moisture to weaken the cement.

Grind both to very fine powder, and mix thoroughly five parts of plaster by

weight, and one part of lime. Work in enough white of egg to give a paste. Apply this to the broken edges, bind together, and leave for about a week.

MATT BLACK PAINT

Users of optical instruments will doubtless be glad of this formula, since the bought material is rather dear. In a jar fitted with a good screw-top, mix one volume of amyl acetate and three volumes of acetone. In this dissolve celluloid clippings, so that a thin syrup results. Shaking the closed jar speeds this. Work in enough lampblack to give a paint of sufficient body, and keep the top firmly screwed on to prevent evaporation. If, after lengthy storage, evaporation does occur, it may be rectified by judicious addition of a mixture of one volume amyl acetate and three volumes of acetone. The product is inflammable, and should be used away from flames.

BATH STAIN REMOVAL

Coloured bath salts often stain modern porcelain-surfaced baths. If the stain resists the usual mild kitchen scouring powder, bleaching can be tried. Two aids will be required. First, a thin cream of bleaching powder ('chloride of lime'), and secondly a mixture of one volume of strong acetic acid and five volumes of water. Dab on the bleaching powder cream, and then follow up by dabbing on the dilute acetic acid. This releases a small amount of chlorine, which acts as a bleaching agent with most dyes. Several repetitions of the treatment may be needed, and if the smell of chlorine becomes objectionable, work with the window wide open, for chlorine is poisonous if breathed in any quantity. After treating the bath, fill it with water, and leave it a few hours before running off.

CHINA TO METAL CEMENT

This cement is best freshly prepared as needed. Melt together 12 grams of resin and 0.75 c.c. of boiled linseed oil. Stir in 1.5 grams of plaster of Paris, and apply the warm cement to the warmed articles, leaving a few hours to set thoroughly. It is best to leave the object unused for about a week, so as to allow the linseed oil to oxidize completely and form a really hard joint.

MARBLE REPAIRS

Broken small marble ornaments may be restored by a warm solution of gelatine. Dissolve 5.5 grams of gelatine

in 14 c.c. of hot water, and brush on to the fractured surfaces. Press together at once, and leave to cool and set.

NICKEL POLISH

A gentle polish for this metal can be made by shaking together in a bottle $3\frac{1}{2}$ ounces of whiting or precipitated chalk, 2 fluid ounces of paraffin (kerosene), and 6 fluid ounces of turpentine substitute. Use it in the normal way, finishing off by buffing with a soft cloth.

PIANO POLISH

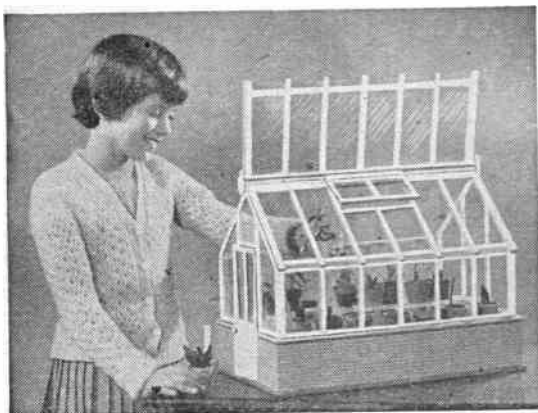
A simple polish is made by shaking vigorously together equal volumes of turpentine (not turpentine substitute), raw linseed oil, and vinegar. Use sparingly with a clean cloth, rubbing well in, and finish with a soft chamois leather.

BRONZE MATT DIP

Bronze articles may be given a matt surface by immersion in a mixture of 66 c.c. of nitric acid, 33 c.c. of sulphuric acid, 0.5 gram of zinc sulphate, and 0.5 c.c. of hydrochloric acid. Owing to the corrosive action of the acids on the skin it is advisable to wear rubber gloves and goggles. Any coming in contact with the skin should at once be washed off with water, and a cream of sodium bicarbonate and water dabbed on. The mixing, too, requires care. Put the nitric acid into a beaker standing in cold water, and with a glass rod stir in the sulphuric acid a little at a time, pausing if the beaker becomes warm and letting it cool again before proceeding. Now stir in the zinc sulphate and the hydrochloric acid. The mixture may be stored in a glass-stoppered bottle, preferably of brown glass or in the dark, for light causes oxides of nitrogen to be liberated from the nitric acid, so discolouring the mixture. The articles should be immersed until the desired degree of matting has been obtained, and then rinsed in water.

IRON FINISHING

A brownish-black iridescent finish may be given to iron articles by dipping in or brushing on a concentrated solution of potassium dichromate and then heating in an oven for a minute or two. Judgment of the heat demands a little trial with a piece of iron. If the iron colours water yellow when dipped into it, the oven heat is not high enough. If, on the other hand, the iron is black without the iridescence, the heat is too high. The finish may be intensified by repetition twice or thrice more. (L.A.F.)



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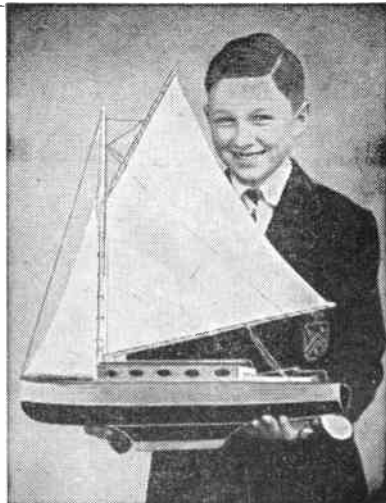


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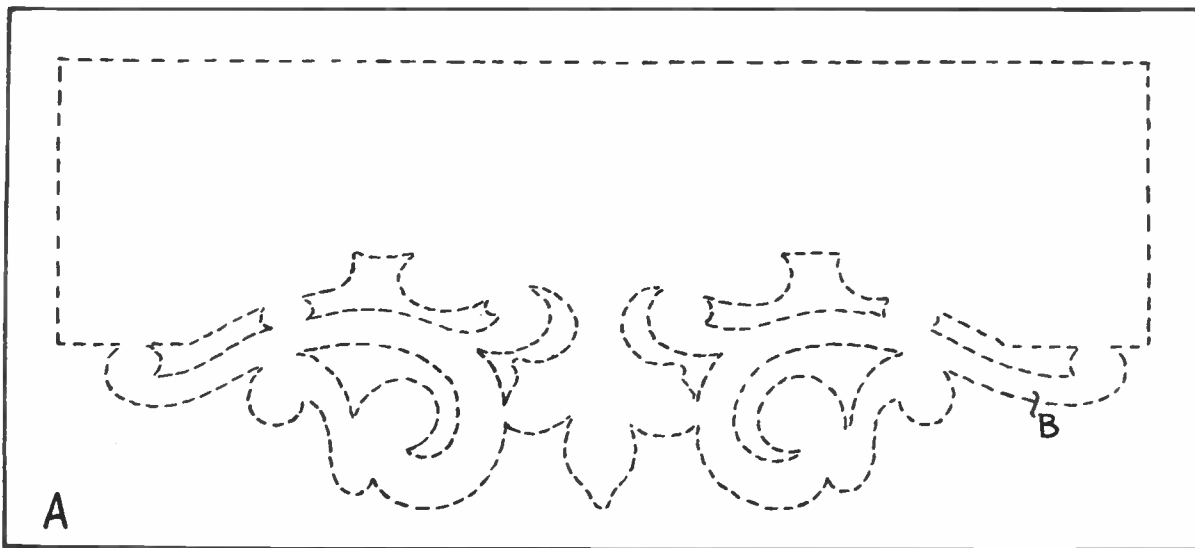
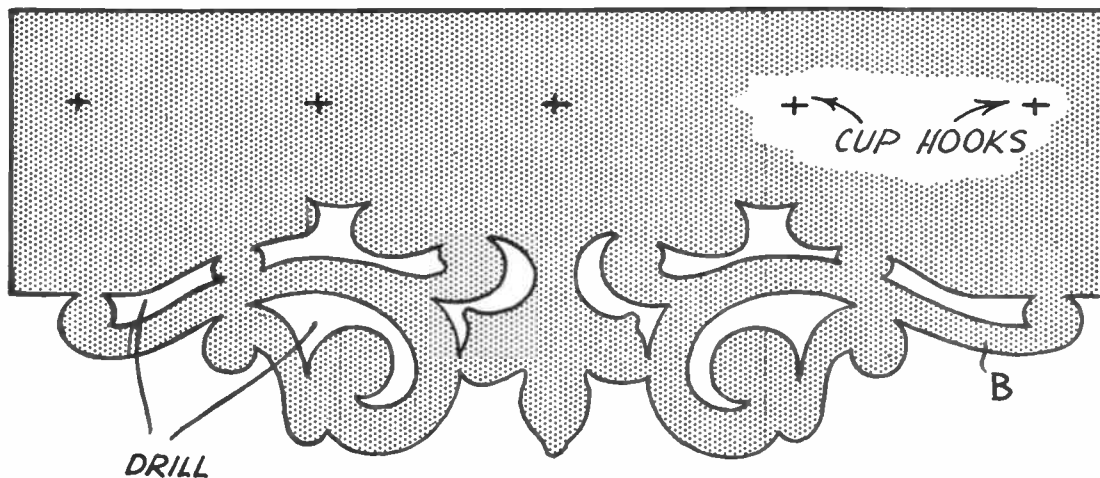
THE rack is made from $\frac{1}{4}$ in. wood, and is cut out with a fretsaw. It can be used for hanging oddments such as dog leads, ignition keys, or kitchen utensils. Trace the two pieces A and B, and transfer them to the wood by means of carbon paper. Use a fretwork drill to

make holes in the interior frets to be cut out. Thread the saw through, and cut out these portions one at a time. Next cut round the outline. Remember to keep your saw upright all the time.

Clean up the two pieces with glass-paper, and glue the overlay B to piece A

in the position shown by the dotted lines.

Paint or stain and varnish before screwing the hooks in place. Fix a metal hanger at the back for securing to the wall. (M.p)



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MR John Holmes of 'The Haven', Whitchurch, Reading, Berks., belongs to more hobby clubs than he cares to remember. 'The only time I do remember is when I receive the annual subscription notices,' he explained recently. Perhaps one of the least-known societies of which he is a member is the British Snail Watchers.

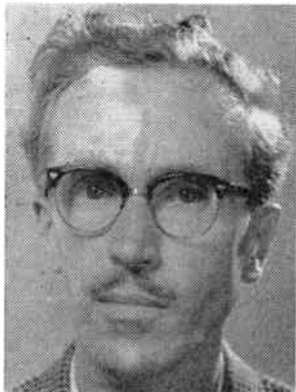
'THE HAVEN' OF MANY HOBBIES

'I collect anything and everything', he continued. 'My four children belong to the junior sections of many clubs; in fact, we are a hobby family.'

I found John's children very interesting. Richard, aged 9, is quite an expert on match labels, having a large and varied collection. 8-year-old Henry can talk for hours on cheese labels. Mary will be 7 next July. She has a large collection of hotel labels. Charles is only 4, but he already has a keen eye for stamps.

Mrs Elsie Holmes takes great interest in all these activities.

'People often ask me what I think about it all,' she says. 'My answer is always the same — hobbies are wonderful; they have united my family and could be a means of happiness to many homes.'



Mr Holmes of 'The Haven'

John, who is 44, gave me an amusing and interesting account of his early life.

'I attended Pangbourne County School, entirely without distinction. Was much too lazy — so I was told. The only thing in which I did excel was running. Usually away from some irate householder, who often had good reason to be so.

'My chief interest then — as now — was hobbies: cigarette cards, stamps, match labels and orange papers, in that order. Incidentally, I have never heard of anyone else collecting the latter.'

After leaving school, John started work in the family business, blacksmithing, engineering, etc. Hobbies, however, still took up most of his time. He became an enthusiastic autograph collector. Among the many famous people whose signatures he has obtained are the Duke of Edinburgh, Sir Winston Churchill, Lloyd George, Rudyard Kipling, King Boris of Bulgaria, Marshal Pétain, Von Ribbentrop, and the Kaiser.

Throughout the war John worked in his father's business, which was turned over to munitions work. He was a member of the Home Guard, Upper Thames Patrol, and was secretary of two National Savings Groups. His achievements have been mentioned on the B.B.C.

After the war he joined the newly formed Civil Defence Corps. He also



Two of the Holmes children

became interested in target shooting, subsequently becoming secretary of Pangbourne and District Rifle Club for five years.

On leaving 'The Haven' I remarked: 'You should have been a dealer in hobby lines!'

'But I am,' said John. 'I now sell match labels, etc!'

New Design for Franking Machines

A NEW and more attractive design for postal franking machine impressions has been introduced by the G. P. O.

The old design had been used since 1927, and the need was felt for something more in keeping with modern trends. At the request of the Post Office, the two companies who supply franking machines (Messrs. Roneo-Neopost Ltd, and Messrs. Universal Postal Frankers Ltd) undertook to consider a change, and with the advice of Sir Gordon Russell, then Director of the Council of Industrial Design, they asked Mr Stuart Rose to prepare designs.

The one eventually selected breaks away from the traditional representation of a postage stamp, and has as its main features the four national emblems, together with a symbolic St. Edward's Crown.

Mr Rose is a Member of the Society of Industrial Artists. He has also designed the Queen Elizabeth II Coronation Air Letter form, the present postman's badge, the GPO crest, and the current stamp book covers.

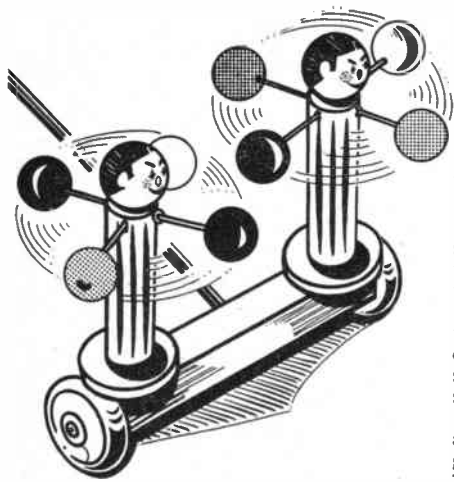
Franking machines were first used in Great Britain for the purpose of pre-

payment of postage in 1922. Up to 1939 only a small number of machines were in use. Since the end of the last war, however, their popularity has steadily grown, and there are now more than 36,000 machines of various types in use. In the financial year 1958-9, 1,830,000,000 meter-franked items were posted, and revenue from these amounted to £36,602,000, representing 23.2% of the total revenue from net sales of stamps and postage collected in cash.

Franking machines save time and trouble both for Post Office and users.



MAKE A CHILD'S TOY WHIRLIGIG



A BRIGHTLY coloured action toy gives immense pleasure to youngsters in the range of two to four years old, and this toy whirligig can be operated quite successfully by even young toddlers.

The action of the Whirligig is that, when pushed along, the figures are whirled round and round, due to operation on the wheels. As the figures rotate, the arms are extended, and a similar action is obtained when the toy is pulled backwards. In fact, it can be used in the same way as mother working the vacuum cleaner over the carpet. The Whirligig is 9 in. wide, and stands 7 in. high, with an extended handle.

The makeup and action are quite simple, and all detailed diagrams are given on the design sheet. Cut out the parts with a fretsaw, and clean them up thoroughly, preparatory to assembly. Incidentally, all the materials needed, such as wooden balls, wheels, and wire, are included in Hobbies kit.

Note that the bodies of the little men are built up from circles of $\frac{1}{2}$ in. wood glued together. Seven sections of pieces D form each body. Make sure that the holes in each piece are exactly centred, as the body will revolve on this central hole on a spindle F. At the base of each body glue piece C, which transfers the action on contact with the wheels.

Complete the bodies by fixing four screw-eyes to the top sections, as shown on the design sheet. The arms are made up from lengths of wire, and 1 in. diameter wooden balls, to give an overall length of $2\frac{1}{2}$ in. each. A touch of solder to the wires where marked X on the design sheet will give added strength.

The spindles on which the bodies revolve are made up and inserted into piece A. Construction is detailed on the design sheet, and the spindles are glued

into holes bored $\frac{7}{8}$ in. from each end. The heads consist of $1\frac{1}{4}$ in. diameter wood balls drilled to fit on top of the spindle piece F, but addition of these should be left until after the various parts have been tested for action, and painted.

Add the wheels by screwing exactly in the centre of the ends of piece A. The circumference of the wheels should be slightly above the level of piece E of the spindle.

Piece B, which has a hole drilled at an angle to take the handle piece G, is glued to the centre of piece A as shown. The handle is then glued into piece B, and finished off with a drilled $1\frac{1}{4}$ in. diameter ball at the top.

Paint all the parts in very bright colours, such as reds, greens, and

yellows. Faces can be painted on the heads, as suggested in the finished illustration. Ensure that the figures rotate quite freely on the wheels when the toy is pushed or pulled, and also that the arms lift freely before gluing the heads finally in place.

Hobbies Kit No. 3350 for making the Toy Whirligig contains panels of wood, wire, balls, wheels, etc. Kits, price 9/11 each, from branches, etc, or by post from Hobbies Ltd, Dereham, Norfolk (post 1/6 extra).

Fibre Glass Sheathing for an old Boat Hull

SOME time ago I wrote for this magazine an article on renovating old boat hulls. Unquestionably the most effective method of making an old hull safe is fibre glass sheathing, and many boat chandlers now stock the materials.

If you are interested in applying this material, the instructions for each particular product are supplied with the purchase. It is not a difficult job, nor does it take special tools.

By G. Gompers

First, measure the total length of your hull along the gunwales. Add at least 6 in. to allow for lap and trim, and double the length found to give you the cover of two sides. Then, measure the hull side from the gunwale to the keel at the beamiest part of the boat for the total width. Add 12 in. for lapping. This should give the amount of glass cloth needed, and from such knowledge any experienced chandler could advise on the quantity of polyester resin needed.

Clean the hull surface down to bare wood, removing all old paint and varnish, and leaving the hull thoroughly sanded

surface. A special wood primer can then be applied to ensure a good bond to the wood.

Then a thick layer of resin is laid on, and the glass cloth is laid on this. This is saturated by being worked into the resin with special rollers. Particular attention should be taken at places where greater strength is required. Sand smooth as necessary.

Now a brightly-coloured finishing resin can be applied for complete water resistance and a permanent tack-free service.

Fibre glass sheathing should not be applied in cold or damp weather. The temperature at the surface of the hull should be at least 60°F. (16°C.). Gentle heat may be applied to obtain this, simply and at low cost, using a radiant electric fire at a distance of several feet, a radiant paraffin heater (e.g. a Tilley heater), or a group of electric light bulbs. The surface temperature of an upturned dinghy may be raised by a heater or primus stove placed underneath it. A blowlamp must never be used.

Care should be taken not to use close weave cloths. They are difficult to impregnate, thus weakening the sheathing, and tending to form blisters.

MAKE AN ENLARGER FOR YOUR PRINTS

AFTER having reached a reasonably high standard in taking photographs, the amateur photographer will soon wish for a larger print than the usual small contact one. Although it is quite possible to have the occasional 'special' negative enlarged, it would be too expensive for them all to be treated this way.

By P. R. Chapman

In any case the most enjoyable part of the hobby is to produce one's own photograph, and for the best result, it is often necessary to select and enlarge just one part of the original. The obvious person to do this is the person who took the photograph in the first place.

Of course, for those with the money to spare, there is no shortage of enlargers on the market, but probably many amateur photographers have decided with reluctance either to give up their hobby, or resigned themselves to contact prints, owing to the cost of these instruments.

It is well within the ability of the average handyman to construct quite a satisfactory enlarger. Certainly it may not have the chromium-plated fittings of the commercial model, but these can cause unwanted reflections in the dark-

room, and are by no means an advantage.

Since few amateurs can enjoy the luxury of a darkroom, permanently fitted out, but have to improvise in kitchen or bathroom, the enlarger described is designed to pack into a wooden case, with the exception of the upright. When in use, the top of the case acts as the baseboard.

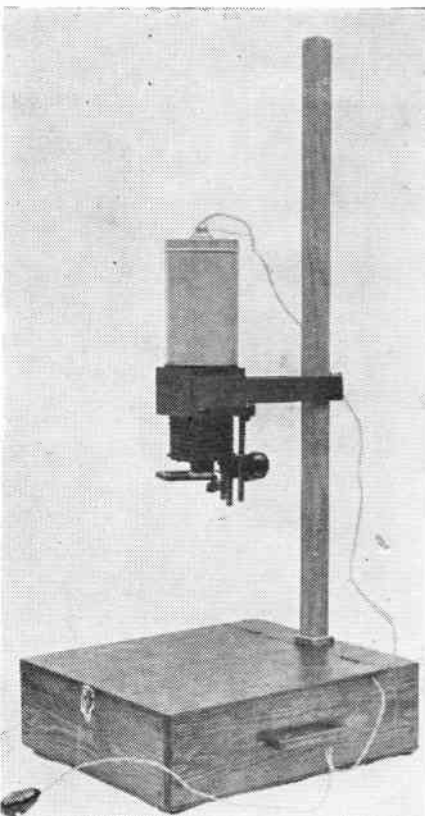
The optical arrangement of an enlarger is shown in the diagram 1. Light from the bulb is concentrated by the condensers A, passed through the negative B, and focused by the lens C on to the sensitive paper by means of a bellows and focusing arrangement. Apart from the lens, the only rather expensive item is the condensers, and the price of these will depend upon the size required, which in turn depends upon the size of the negative to be enlarged.

For the popular 35 millimetre film, 2 or 2½ in. condensers will be suitable, but if the '12 on 120' size is to be considered, the condensers will need to be about 3½ in. It is often possible to obtain condensers which are chipped at the edges, and although these are considerably cheaper, they are in no way inferior in use. Photographic shops dealing in second-hand apparatus will often be able to supply them.

Although the lens is the most expensive part of an enlarger, and as in most things one gets the quality one pays for, quite satisfactory results can be obtained with a fairly cheap lens.

Having obtained the condensers, preferably in a holder (otherwise a simple wooden or metal one will have to be made), it is best to commence the construction with the condenser housing A. This is a shallow open-ended box made from ¼ in. plywood to take the condensers in their mount. To the bottom of the box is screwed a piece of sheet aluminium E, diagram 2, with an aperture of about the same size as the negative (e.g., 2½ in. square). The condensers rest upon this. Two more strips F fastened to each side by screwing through the aluminium, act as runners for the negative holder.

For ventilation, 3 or 4 ¼ in. holes are drilled in two sides of the condenser housing, and light-trapped by strips of aluminium (painted matt black) on the inside. The front side of the housing should be hinged to admit the condensers.

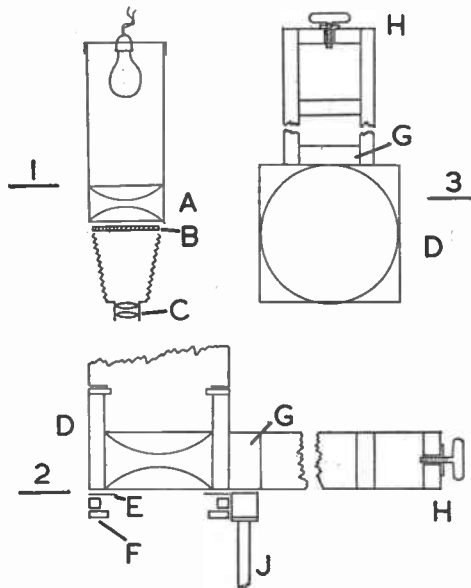


A tin, with the bottom cut out, is fastened to the top of the condenser housing, using a piece of plywood in between if necessary to fill any gap. A National dried milk tin is very suitable. The lid, which carries a lampholder, should be ventilated and light-trapped.

A block of wood G is screwed to the back of the housing, and two strips of wood 1½ in. wide by about ¾ in. thick and 8 in. long attached to this. Pieces of similar wood screwed to the other end of these constitute the clamp to attach the enlarger to the column, and the construction may be seen at H in diagrams 2 and 3.

The fastener for the clamp is a window thumb screw. A strip of stout sheet iron, bent at the ends, is slipped through the square hole for the thumb screw to bear against, thus avoiding damage to the upright column.

For the focusing arrangement, a bellows and some form of fine adjustment is desirable. It is possible to construct a satisfactory arrangement by means of home-made cardboard tubes, and, indeed, this is possibly the best thing to do for a start. However, for a

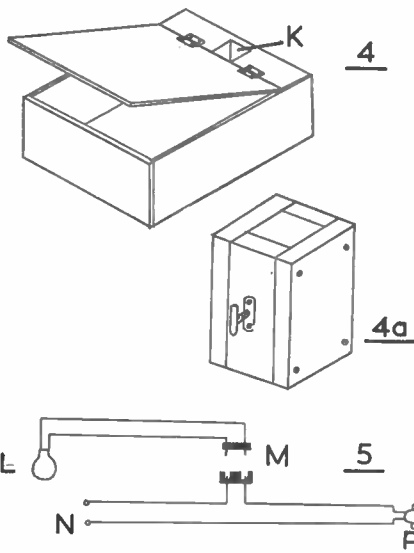


finished job, a proper focusing unit is desirable, and unless the handyman is an amateur mechanic, it will be necessary to purchase one of them, costing about £2 10s. 0d. J is the support for the focusing attachment.

The lens will, of course, have to be bought, and this is fitted to the lower part of the focusing attachment. For a 2½ in. square negative a 3 in. focus lens will be needed, or a 2 in. lens for a 35 mm. negative. These may be obtained from photographic stores.

The containing box, and also the baseboard, are made up as shown in diagram 4. The socket for the column is shown at K, and details of its construction can be seen at 4a. The thumb screw serves to tighten the column when in use. The top cover is of ⅜ in. plywood, and is hinged as shown, a square hole being cut in the fixed part to take the column. The latter consists of 1½ in. square hardwood about 3 ft. long.

Divisions and supports may be fixed inside the box to take the rest of the enlarger, with the exception of the column, and a handle should be attached, and, of course, a catch for the top.



It is useful to control the lamp by means of a pear switch. This is shown at P in diagram 5, which indicates the wiring. The lamp flex is attached to a 2 amp plug M, which fits into a socket attached to the rear of the case when in use. The lamp (a 75 watt enlarging lamp, not a domestic one), is shown at L, and the mains plug at N.

A negative carrier should be made to fit into the slot below the condenser housing. This is simply a piece of plywood cut to fit, and with a central hole 2 in. square. The edge of the hole is grooved to take two pieces of thin glass 2⅜ in. square (plywood can be grooved easily by cutting away a layer at a time with a sharp knife). The glass is held down by two metal clips.

If 35 mm. negatives are to be considered, the holder is made in the same way, but since in this case the negatives are usually kept in strips of six, a long narrow holder is necessary. The hole or slot should then be 1 in. by 9 in. With this shape only an upper piece of glass is necessary, the negative strip resting straight on the grooved edge.

How to conceal unsightly pipes

IN every house it is understandable that plumbing pipes have to be provided, but it is unfortunate that far too often they are left exposed on the walls of bedrooms, kitchens, bathrooms, etc. Besides being unsightly, exposed pipes are bad dust collectors, and make decorating jobs more awkward. If you are fed up with looking at exposed pipes in your house, then why not cover them up? This can be done very easily.

removed if access is required to the pipes at a later date.

If, however, the diameter of the pipes is quite large, or they are positioned away from the wall, then the foregoing method is not very satisfactory, because the projection from the wall would be too great for the fixing screws. The procedure to adopt in such a case is to plug two 1½ in. by 1 in. fixing battens to the wall at the sides of the pipes, so that the side members of the concealing box can be screwed to them as shown in Fig. 2. When this method is used, it is quite permissible to nail the hardboard or plywood in position because if access is required to the pipes, the whole box can be easily removed, leaving only the two fixing battens on the wall.

Finally, here is a novel way of securing the concealing box in position without the aid of screws. Make a box to cover the pipes as before, but this time use ½ in. thick timber for the front member instead of hardboard or plywood. Obtain some steel spring clips to suit the diameter of the pipes being concealed, and attach these to the back of the front member on the inside of the box. Space the clips about 3 ft. apart. The clips are then used to keep the box in position, as shown in Fig. 3. When access is required to the pipes, all that is necessary is to pull the box from the wall.



Fig. 1

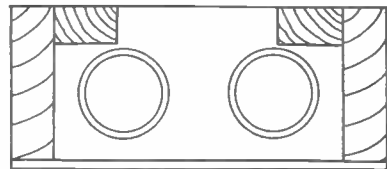


Fig. 2

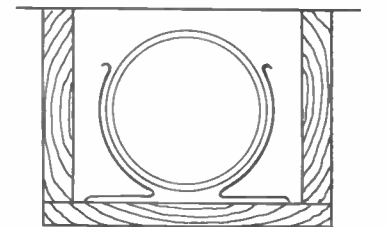
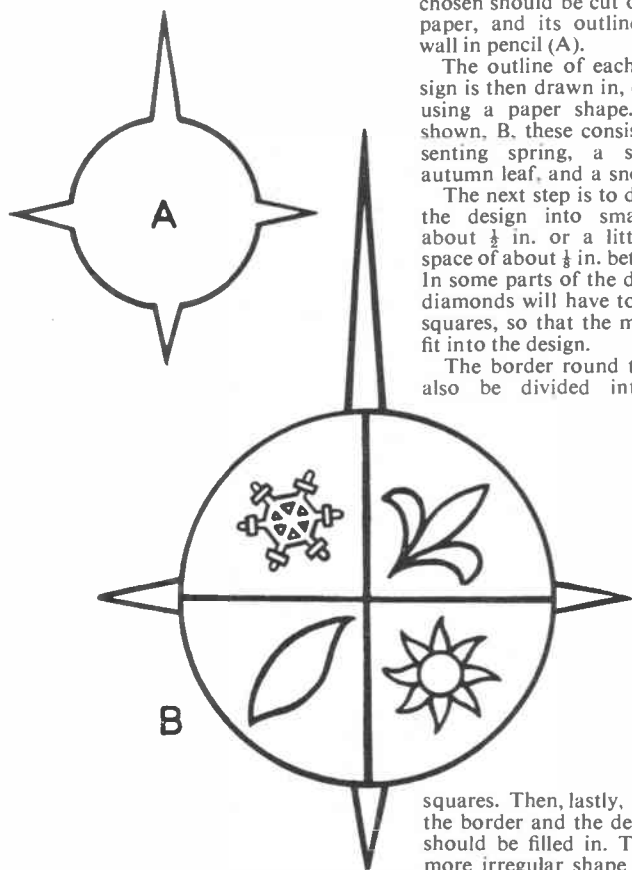


Fig. 3

By K. Finlay

The illustration at Fig. 1 shows how small bore pipes, which are not too far away from the wall, can be easily concealed. Two strips of timber are secured to the wall at the sides of the pipes. Use wood plugs or Rawlplugs for the fixings. The thickness of the strips should be about ¾ in., and the width should be just sufficient to clear the front of the pipes. In some cases it may be necessary to countersink the screws to obtain a more secure fixing. Once this is done, fix a piece of hardboard or plywood on the face of the wood strips. This cover piece should be screwed in position — not nailed. This will enable it to be easily

A MOSAIC DESIGN WALL DECORATION



chosen should be cut out of card or stiff paper, and its outline marked on the wall in pencil (A).

The outline of each detail in the design is then drawn in, either freehand or using a paper shape. In the example shown, B, these consist of a bud representing spring, a summer sun, an autumn leaf, and a snowflake.

The next step is to divide each part of the design into small squares, each about $\frac{1}{2}$ in. or a little less, leaving a space of about $\frac{1}{8}$ in. between each square. In some parts of the design, triangles or diamonds will have to take the place of squares, so that the mosaic pattern will fit into the design.

The border round the mosaic should also be divided into similarly-sized

AN unusual way of adding a distinctive touch of decoration to a wall, such as in the hall or bathroom, is to paint a design in mosaic fashion.

True mosaics are popular, but expensive, and a simulated mosaic in paint can look like the real thing from a distance of only a few feet. It also has the virtue of being far easier to do than it looks.

The following directions are for the design shown, which is a compass motif, quartered to represent the seasons of the year, but the same procedure applies to any design that you may choose. The one illustrated is 15 in. high and 12 in. across. Anything smaller than 1 ft. square tends to be less effective unless the design is very simple.

After doing the preliminary sketches on paper, the shape of the subject

squares. Then, lastly, the areas between the border and the designs in the centre should be filled in. These may be of a more irregular shape in order to fill in the awkward spaces, and they may also be a little larger, but the gaps between the squares must be kept to a constant size.

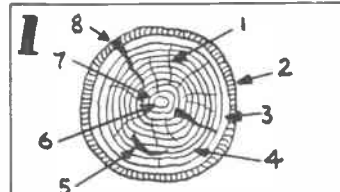
The 'mosaic' is now ready for painting. It should, of course, be on an unpatterned wall, and enamel paint, flat or emulsion paint may be used, depending on what the surface of the wall itself is covered with. At least half a dozen different colours should be used to get the proper mosaic effect. As a general rule, the border should be dark, the motifs in the centre painted in bright colours, and the background squares between them painted in pale colours.

When the paint is thoroughly dry, all remaining pencil lines should be removed with a soft eraser, so that all the squares of paint are completely isolated from each other, and stand out from the background of the wall like colours in a paint manufacturer's shade card. (A.L.)

TWO MINUTE

QUIZ

by Ed Capper

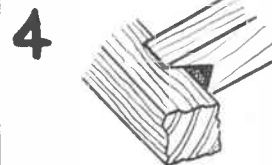


1 CAN YOU IDENTIFY THE MARKS ON TREE SECTION?

2 WHAT WOOD IS NON-INFLAMMABLE?



3 IDENTIFY THE NAIL-HEADS



4 WHAT JOINT?

5
$$\frac{P \times 4}{L \times 7} = N$$

WHAT FORMULA?

**ANSWERS ON
PAGE 376**

BUILT-IN WRITING TABLE

MANY houses today have small alcoves which are difficult to furnish because of their size. The writing table and cupboard described here should look well in any alcove not more than 3 ft. wide, and give the owner very useful service.

The framework should be constructed with lengths approximately 1 3/4 in. wide by 3/4 in. thick. First cut two lengths which, when fixed to the wall above the skirting, come to a height of 2 ft. 6 in. This is how high your writing table will be. It may, of course, be varied to suit individual taste. In these two lengths

By W. I. Roberts

cut two grooves 1/2 in. deep and 3/4 in. wide, some 5 in. from the ends. These are to take the top crosspiece shown in Fig. 1. To obtain a well-finished look, file or saw the bottoms of the two pieces to the same shape as the skirting top. Having made sure that the two lengths are level in height and exactly opposite each other, fix them to the wall, using three Rawlplugs and screws for each. It must be emphasized here that the frame must protrude from the wall to the same extent as the skirting when fixed.

The end members may now be screwed

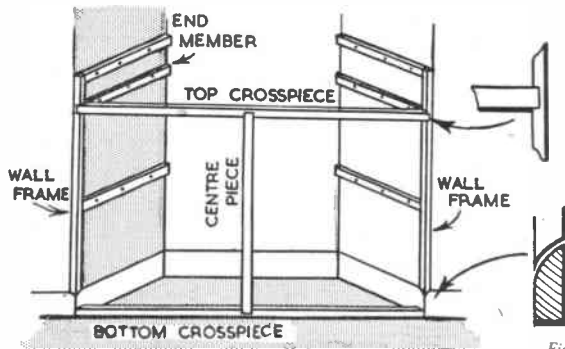


Fig. 1

into place. These should run the depth of the alcove, and will support the shelves. The top pair should run at right angles to the top of the frame. The second pair should be 5 in. below these with their top level with the tops of the grooves. The third pair should be some 12 in. below these.

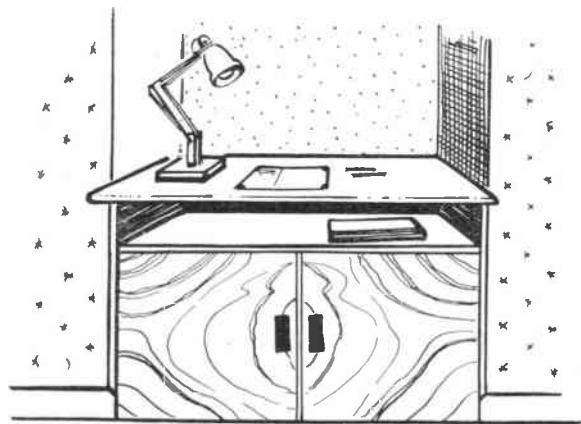
Now prepare the top crosspiece, but before fixing, cut a groove in its centre 1 1/2 in. wide and 1/2 in. deep. This is to take the centre piece, which is shown in Fig. 1.

The shelves are made of 1/4 in. ply or similar material. Cut the top shelf to the required size, sawing off the two front corners in order to clear the two side pieces of the frame. The shelf may now be nailed or screwed to the two end members and the crosspiece. In the same way, fix the bottom shelf.

At floor level insert a further length of framework extending from one skirting to the other immediately in line with the crosspiece holding the top shelf. In this piece cut a similar groove (1 1/2 in. wide,

1/2 in. deep) and insert a length of framework, extending into the groove previously cut in the top crosspiece. This length should be glued level with the backs of the two crosspieces, leaving a space in order that the doors close flush. A small right angle metal bracket may be screwed to the back of this piece, extending under the bottom shelf in order to give it additional support.

The writing top proper may now be slid into position along the two top end members. This should be 3/4 in. chipboard



or plywood, extending some 6 in. out of the alcove when screwed into position. The front corners can be rounded for neatness.

Hardboard is used to make the doors, backed by frames of wood 1/4 in. thick and

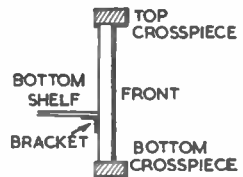


Fig. 2

2 in. wide (Fig. 3). Cut out two pieces of hardboard and place them on top of each other to ensure complete uniformity. When placed side by side, the total length of the doors should be about 3/4 in. shorter than the length from the inside of one wall frame to the inside

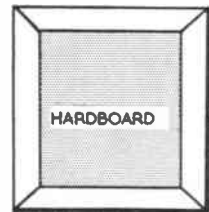


Fig. 3

of the other. Fix the backing to the hardboard with panel pins.

Attach the doors to the wall frames by hinges and provide suitable ball catches and handles. A colourful appearance can be obtained by covering the unit in a modern plastic material.

Making a Photographic Bas Relief

AN interesting example of the control of the photographic medium arises when we combine a negative and a positive of the same picture to produce a kind of low relief sculpture known as photographic bas relief, as shown in Fig. 1.

By S.H.L.

A contact positive of the original negative is first made on a transparency, proceeding in the same manner as when making a lantern slide, but for those not familiar with this process we should, perhaps, mention that lantern slides are obtainable in various sizes from 2 in. by 2 in., in the grades of slow contact, medium, and fast bromide.

The first mentioned will probably be the best for beginners to manipulate, and we proceed as though making a contact print on 'gaslight' paper, the emulsion side of the negative being placed to the emulsion side of the slide and an exposure to light being made. With a 60 watt lamp at a distance of 1 ft., you may find this exposure to be anything from one to one and a half minutes, but you must aim for a nice thin transparency, and testing for the correct time is essential. Thorough washing and drying is necessary, as usual. The negative print from the transparency, and one from the original, are shown respectively in Figs. 2 and 3.

The next step involves the binding together of the original negative and the new positive transparency, but this is where a slight adjustment becomes



Fig. 1—The finished print

necessary if we are to produce the bas relief effect. The two are bound together, emulsion to emulsion, but they must be approximately $\frac{1}{32}$ in. out of register. Hold the negative and transparency up to the light, first placing in exact register, then moving a little to the right and/or a little below the true register by movement of one or the other. You may also move to the right and below if you consider the combination more effective, for the approximate result can be seen when viewed in this fashion. This adjustment should be quite clear in the exaggerated illustration shown in Fig. 4, which represents a window frame, and if there is such a feature in your negative, it is best to use this as a guide. Secure the two with gummed paper at the edges, but not so as to damage the original, which may be required again in the future.

After testing the combination you may find the above degree of adjustment not to your liking, and much depends on the size of the enlargement

● Continued on page 373

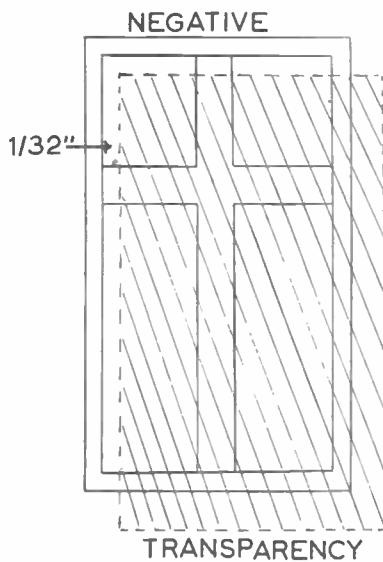


FIG 4



Fig. 2

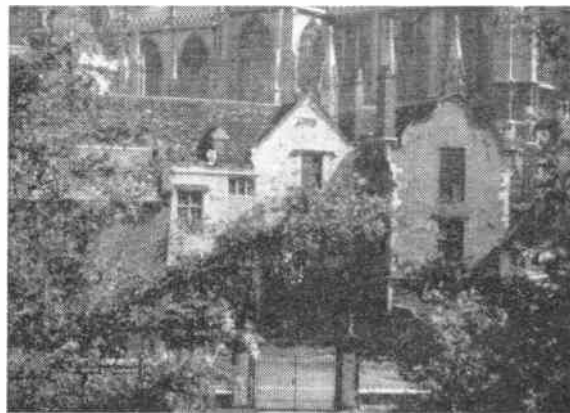


Fig. 3

THE CHILDREN'S FRIEND

MR GEORGE REID is a man with a great-hearted principle, and one which has endeared him to thousands of children all over the country. For this 73-year-old pensioner of 3 Shaw Park Cottages, Ballingry, Fife, Scotland, has during the past forty-eight years sent loads of wooden toys of his own making for distribution to sick and needy youngsters in hospital, and all out of the goodness of his own heart, for he has not claimed a penny piece for a single one.

The inspiration for all this work followed a visit to a sick children's hospital at Edinburgh, and it was there he sent his first consignment of toys. Encouraged by the pleasure these had given to the ailing children, he determined to continue this work, and spread his gifts to hospitals all over the country. And so it has gone on for years and years.

We are pleased to know that Hobbies have had a hand in this work, because Mr Reid started his toy-making fifty years ago on the Briton fretmachine, and some of his ideas for toys have been gained from the pages of *Hobbies Weekly*. Incidentally this type of fret-machine is not now in production at our works, having been superseded by more up-to-date models, but this old faithful is, as Mr Reid says, 'still good for a long time to come', despite a little wear in one or two parts.

By this manner of spreading gladness over the years, Mr Reid has gained thousands of 'little friends', many of

whom have written from all over Britain, thanking him for his generosity and 'Santa Claus' spirit.

Many of Mr Reid's toys are of the simple kind, such as 'jumping jacks'

operated by finger pressure on two sticks, swinging parrots, toy barrows, etc. This old age pensioner finds that if skilfully made, and nicely coloured, they are very acceptable to small children.

Obviously this labour of love costs a deal of money, and other well-intentioned people have been pleased to help Mr Reid in this respect. For one thing, postal delivery costs are now very much higher, and following a note to this effect in a national paper, Mr Reid was helped by readers to the extent of £20 or £30.

A big regret is that at Christmas he had to turn down three invitations to parties because of doctor's orders, but he has every intention of resuming his toy-making activities as soon as he is well enough. Readers will join with us in wishing 'Good Health' to this kind man with the love of all children in his heart.



Our photograph, which is published by courtesy of 'The People', shows one of Mr Reid's young friends keenly interested in some unfinished toys.

● **Continued from page 372**

Photographic Bas Relief

you are making. Further experiment will quickly reveal whether any further alteration is required. If the transparency and negative are too much out of register, there will be conspicuous thick black lines surrounding the subject, while if too fine, there will be a general flatness, and the sculptured effect will be lost.

The print, as in Fig. 1, is made with the combination negative in the enlarger carrier in the usual way, but you will find that half as much more exposure is required, due to the additional density.

The best effects are probably obtained with architectural subjects such as castles, churches, and the like, but

flowers can also provide interesting specimens. At the same time there is no reason why you should not try the method on any kind of subject, including portraits.

You are warned that the transparency must be on the thin side, since one with a density equal to that of the negative would only neutralize the two, making printing a difficult matter. A box of slow contact lantern plates measuring 2 in. by 2 in. costs 5s. 10d. for a dozen plates, and these will be quite useful for experiments with bas relief. Remember that they are packed with the emulsion side face to face in the box, and they must only be opened in the darkroom.

Patterns for making a model Sedan Chair will be included among many other interesting projects in next week's issue. Make sure of your copy.

FUN WITH SURFACE TENSION...

IT is generally well known that oil, sprayed thinly upon stagnant pools where mosquitoes breed, will check the increase of these troublesome insects. Oil reduces the forces of attraction between the molecules at the surface of the pond. Thus the elastic-like 'skin' of molecules at the surface is weakened and the mosquito larvae, or 'wrigglers' which live in the pond, cannot cling to the surface when they swim up to breathe, so they die. We say that the surface tension of water is greater than that of oil.

By A. E. Ward

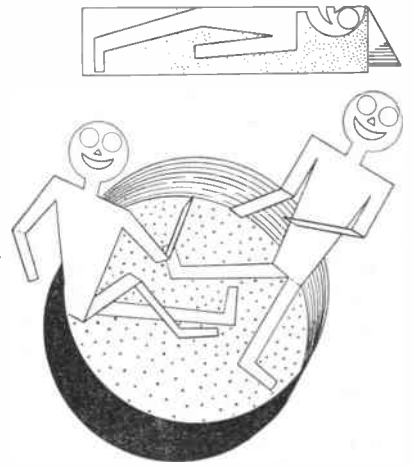
A dramatic little experiment will demonstrate how the surface tension of water may be lessened. Pour water into a grease-free bowl, and place a small square of iron wire gauze upon the surface, to provide an unusual miniature raft. You will have no difficulty in floating the heavier than water raft, because the wire mesh will merely dent the surface 'skin', and not break through and sink. It will be possible to support the weight of quite a large cork upon the raft. Now touch the water surface with a bar of soap or drop a small quantity of oil upon the surface, and watch what happens. The raft will sink immediately,

because the soap or oil molecules, which rapidly spread out over the water, will so weaken the surface tension, that the iron raft can no longer be supported.

A razor blade will rest with ease upon the surface 'skin' formed by water, and, with a little care, you will be able to make a steel needle float. Support the needle upon a short strip of tissue paper, then lower the paper 'stretcher' gently into a bowl of cold water. As you push the paper beneath the water, the needle will be left behind upon the layer of tightly adhering molecules at the surface. The needle will be seen to make a slight dent in the surface.

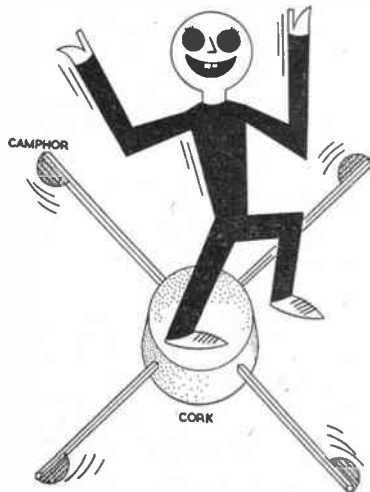
Edward Lear featured a seemingly impossible boat in his famous nonsense poem about the Jumblies who went to sea in a sieve. Make such a boat by knocking several dozen small holes in a cocoa tin lid, and then coating the interior of the lid with a thin layer of water-repellent candle wax. Prick the holes clear of wax, using a pin. Your boat will float without difficulty upon a bowl of water, and will be able to support a crew of Jumblies, which you can fashion out of stiff paper.

Some fragments of gum camphor, when placed in water, will hurry about over the surface, like dancers in a curious ballet. The reason for this is that the camphor fragments commence to



dissolve unevenly in the water, and lessen the surface tension. The pieces of camphor will be attracted to where the surface tension is stronger, and so will move along. Dip a corner of a block of soap into the bowl, and watch the camphor fragments retreat to the far side, as the soap molecules spread and further reduce the surface tension. Gum camphor may be bought at a chemist's shop.

...and an (almost) Perpetual Dancer



PERPETUAL motion is really impossible to obtain, although many inventors have tried to make a machine which would go on working forever without further expenditure of energy once it has been started. The little toy described here will continue to turn around for many hours, but eventually it will stop. However, a child will be very pleased with the long performance of this quickly-constructed floating dancer.

Select a large round cork, from which cut a $\frac{1}{4}$ in. thick slice to serve as a base for the dancing figure. Four 6 in. long arms of $\frac{1}{8}$ in. strip balsa wood are secured to the cork with balsa cement, to form a neat cross.

Now you will need a small quantity of gum camphor which you can buy at a chemist's shop. Cut out four small blocks of camphor, using a sharp knife. To each of the balsa arms put one of the blocks,

so that the resulting arrangement faintly resembles a swastika shape.

Finally, you must draw a comic character upon a piece of cardboard. Cut out the figure, and paint it in cheerful, bright colours. In the middle of the cork, cut a small slot, and mount the figure, upright, upon the lightweight base by inserting the feet into the slot. Your completed toy should resemble the gay figure shown in the illustration.

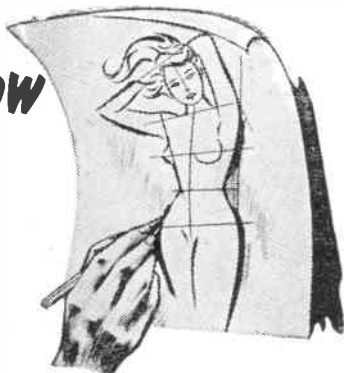
When the toy is floated upon a bath of water it will begin to rotate, and will continue to do so until all the camphor has been slowly dissolved.

Differences in surface tension will explain the turning movement of the toy. As the camphor dissolves, it reduces the surface tension over the water on the sides of the strips to which it is attached. The greater pulls of the water molecules on the opposite sides of the strips cause the wooden cross to rotate.

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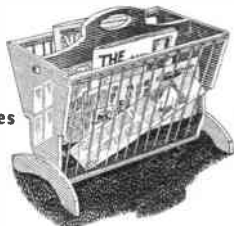
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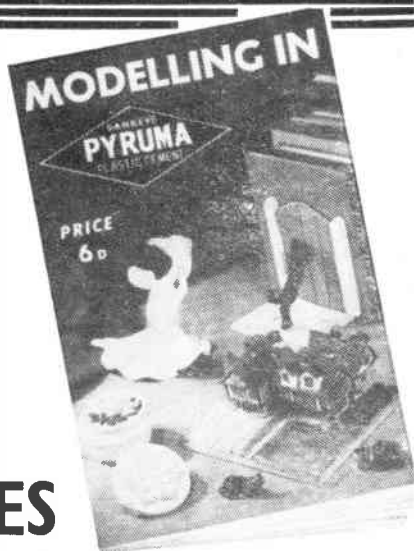
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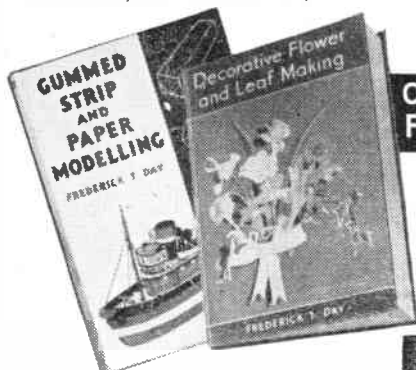
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ORNITHOLOGY

IT had been a pleasant October day, but now the sun was slipping slowly westward. Heavy cloud was collecting on the horizon, and threatening a little rain later, but overhead something unusual was happening. Herring Gulls, in groups of about a dozen, were coming from every direction, and converging directly over a nearby hill. They flew at a low altitude until they were over the steep cliff-like side of the hill, then their wings ceased flapping. For a moment they hovered there, then, as though some invisible hand took a hold of them, they rose to about 500 ft., vertically without a movement of wing, and then headed seaward in their thousands. This went on for a half hour or so.

THE JUNIOR BIRD RECORDERS' CLUB

'The hill in question was Helsby Hill in Cheshire. The west side of this hill is practically vertical, and is often used by rock climbers. From the base of this hill the land reaches in a flat plain toward the Mersey estuary.

'I realized after a while that a slight draught swept across the plain, then, meeting the hill, it was forced upwards to cause a powerful up-draught. The gulls were coming from miles around to this up-draught in order to gain altitude for their westward flight.'

This is just a small entry in an ornithologist's notebook, a notebook that is full of scientific data, unusual natural phenomena, and life and death drama. This could have been observed, and written by a fifteen-year-old just as well as a fifty-year-old, in fact notes similar to this are written, and reported to the appropriate authority by very many teenagers throughout the country. The number, to be precise, is 3,000. The authority is the Junior Bird Recorders' Club, which is organized by the Royal Society for the Protection of Birds. Membership is open to anyone between the ages of 11 and 18 years, and costs 2/6 per annum.

The club issues a bulletin three times a year called 'The Junior Bird Watcher'.

Many youths under 21 are interested in birds, but far too many just collect their eggs in order to appease their natural curiosity. Now if they were members of the J.B.R.C. their interest would be of great value to others, as well as to the birds themselves.

Bird-watching, as a hobby, is really fascinating, because, instead of just collecting or constructing something, you actually watch an unknown world unfolding before you, as well as collecting information, bird lists, and wet feet.

Yes, wet feet are often the bird-watcher's lot, because birds not only frequent the beautiful countryside, but the marshlands, too. Incidentally, the marshes, with which this country abound, have quite a beauty of their own. There is a great satisfaction when, on a cold misty morning, one stands up to the ankles in water for an hour, and catches a glimpse of a bird seen in the area very rarely.

It may seem a bit rough, but try it some time. Bird-watchers are a hardy crowd. I'm afraid it is no hobby for the 'namby-pamby' or the 'chicken-hearted', as is shown quite clearly by an article that appeared in an edition of the

'Junior Bird Watcher'. The article was about bird-watching on Foula, a Shetland island, ably written by Richard Oswald. The first paragraph of the article read . . .

'After sailing for three hours on a 35 ft. mail-boat across eighteen miles of the stormiest ocean in the Northern Hemisphere, we set foot on Foula. I was a member of the Barthay Exploration Group Expedition under the leadership of Mr Bob Dickens of the Yorkshire Naturalists' Union, and we were to camp for ten days on this lonely outpost of the British Isles: a remote outcrop of rock, with its high cliffs and shadowy peaks, it looks like a huge shipwreck anchored far beyond the talons of civilization. And, yet some fifty people live on this island barely six square miles in area: they are a typical island community and, in spite of the shadow of evacuation which hangs over them, are very cheerful and hospitable. Their only contacts with the 'mainland' are a radio-telephone, and the mail-boat 'Island Lass'. In the winter months, when the weather is hard, the boat is often unable to make its scheduled weekly trip for stores.

So you see bird-watching trips are often made under exacting conditions, and only the toughest survive. Of course, there is no 'close season', so that the hard winter months are compensated by the comfortable conditions of summer.

It is indeed worth considering joining the J.B.R.C. The address to write to is: The Secretary, R.S.P.B., 25 Eccleston Square, London, S.W.1.

Incidentally, anyone over the age of eighteen can join the Royal Society for the Protection of Birds. (R.A.)

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Last year 127,334 people under 21 (as well as some 70,000 older folk) went youth hostelling. Every week-end and throughout the summer, thousands of these hostellers were enjoying themselves exploring the countryside, taking photographs, bird-watching, clambering over castle ruins, visiting historic buildings, or just walking, cycling, or canoeing for the sheer fun of it.

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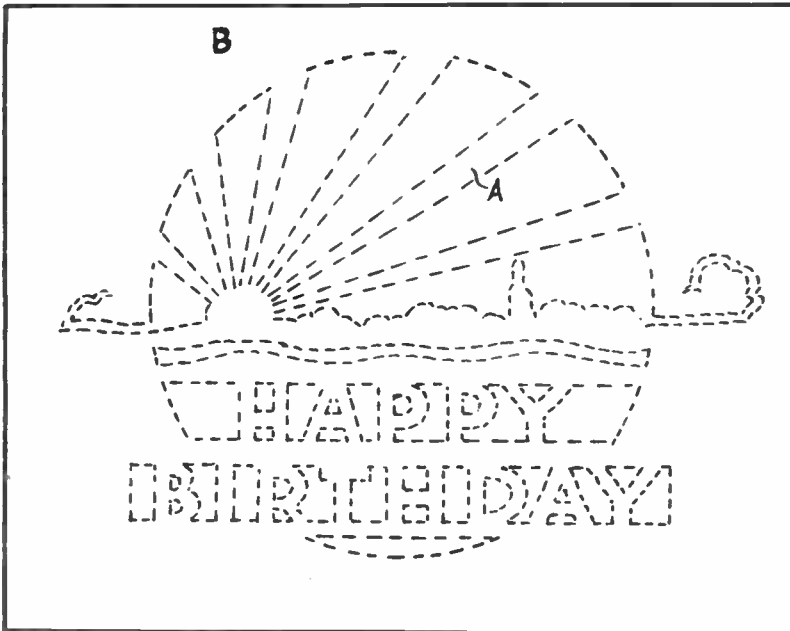
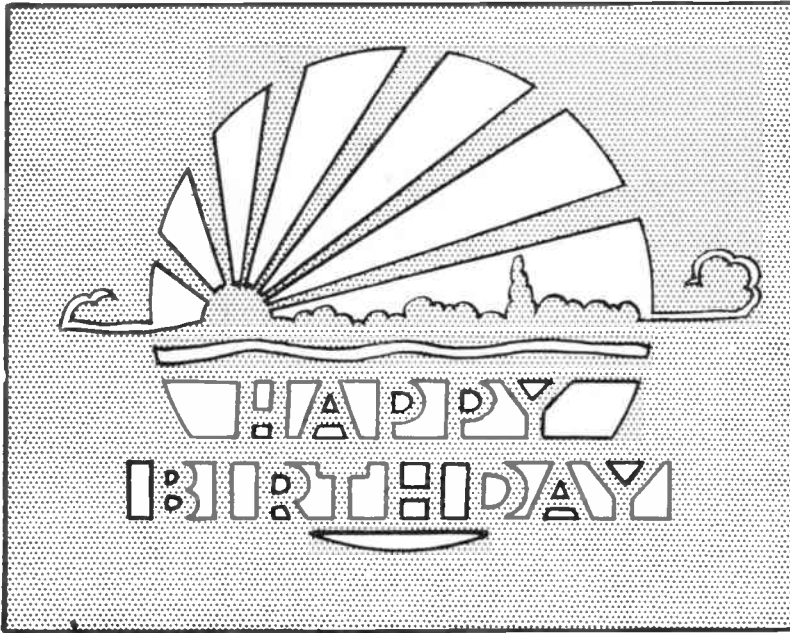
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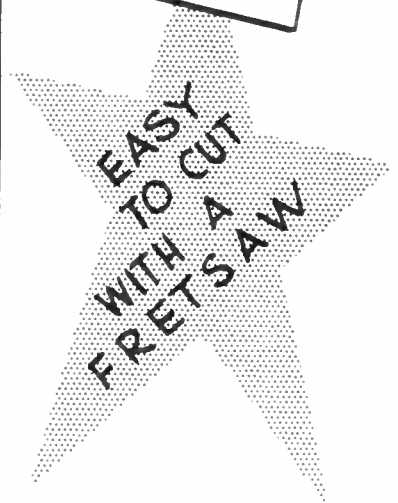
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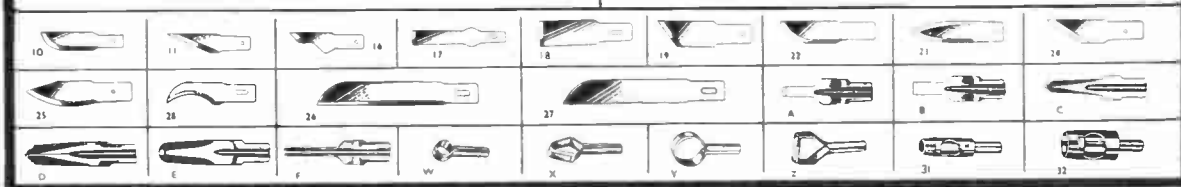
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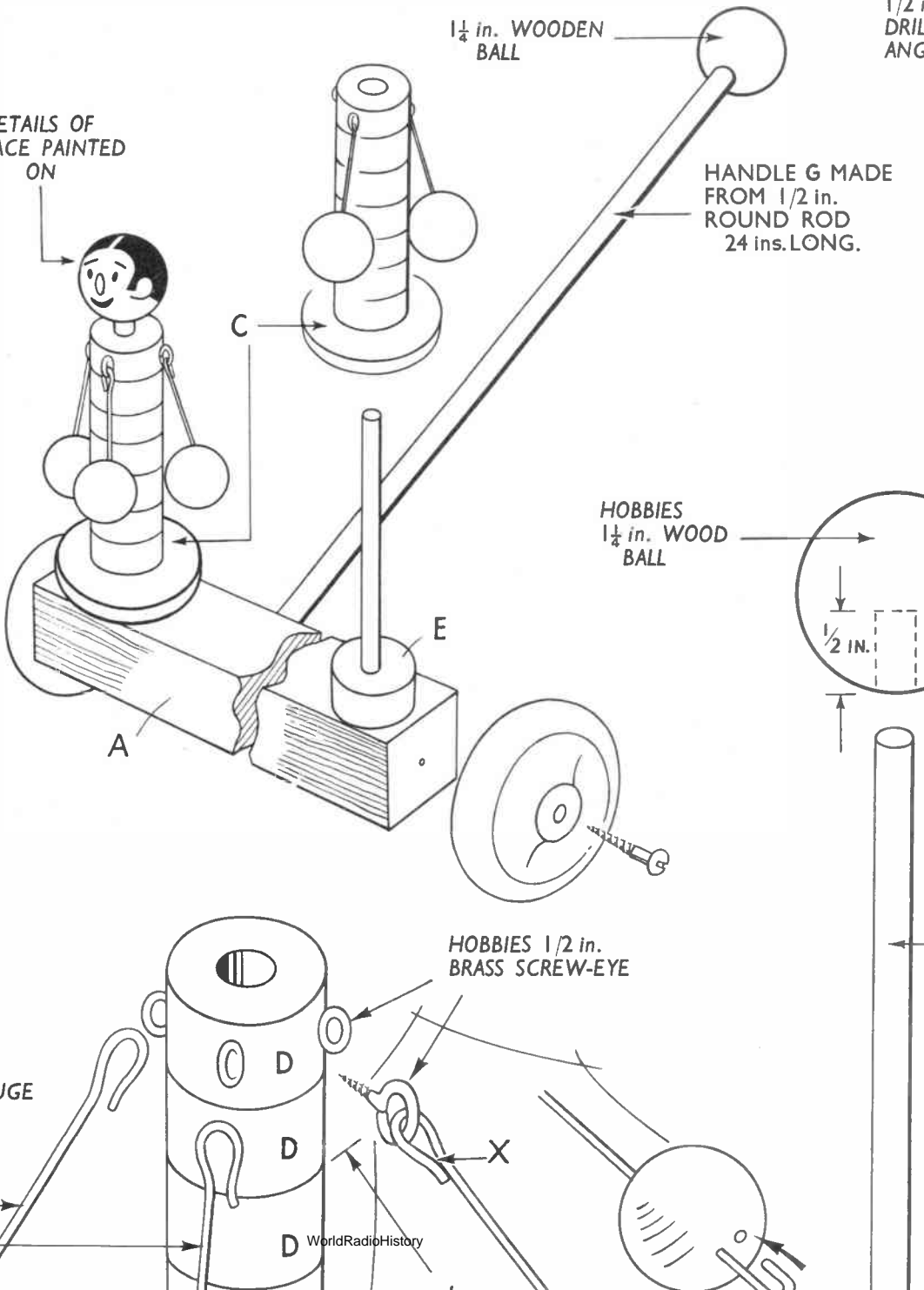
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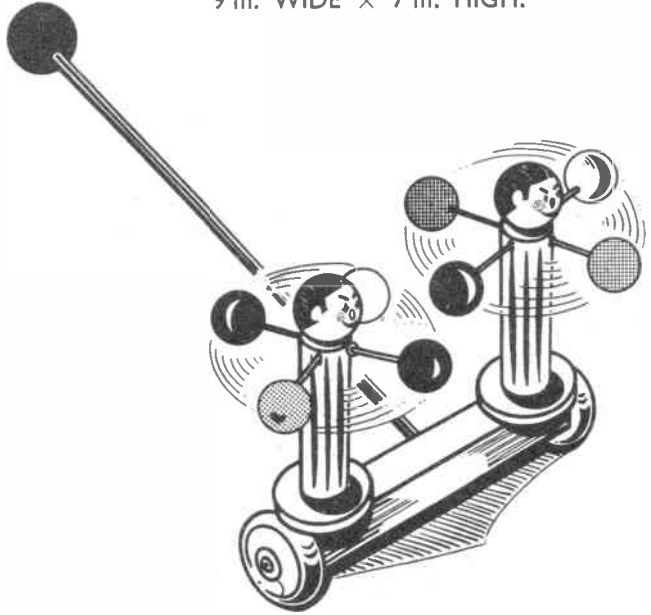
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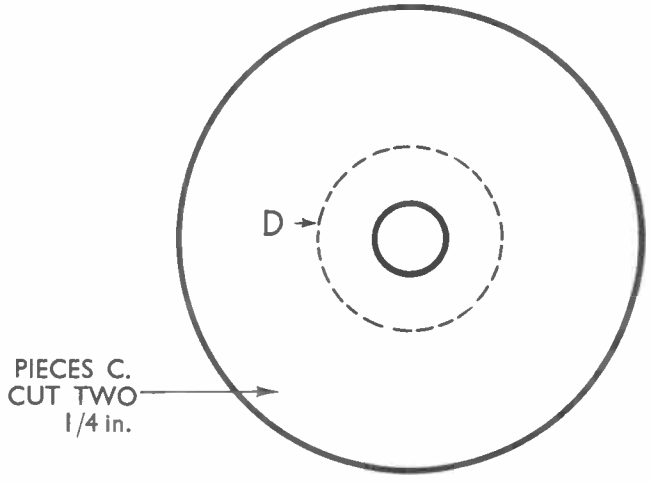
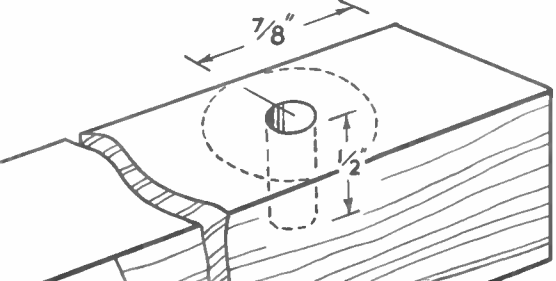
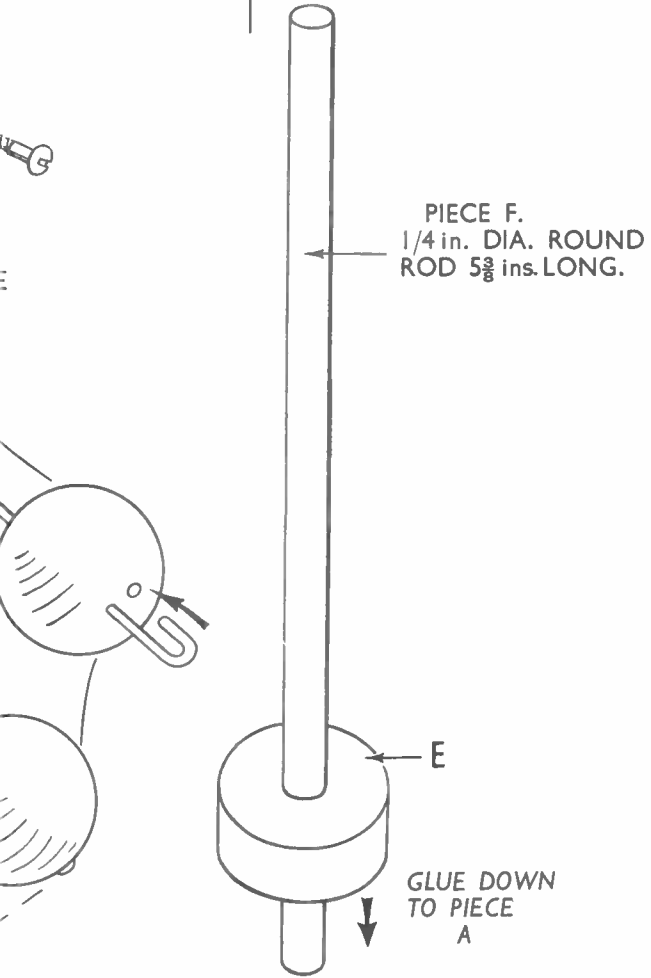
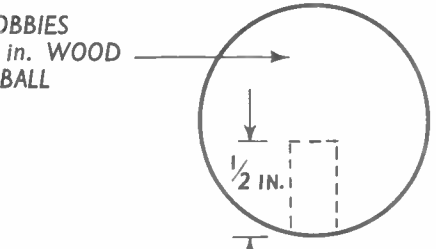
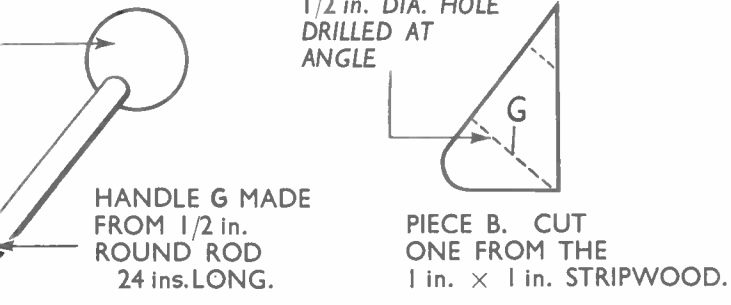
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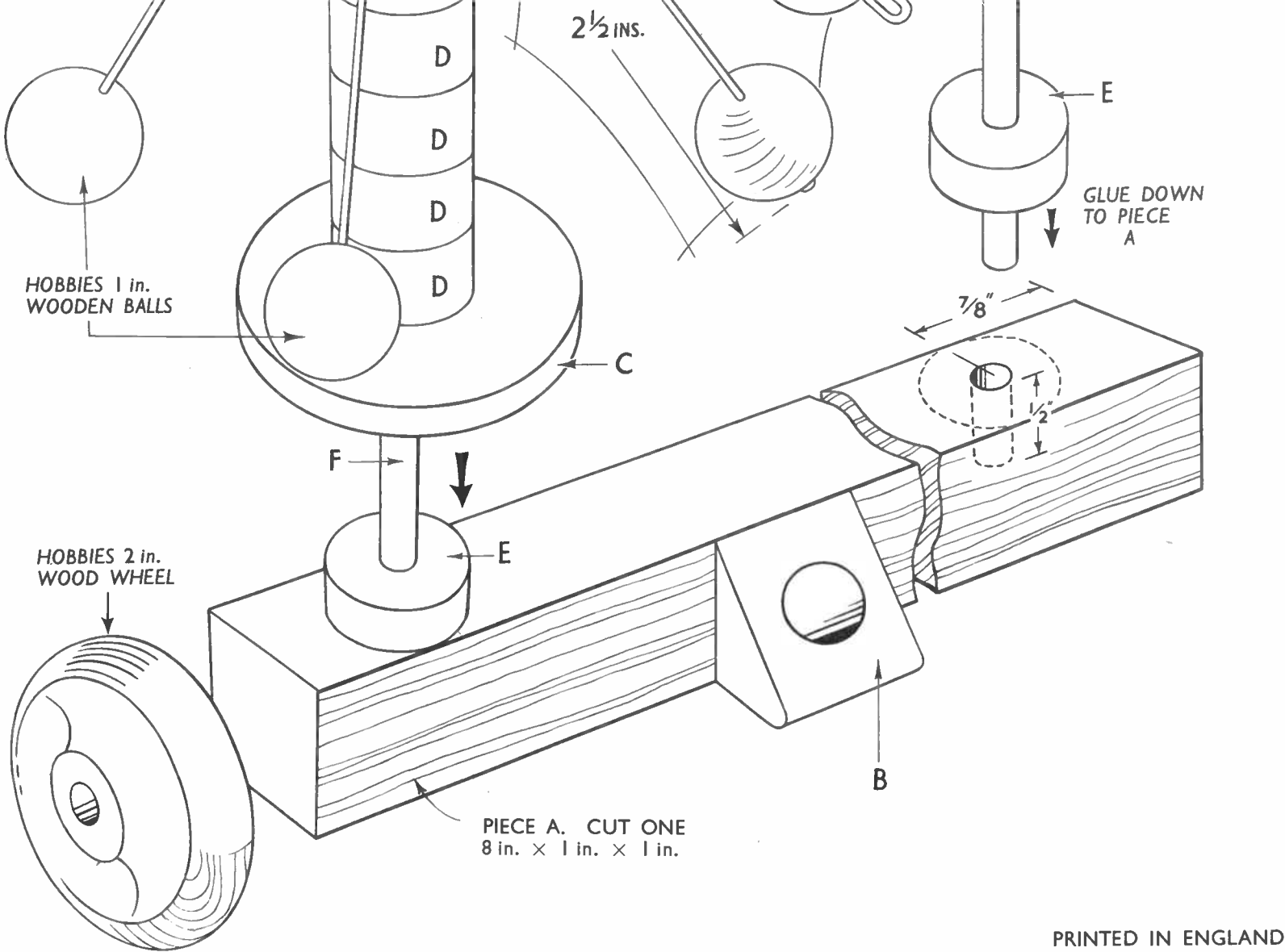
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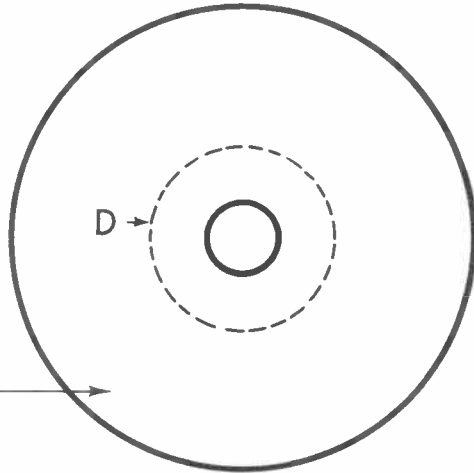
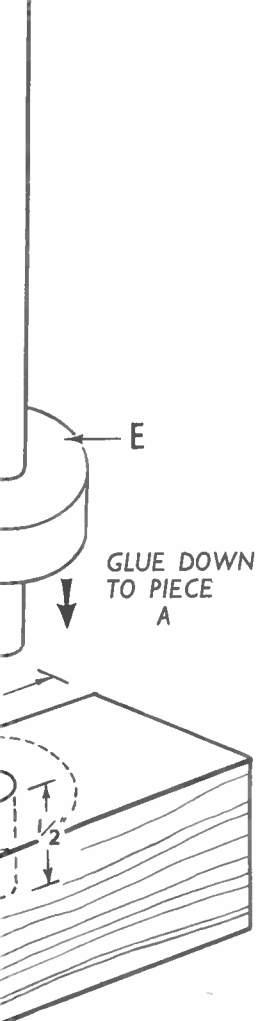
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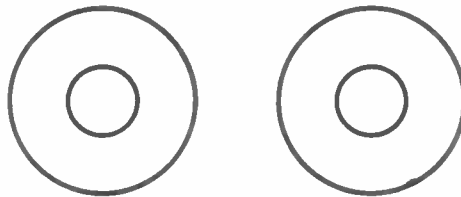
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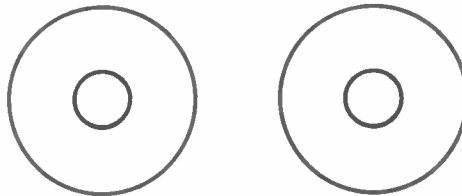
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