31st AUGUST 1960 VOL. 130 NUMBER 3377

THE ORIGINAL 'DO-IT-YOURSELF' MAGAZINE

HOBBIES weekly

FOR ALL HOME CRAFTSMEN

Instructions for making . . .

CHILD'S ROCKING CHAIR

Will keep a youngster amused for hours

Also in this issue:

RADIO 1-VALVER CIRCUITS

'COSY-CORNER' GARDEN SEAT

COLLECTORS' CLUB

CHEMISTRY

GARDENING HINTS

DESIGN FOR A COSMETIC TRAY

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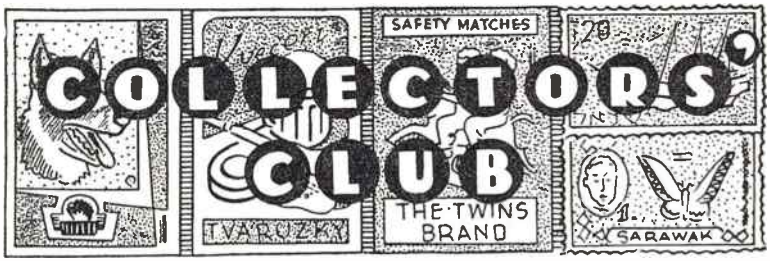


WHEN the Romans came to Britain 2,000 years ago and built their military roads, staging-posts were erected along the route to provide rest and refreshment and a change of horses.

The Roman staging-posts could well have been our first English inns. But it was the Saxons (who followed the Romans) who really popularized beer-drinking in England where, for seven or eight centuries that followed, the monasteries were the chief centres of brewing. Although in the early mediaeval period beer was being brewed in almost every large household, it had always been an essential activity in every monastery.

EARLY INNS AND HOSTELS

Each of these monastic breweries produced its own particular types of beer, that for the monks themselves and for their special guests being a strong beer made from barley, a gallon a day per head being the very liberal ration! The beer for the lowly pilgrims and the poor was of much inferior quality, being often brewed from oats, a crop that was in abundant supply. By that time hops were in general use for bittering and all beer was slightly 'hopped'.

Hostels for the pilgrims were invariably provided by the monastery and these 'Church Houses' for the refreshment of worshippers later became, in many cases, the village inns. Thus it is no mere accident that finds the parish church and the oldest 'pub' near neighbours!

Unfortunately little is known concerning Saxon inns. But they certainly existed, and in such numbers as to warrant decrees for their better ordering, first by Ethelbert, England's earliest law-maker (A.D. 560–616), and later by Ini, King of Wessex (A.D. 688–726).

Records of individual inns earlier than the fourteenth or fifteenth centuries are virtually non-existent and this fact makes it almost impossible to justify the claim that any particular one is the oldest in the land.

But no other inn can boast such historic cellars as those beneath the Mail Coach Inn at York. These came to light in 1930 when the inn was being rebuilt and are unique as being the only survival of a Roman bath within a fortress.

There have, of course, been several discoveries of Roman baths in domestic or civilian buildings but this is the only known example of a bath in a legionary fortress, whether in Britain, Gaul, or any other Roman settlement. It was not of the 'soap-and-water' variety but what we would nowadays class as a 'Turkish' bath.

This unique relic of the Roman occupation of York, 2,000 years ago, is there for all to see. So when in York call in at the Mail Coach Inn in St. Sampson's Square — on the corner of the quaintly named Mucky Peg Lane, to be exact — and see it for yourself.

Who would be bold enough to give a date to the Hawle-In-The-Ponds — the old Queen's Head Hotel, Pond Hill, Sheffield? It is acknowledged by antiquaries to be the oldest domestic building in Sheffield — the city that even in Chaucer's day was noted for its 'thwitels' or knives.

The earliest documentary mention of it dates back to 1582 but there are features of the structure which justify the claim that it is fourteenth century or earlier. Admittedly it was known as 'Mary Queen of Scots' wash-house' before it was an inn, but what matter?

(R.L.C.)

PEN FRIENDS

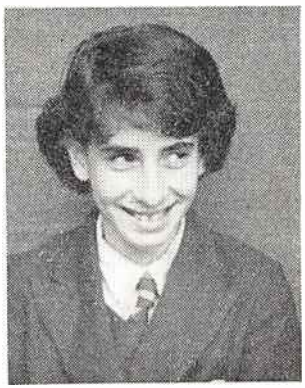
JOHN RUSSELL of 'Clesh House', Moneydarabeg, Annalong, Newry, Co. Down, N. Ireland, writes:

'I am a regular reader of *Hobbies Weekly*, and I must tell you that it is the best 5d. worth that any craftsman can buy.'

John is 22 years of age. His hobbies are photography, tape recording, radio, music, match labels, and stamp collecting. He would like pen friends throughout the world.

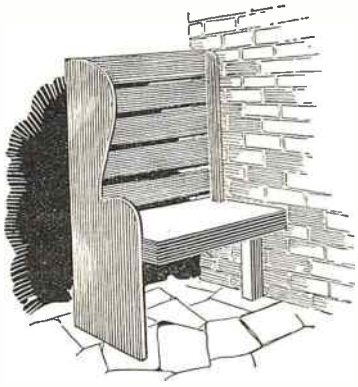
Charles Fiala of Tr. S.N.B.19, Prague 13, Czechoslovakia, has match, beer, and hotel labels for exchange.

Linda Rock writes: 'Can you find some pen friends for my sister? Her name is Silvana. She is thirteen years of age'. Write to: 30 Passmore Street, Westminster, London, S.W.1.



SILVANA ROCK

THE 'COSY-CORNER' GARDEN SEAT



FOR the few minutes rest from gardening, or a laze in the sun, this corner seat is ideal. It is attached to the house or garage, facing south if possible, so that it catches the warmth of the sun during autumn or spring. Plant shrubs at the back to provide a shield from the wind and you will always have a cosy corner in which to relax.

The size of the seat is not important, but suggested measurements are indicated for your guidance, in the front and side views in Fig. 1. The side A may be cut from a ¾ in. or 1 in. plank of wood, or from two pieces butted and glued together, using waterproof glue. If you cannot draw out the side direct on to the wood you can 'square up' the shape on a piece of paper first. The squares shown in Fig. 2 should be enlarged to 2 in. and the shape drawn in, one square at a time.

The backrest consists of two uprights B of ¾ in. by 1½ in. wood, and five pieces C of ¾ in. wood 6 in. wide. The pieces C are spaced out and nailed in position as shown in Fig 3.

The seat consists of a frame made from two pieces D and two pieces E all of ¾ in. wood. This frame is covered with ¼ in. marine plywood or by ½ in. boards butted together to make the appropriate width. The two supports G are of 2 in. square wood shaped to fit pieces D as shown by the inset diagram (Fig. 4).

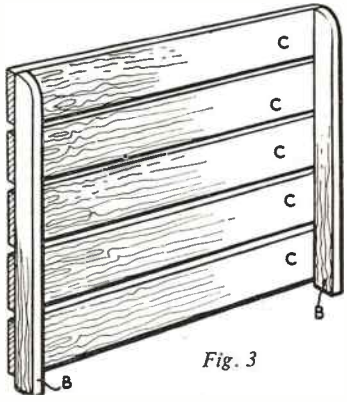


Fig. 3

To assemble, the seat and supports G are fixed to the wall by means of screws through G. Rawlplugs should be used for fixing. Next Rawlplug the backrest in position and finally fix the side A. The three units fixed together in this way will be rigid and firm if properly made.

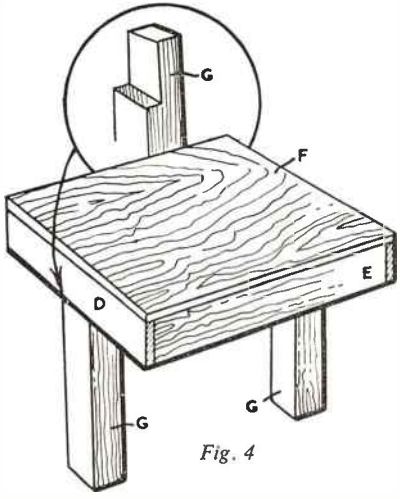
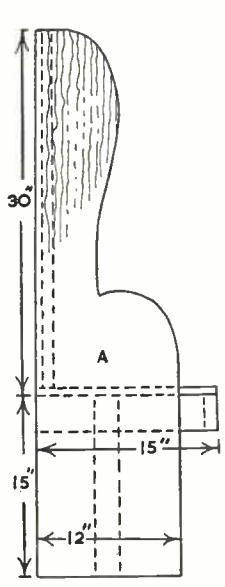
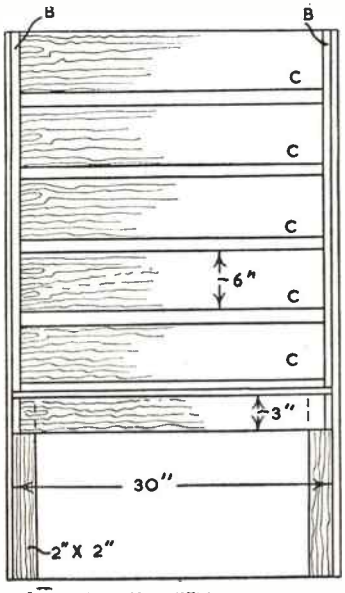


Fig. 4

A seat of this type looks best if painted. The wood should be rubbed down, filled, and given a coat of priming paint before carrying on with the under coat and finishing coats. The colour should harmonize with the exterior decoration of the house. (M.h.)



SIDE VIEW



FRONT VIEW

Fig. 1

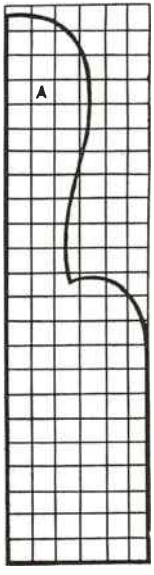


Fig. 2

CHEMISTRY AT HOME

COPPER SULPHATE EXPERIMENTS—2

THOUGH copper sulphate, $CuSO_4 . 5H_2O$, and those two other common copper salts copper nitrate, $Cu(NO_3)_2 . 3H_2O$, and copper chloride, $CuCl_2 . 2H_2O$, are easily soluble in water, many other copper salts are not. The soluble and insoluble salts do share one property, however, in that they are generally blue. The gradations of shade of these insoluble blue salts has naturally, drawn attention to their use as pigments, and some have been so used.

Copper silicate is an example. It is easily prepared by mixing copper sulphate and water-glass solutions. Water-glass is a mixture of sodium silicates, and so no one formula can be assigned to it. The same holds good for the mixture of copper silicates produced from it.

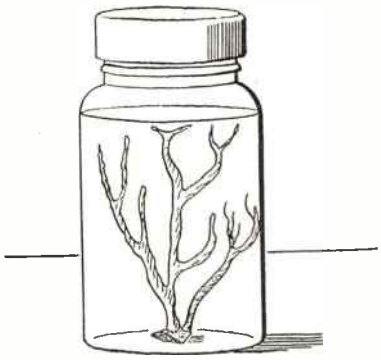


Fig. 1—Chemical coral

Dissolve 10 grams of copper sulphate in 100 c.c. of warm water and add a solution of water-glass until the mixture is shown to be alkaline by a drop of it turning red litmus paper blue. A bulky pale blue precipitate of the mixed copper silicate forms during the addition of the water-glass.

Soluble sodium sulphate, Na_2SO_4, is also formed in the reaction and this must now be washed out. Since the precipitate is so bulky, washing on the filter is inconvenient unless you have a large funnel and paper. Washing by decantation in a large bottle fitted with a siphon is better. When one wash water gives no white precipitate of lead sulphate, $PbSO_4$, with lead acetate solution, $(CH_3 . COO)_2Pb . 3H_2O$, in accordance with the reaction:

$$Na_2SO_4 + (CH_3 . COO)_2Pb = PbSO_4 + 2CH_3 . COONa,$$

filter off the copper silicate and dry it in a not too hot oven.

It shrinks somewhat during the drying and yields a pigment of a fine pale blue colour.

This substance may also be produced in a blue coral-like form. Dissolve some water-glass in twice its volume of warm water and let the solution cool. Nearly fill a bottle with it and drop in a crystal of copper sulphate. Soon, blue filaments of copper silicate sprout from the crystal and eventually form an impressive growth (Fig. 1). The watching of this growth yields a pleasant family entertainment. By closing the bottle tightly with the screw cap the growth can be preserved as an ornament for some time, provided it is not jarred, for the growth is fragile.

Another copper pigment, known under the name of Hatchett's Brown, is copper ferrocyanide, $Cu_2Fe(CN)_6$, formed by precipitation from copper sulphate and potassium ferrocyanide, $K_4Fe(CN)_6 . 3H_2O$:

$$2CuSO_4 + K_4Fe(CN)_6 = Cu_2Fe(CN)_6 + 2K_2SO_4 .$$

Dissolve 16·3 grams of copper sulphate in 170 c.c. of warm water and 13·7 grams of potassium ferrocyanide in 50 c.c. of warm water. Stir the potassium ferrocyanide solution into the copper sulphate solution. A brown gelatinous precipitate of copper ferrocyanide forms and the mixture becomes almost solid.

Continue stirring for a few moments. The mixture thins and on standing a few minutes the gelatinous precipitate changes to a powdery form. The soluble potassium sulphate, K_2SO_4, which is also formed in the reaction may now be removed by washing by decantation in a large bottle fitted with a siphon. When one wash water indicates absence of sulphate by a few c.c. giving no white precipitate with lead acetate solution, filter off the purified copper ferrocyanide and allow it to dry.

By grinding and sifting it you will have a pigment of a fine brown colour with a tinge of purple.

It may also be produced on cotton as a mineral dye. Immerse a small piece of white cotton in copper sulphate solution until it is thoroughly wetted, remove it, and wring it evenly. By now stirring it in some potassium ferrocyanide solution the brown colour is imparted to the cotton. Wring out the cotton, rinse it in water, and let it dry.

If you try stirring a solution of 8·33 grams of copper sulphate in 50 c.c. of hot water into a solution of 12·73 grams of sodium tetraborate (borax), $Na_2B_4O_7 . 10H_2O$, in 1 litre of cold water, you will find a voluminous blue precipitate forms. This should be copper tetraborate, CuB_4O_7, formed thus:

$$CuSO_4 + Na_2B_4O_7 = CuB_4O_7 + Na_2SO_4,$$

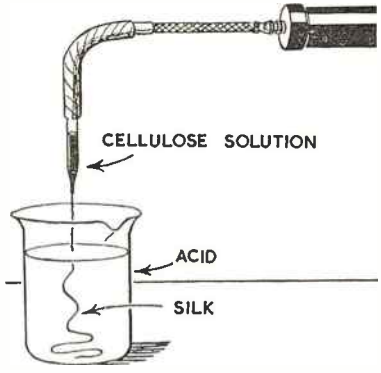


Fig. 2—Making artificial silk

but the reaction is much more complex and gives mixtures of copper borates. Hence, here again chemists assign no one formula because the product is a mixture.

The soluble sodium sulphate should now be washed out by decantation and the wash waters tested for absence of sulphate as in the purification of copper ferrocyanide. Filter off the bulky precipitate and spread it in thin layers to dry. It often dries out to a dark blue-green mass giving a glassy fracture. Powder the product, and a splendid blue-green pigment results, not unlike the bluer forms of chromium sesquioxide (chrome green), Cr_2O_3.

Copper sulphate was the starting point for an early form of artificial silk. Copper hydroxide, $Cu(OH)_2$, is first prepared by precipitation from copper sulphate solution by means of sodium hydroxide, NaOH:

$$CuSO_4 + 2NaOH = Cu(OH)_2 + Na_2SO_4 .$$

● **Continued on page 381**

SEPTEMBER

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

IT is said that if you keep the weeds down during the months of May and September you go a long way towards maintaining a clean garden. Certainly the weather during these months is usually conducive to rapid growth and although the hoe should be kept going during September, weeds should be removed to the compost heap.

Outside

REMOVE dead flowers to encourage blooming. Take cuttings of geraniums, violas, fuchsias, heliotropes, penstemon etc. Continue to tie up, disbud and feed dahlias and chrysanthemums. Tie in new shoots of climbing roses. Layers of carnation which have rooted may now be lifted and planted. Gladioli which have finished flowering may be lifted and dried off for storing.

New lawns should be made from seed this month. Information for sowing, types of grass, fertilizers, etc, may be obtained from books from your local library.

ROCK GARDEN — Dianthus, arabis, cheiranthus, aubretia and many other attractive plants may be planted this month. Bulbs, too, may be planted for spring blooming. Catalogues will describe the varieties suitable for the rock garden. Many alpines may be lifted and divided this month.

FRUIT GARDEN — Clean up between soft fruit bushes. Prune side shoots off gooseberries and red currants. Prepare and fix grease bands. Tie in loganberries and raspberries not yet attended to. Plant strawberries that have been rooted in the pots. Cloche perpetual fruiting strawberries.

VEGETABLE GARDEN — Continue earthing up celery. Sow lettuces for cloching later. Plant spring cabbages. Clean up onion bed and bend tops over to assist ripening. Lift red beet, twist off the leaves and store in sand. Commence lifting potatoes as haulms die. Dry off and store in sacks or clamps. Cloche tomatoes by untying and laying down on straw.

Inside — warm house

CLEAN up foliage plants by syringing. Bring in plants that have been outside during the summer. A little heat may be needed this month particularly during cold nights. Make sure that glass is clean and free from shading. Get rid of dead blooms and foliage. Set traps for mice.

Cool house

CUCUMBERS and tomatoes may be cleared ready for the late flowering chrysanthemums. These should be brought in as weather becomes colder and frosts threaten. All plants should be sprayed and house well fumigated before housing plants. Give plenty of ventilation.

Begonias which have finished flowering should be given less water as foliage dies. Dry off eventually and store. Sow schizathus and double petunias for a spring display. Pot up bulbs for spring blooming.

Start reducing the amount of water given to cacti. By the end of the month many plants will be sprayed only. Small seedlings which are still growing may be watered for a few weeks yet. If in doubt — do not water.

Cold house

OCTOBER flowering chrysanthemums may be housed, or beds prepared for lettuces. Alpines may be safely wintered in a cold house and will give a grand display in the spring.

General

EVENINGS are quickly drawing in and every effort should be made to clear away weeds and rubbish. Odd corners should be cleaned up and slug bait used liberally. Be ready to protect tender shrubs at the first sign of frost.

(M.h.)

● **Continued from page 380**

Experiments with Copper Sulphate

Dissolve 25 grams of copper sulphate in 100 c.c. of water. Little by little stir in sodium hydroxide solution until a drop of the mixture turns red litmus paper blue and thus shows a slight excess of sodium hydroxide is present. Filter off the fine blue precipitate of copper hydroxide and wash well with water until it is shown to be free of sodium sulphate by the lead acetate test.

Put 20 c.c. of strong ammonium hydroxide, NH_4OH, into a beaker and stir in small quantities of the damp copper hydroxide until no more will dissolve. A deep blue solution results. Let the excess copper hydroxide settle and then either pour off the clear upper liquid or filter it through glass wool into a small screw-capped bottle fitted with a rubber disc within the cap.

This solution has the curious property of dissolving a substance which resists all the common solvents; namely cellulose, $(C_6H_{10}O_5)_n$. Paper and cotton are common forms of cellulose. Tear up a few filter papers into fine strips and add them to the blue solution, screw on the cap, and shake occasionally until the paper has dissolved.

Now add a drop of this solution to some dilute hydrochloric acid, HCl, in a test tube. The cellulose is precipitated. On this principle depends the production of the artificial silk known as cuprammonium silk.

Soften a piece of glass tubing in a flame and draw it out. Cut at the narrowest part, so as to produce a fine jet. Fit a short length of rubber tubing to the wide end and dip the glass tube in the cellulose solution, so that it is nearly filled.

Now attach the rubber tube to a bicycle pump and slowly squirt the solution into dilute hydrochloric acid (Fig. 2). The cellulose precipitates as a white thread and may be wound off on to a test tube to dry.

The unused damp copper hydroxide may, of course, be allowed to dry for your stock.

Simple Radio

TRY THIS 1-VALVER

By 'Radio Mech.'

QUITE a large number of stations can be received with a 1-valve set and headphones, and the cost of making up simple circuits of this kind is low. Single-valve receivers are also extremely economical to operate, because small batteries have a long working life. It is also easy to add one or more amplifying stages, later, so that the set will operate a loudspeaker.

A 1-valver tuning medium waves can use the circuit in Fig. 1. The ·0005mfd. condenser is for tuning, and an air-spaced type is most satisfactory. If it has a fairly large knob or dial, a reduction drive is not needed. A scale marked 0–100 or 0–180 can be fitted to the panel, so that the tuning position of various stations can be noted.

The ·0003mfd. variable condenser is for reaction, and has a knob so that it can be adjusted. This condenser is similar to a volume control, except that it is only closed just enough to bring the valve near the point where oscillation commences. (Turning it too far will cause whistles and weak reception.)

Other parts required are an on/off switch, small high frequency choke, ·0002mfd. fixed condenser, and 3 meg-ohm resistor. Phones of medium or high impedance type, which give good results with a crystal set, will do well for a 1-valver.

Ready-made coils can be used, or a coil can be wound as shown in Fig. 1. Using a Paxolin or dry cardboard tube about 1¼ in. in diameter, the coil can consist of 110 turns of 32 S.W.G. or similar enamelled wire. The coil begins at 1, the wire passing through small holes. After winding on 60 turns, the tapping point 2 is made. After a further 20 turns, tapping 3 is provided. Another 30 turns complete the coil, and ends at 4. Ends 1 and 4 are left long enough to reach the other parts in the receiver. Tappings 2 and 3 can be made by twisting a short loop in the wire, during winding.

The H.T. (High Tension) battery can be about 45V. to 67½V. Small batteries will last a very long time. For headphone reception there is no point in using a battery over about 60V. or 67½V.

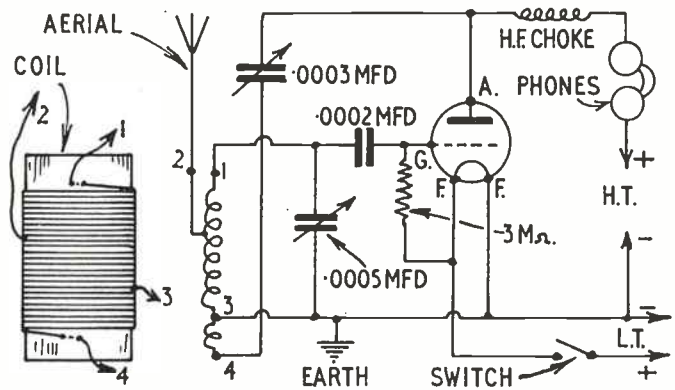


Fig. 1—A 1-valve medium-wave receiver

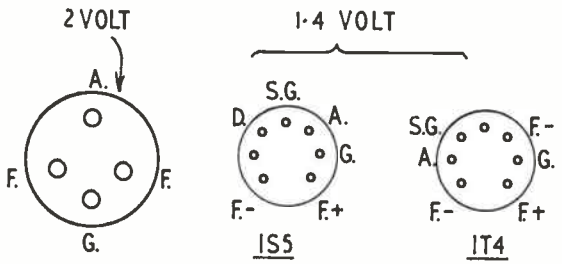


Fig. 2—Connections for detector valves

Valves to use

The older type of 2-volt triode, with four pins, will give very good results. Pin or holder connections for these are shown in Fig. 2. In both Fig. 1 and Fig. 2 'A' denotes Anode, 'G' shows the Grid, and 'F' indicates the Filament. These 2-volt valves were originally designed to receive filament current from a 2-volt accumulator. If an accumulator is not available, a 3-volt dry battery (2-cell) can be used instead, with a resistor in one battery lead to reduce the 3V. to 2V. Nearly all 2-volt detector valves take ·1 amp filament current, so a 10 ohm resistor should be used.

Fig. 2 also shows pin connections for 1S5 and 1T4 'all dry' valves, the valves or holders being viewed from below. These valves require a 1½V. filament supply, as obtained from a 1½V. dry battery, one dry cell, or a number of dry cells wired in parallel. Always use the correct filament voltage.

The 1·4V. valves have seven pins. With the 1S5, pin 3 is for a Diode. This is not used in the 1-valvers, so it is joined to pin 1 (Filament). There is also a Screen Grid (S.G.) pin. To use such valves in any circuit showing a triode, simply connect the S.G. pin to the Anode.

Note that these valves have positive and negative filament pins, and these should be connected to positive and negative on the L.T. supply. Some pins are not used, or are joined inside the valve, and these are simply left disconnected when wiring the valveholder.

Fig. 3 shows how the screen grid is joined to the anode, when using a screen grid valve as if it were a triode.

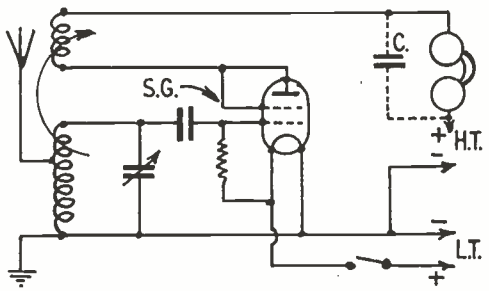


Fig. 3—Moving coil reaction

Moving coil reaction

This type of circuit needs no reaction condenser or H.F. Choke, and is shown in Fig. 3. Component values are the

same as in Fig. 1. Reaction is controlled by adjusting the coupling between one coil and the other, as shown by the curved arrow. The coils thus have to be on separate formers. This system was often used in old receivers, the reaction coil being hinged or pivoted so that it could be swung away from the other coil. A rod, with knob, can be used to adjust the position of the moving coil.

If the coils are wound on 2 in. or similar diameter formers, about 50 turns will do for tuning, with about 25 turns for reaction. An aerial tapping is made near the centre of the 50-turn winding.

The main advantage of this circuit is in the very few parts needed. With some phones, reaction is not effective, and a by-pass condenser C should then be wired across the phones. The actual capacity can be anything from about ·0003mfd. to ·01mfd.

Screen grid detector

Triodes to run from a 1½V. battery are no longer made, but a valve with a screen grid can be used as a triode, as explained.

as is the case with the tuning condenser.

A suitable coil is shown in Fig. 4. The winding from 1 to 3 can be 80 turns, as described for the coil in Fig. 1, with the tapping 2 about 60 turns from point 1. A ¼ in. space is then left, and the reaction winding, consisting of 30 turns between points 4 and 5, is put on. Note that both windings are in the same direction, and that lead 5 goes to the valve anode. If connections to one winding are reversed, the reaction circuit will not work.

In the circuits described, the reaction windings given will allow reaction to be obtained with a fairly low H.T. battery voltage. If a fairly high voltage is used, and reaction is very fierce, this can be corrected by removing some turns from the reaction winding.

The position of the aerial tapping (point 2) has also been given for average results. If an extremely short, poor aerial is used, the tapping can be omitted. The aerial is then taken to point 1. If the aerial is at all long, however, the tapping is best used as described, or tuning will be unselective.

An interesting type of detector is shown in Fig. 5. Negative bias is applied to the valve grid through the tuning coil. As a result, a much more powerful output is obtained, if the signal obtained from the aerial is good. Unfortunately, this type of detection does not give good results with weak signals. It is thus best for powerful reception of local stations. Due to the manner in which the circuit works, it is also termed 'anode bend' detection.

Bias detector

The bias used will normally be about 3V. to 9V. and should be obtained from a tapped battery. The best value of bias depends on the valve, and H.T. voltage, and can be found by moving the plugs in the grid bias battery. Note that G.B. positive goes to the earth line.

With a good aerial and earth, the circuit can provide reasonable loudspeaker reception. To help achieve this, the aerial is taken directly to point 1, as explained. If a speaker is to be used, a power pentode, and 120V. H.T. battery

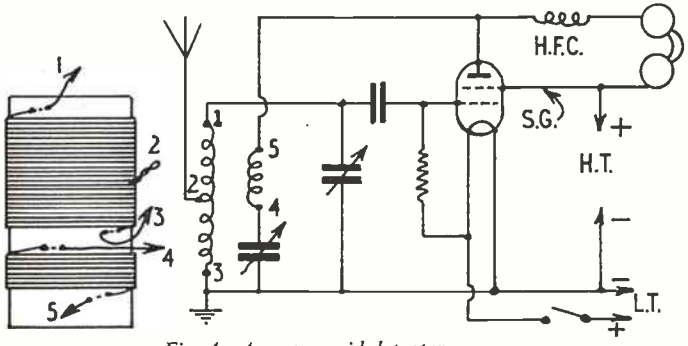


Fig. 4—A screen grid detector

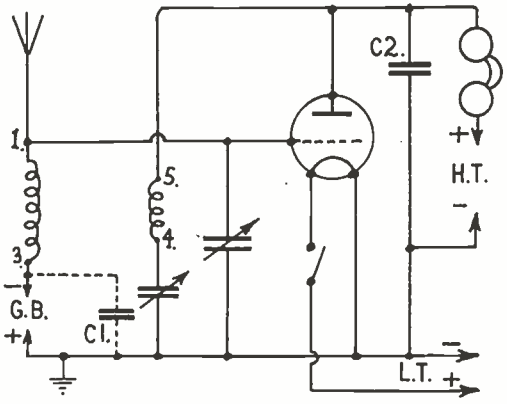


Fig. 5—A bias detector

It is also possible to use the screen grid in the normal way, by wiring it to H.T. positive, as in Fig. 4. If the phones are of good impedance, the valve will then give more amplification, so that signals are louder.

The reaction circuits shown in Fig. 1 and Fig. 3 may be used with a screen grid valve as detector. When using the coil shown in Fig. 1, the reaction condenser spindle is connected to point 4. This means that a metal panel cannot be used, unless the condenser is insulated from it.

To overcome this, the reaction winding can be made entirely separate from the tuned part of the winding, as shown in Fig. 4. The condenser can then be connected between the coil and earth, and its spindle is joined to the earth line, exactly

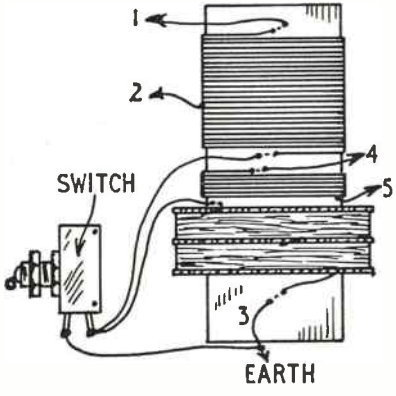


Fig. 6—A 2-band tuning coil

will give best volume. This type of valve will have a screen grid, and this is wired to H.T. positive, exactly as in Fig. 4.

Smooth reaction is difficult to obtain with an anode bend detector, and this also makes it unsuitable for long distance reception. Reaction depends somewhat on the value of the by-pass condenser C2, which can usually be about ·001mfd. Condenser C1 is only needed when the grid bias battery is aged, and it can be from about ·001mfd. to ·1mfd.

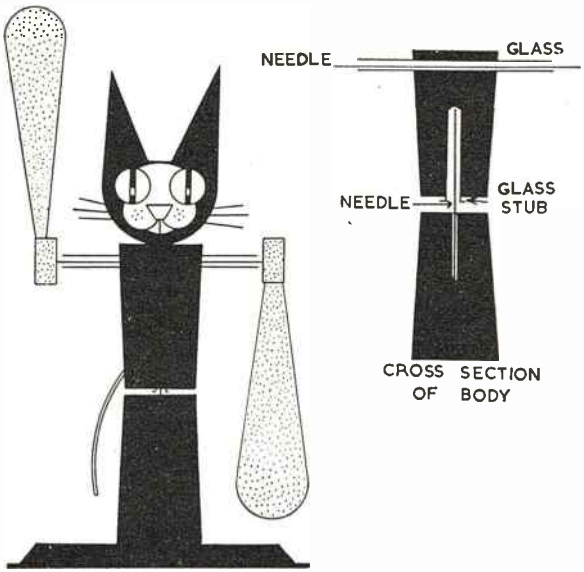
As this type of detector is insensitive to weak signals, it is less likely to suffer interference. This is worth remembering, if really good phone reception of local stations is most important.

● **Continued on page 384**

Zephyr the Wind Cat

THE crazy antics of the wind are never dull. It is a pleasure to watch the great bending motions of trees, or the wild pirouettings of dry leaves over the road. Zephyr, the Wind Cat, is a cheerful wind toy that will turn its body and whirl about its big arms in the lightest breeze.

A base for the toy is quickly fashioned by neatly fixing a long thin cork to a coffee tin lid by means of a large screw. One and a half inches will be a good length for the cork. First, bore a hole to take the screw in the centre of the lid. When you are satisfied that the base is quite firm, erect the pointed end of a darning needle, pointing vertically upwards, by pressing the eye of the needle deep into the middle of the cork. About an inch of the needle should protrude.



Make the body of the cat from a cork similar to the one you used to form the base. You must prepare two short lengths of glass tubing to provide low friction mountings for the body pivot and the arm spindle. Heat seal one end of a 1 in. length of very thin glass tubing by holding the end of the tube in the top of a hot Bunsen flame while you gently twist the glass between your fingers. This little tube will serve as the body pivot mount. Make the arm spindle mount by holding each end, in turn, of a 2 in. length of the same glass tubing in the top of a hot Bunsen flame, until the rough edges of the ends of the tubing have become rounded and smooth.

Use a red-hot nail or a cork borer to make holes in the second cork, into which the glass mounts can be inserted. Bore a hole almost 1 in. deep into the middle of the smaller end of the cork, for the body pivot. Bore another hole, near the opposite end of the cork, which will pass horizontally across the middle and through which the arm spindle mount can be inserted and firmly held in place. Fix the glass mounts in position, as shown in the diagram. Mount the body upon the needle pivot on the base and notice how freely it will spin when you give it a slight push. Cut a $\frac{1}{4}$ in. thick slice off a $\frac{3}{4}$ in. diameter cork and secure this to the 'shoulders' of your toy, using balsa cement, to form a rough head.

Select a $2\frac{3}{4}$ in. long darning needle to serve as an arm spindle. Insert this through the arm spindle mount and impale a $\frac{1}{4}$ in. thick slice cut off a $\frac{1}{2}$ in. diameter cork upon each end of the spindle. With the corks in place the spindle should be able to spin easily. Next, make a pair of bat-shaped arms out of $\frac{1}{8}$ in. thick sheet balsa wood. Let these be $2\frac{1}{2}$ in. long and let them be $\frac{3}{4}$ in. broad at their widest parts. Mark upon the wood in pencil and cut out the shapes with a razor blade or balsa cutting tool. Now, care must be taken to fit the arms in their proper positions. Fix the left arm so that its surface faces forward, and fix the right arm so that its surface faces obliquely forward with its plane about 45 degrees to the plane of the left arm.

Fit the arm 'blades' into slots cut in the small corks at the ends of the arm spindle. Balsa cement will hold them firmly in place. Place your toy near an open window, where it can be blown by the breeze, and watch the body spin and the arm blades whirl around. Make any necessary adjustments. Paint the base, body and head jet black and colour the arms bright red. If you are not an artist cut out a saucy cat's face from a comic and glue it upon the head. It is also fun to glue tiny pictures of birds or mice upon the arms but do not spoil the balance or make the arms too heavy.

Stand Zephyr, the Wind Cat, where his amusing actions will be best appreciated, near a window in a child's room, but beware of too strong winds which may damage your delicate toy.

(A.E.W.)

● **Continued from page 383**

RADIO 1-VALVER

The circuits described have shown coils for medium wave only, but a dual-range or 2-band coil can be used instead, to permit long-wave reception as well.

A coil which can be wound on a $1\frac{1}{4}$ in. diameter former about 3 in. long is shown in Fig. 6. Winding begins at point 1, 60 turns of 32 S.W.G. enamelled wire being wound on side by side. Tapping 2 is then made, and a further 20 turns are wound on. The 32 S.W.G. wire is then cut, and the end secured by passing it through small holes.

A space of about $\frac{1}{8}$ in. is left, and some 36 S.W.G. enamelled wire is anchored, to form connection 4. The reaction coil, consisting of 60 turns, is then wound. Turns are side by side, and the 36 S.W.G. wire is cut and anchored at point 5.

Three strong cardboard discs are cut, so that they are a tight push fit on the tube. The first is against the reaction coil, and $\frac{1}{4}$ in. spaces are left between washers or discs, as the others are placed on. This gives two deep spaces, for the long-wave winding. This winding begins near the reaction coil, and consists of 130 turns in the space between first and second washers, and 120 turns in the remaining space, the wire being terminated at point 3. For this part of the coil, 32 S.W.G. cotton-covered wire is most convenient. The card washers are not essential, but without them it is very difficult to keep the large number of turns required for the L.W. portion in position.

The coil is connected up as for the one shown in Fig. 4. That is, 1 to fixed plates of tuning condenser, 2 to aerial, 3 to earth, 4 to reaction condenser, and 5 to anode. The ends of the M.W. section and L.W. section are then joined, as shown in Fig. 6, and taken to a switch. The remaining switch tag goes to earth. The switch is closed to tune medium waves, and opened to allow long-wave reception.

ROCKING CHAIR FOR A CHILD

YOUNGSTERS will spend hours of enjoyment in this easily-made rocker. It is intended for the tiny tots, but could be increased in size for children up to six or seven.

The exact shape is not important, but should be on the lines shown in Fig. 1. The overall length is 32 in. and the depth of the sides (G) about 10 in. These may be drawn out on a sheet of paper first before transferring to ¾ in. plywood. The approximate positions of seat, footrest, etc, should be marked at the same time.

Cut the seat, pieces A and B, from ¾ in. wood and pin together, as shown in Fig. 2. Add glue and allow to dry. This will ensure a stronger glued joint when finally assembling.

The handle is made from two pieces of ¾ in. wood (C), 7 in. by 2 in., and a piece of 1 in. diameter round rod (D), as indicated in Fig. 3. The pieces C are rounded at the top, and the round rod is secured by glue and countersunk screws.

The footrest F is of ¾ in. wood, 16 in. long and 2 in. wide, and the two ends E of 1 in. diameter round rod 16 in. long. All parts are assembled as in Fig. 4. Each piece is secured by gluing and screwing.

Clean up thoroughly and paint. Remember to fill the grain before applying the undercoat. (M.h)

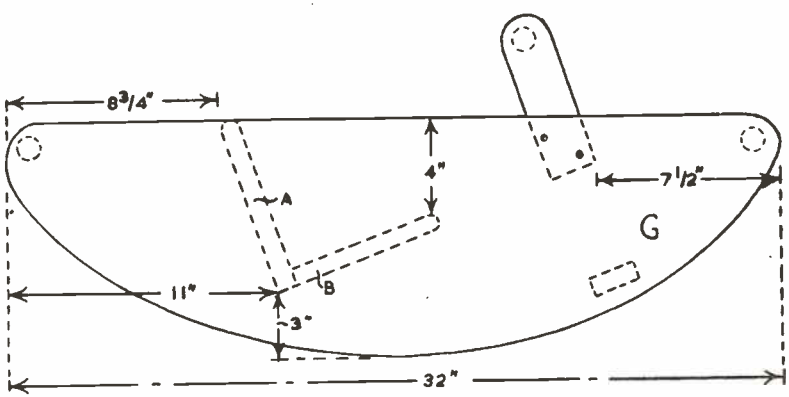


Fig. 1

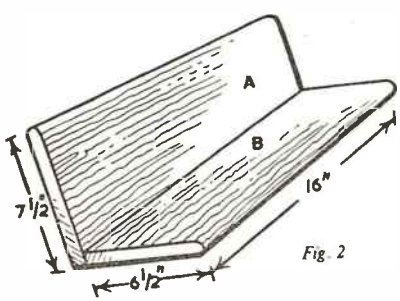


Fig. 2

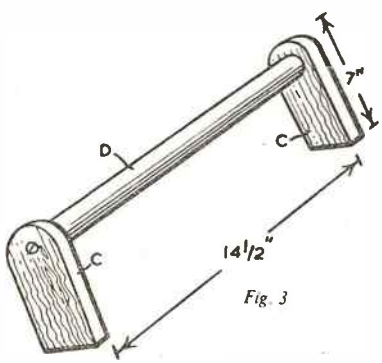


Fig. 3

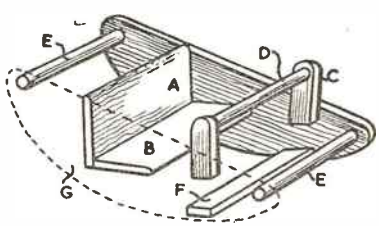
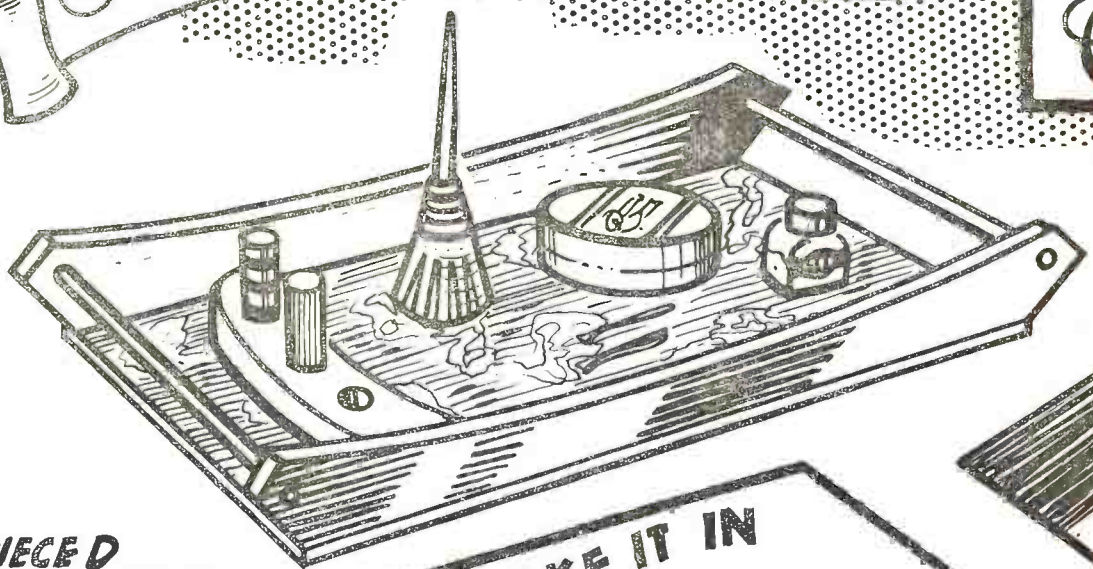


Fig. 4

"For Your Fair Lady"



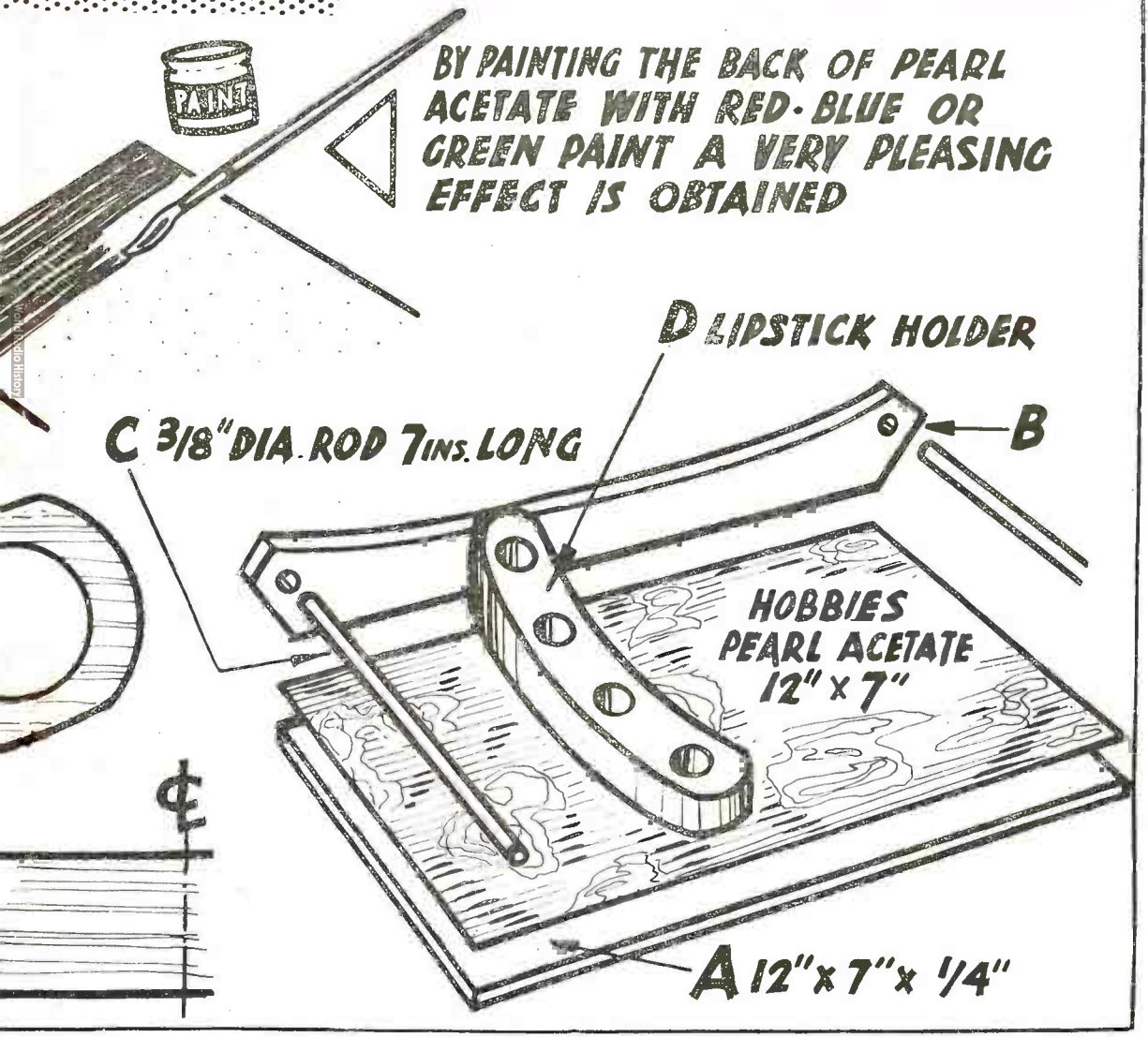
MAKE IT IN 1 EVENING

PIECE D
CUT ONE 1/2"

PIECES B. (HALF ONLY SHOWN)
CUT TWO 1/4"

Decorative

Cosmetic Tray



Mainly for Modellers

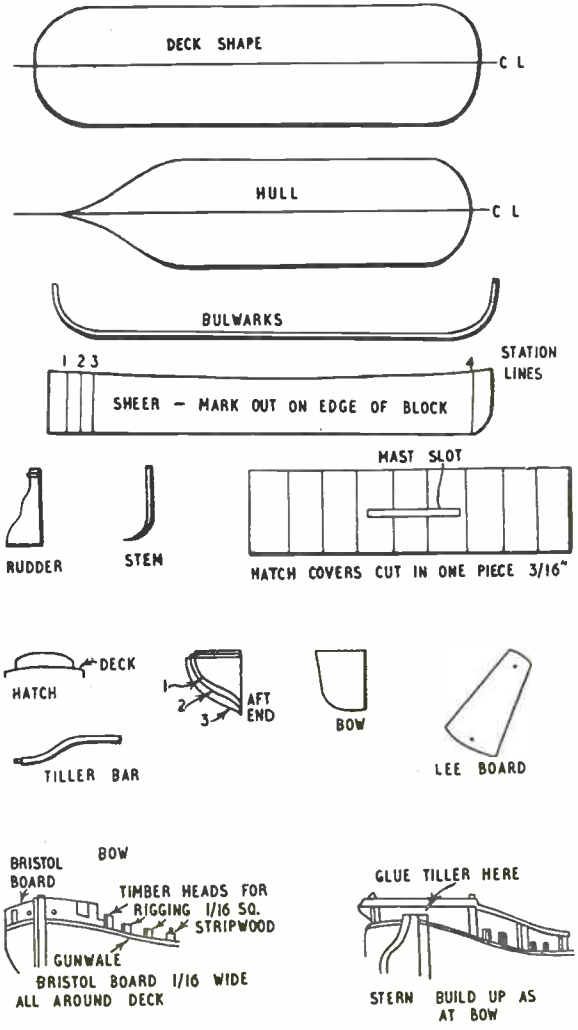
THIS type of coastal craft can be traced back as far as the fifteenth century, the better-known types being the Humber keels and Tyne keels, each designed for its own particular purpose.

At first these vessels were entirely without decks, later becoming decked at both the forward end and the stern, the main part between forming a large open hatchway. They were strongly built, of oak frames only a few inches apart and planked with oak. Sometimes the under-water portion of the hull was planked with elm.

The rig at first consisted of only one square sail. Later a staysail was added. About the middle of the nineteenth century the square sail was discarded in favour of a spritsail and staysail.

The steering was by means of a larger-than-usual oar controlled by three men, later replaced by a rudder.

The Humber keels, the subject of our first model in the present series, were of large cargo capacity, being built extremely bluff bowed with straight vertical sides. Although only approximately 60 ft. long, 15 ft. beam and 8 ft. in depth, they were capable of carrying a load of about 90 tons.



SMALL CRAFT—1
THE KEELS
By 'Whipstaff'

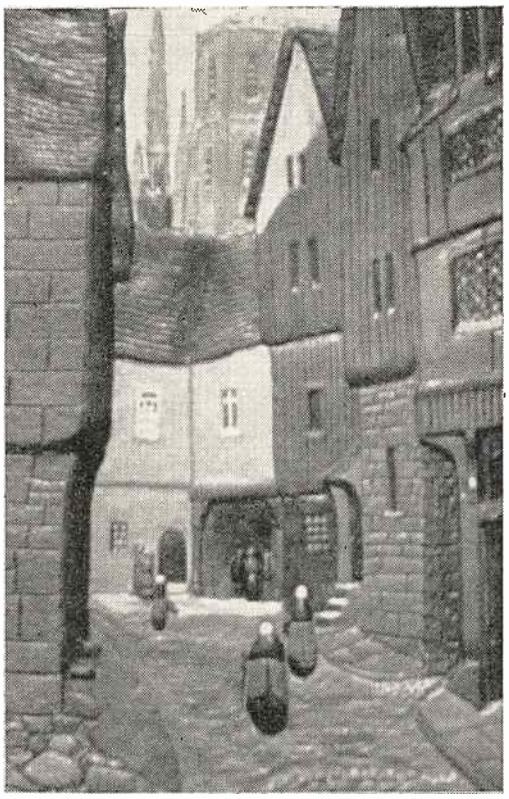
The short decks at bow and stern were connected by gangways running along the inside of the bulwarks, and the large hatchway opening was closed by cambered covers, over which were protecting tarpaulins.

The Yorkshire keel, which our model represents, had its single mast slightly forward of the amidships section and set in a tabernacle. This allowed it to be lowered to enable the keel to pass under low bridges. At this period the sails consisted of a square sail, with a square topsail. The rigging was a forestay, topmast stay, one pair of lower shrouds and one topmast shroud on each side. There was one shifting backstay and one topmast backstay that could be set up to either quarter of the vessel as required. The dead-eyes were pear-shaped, similar to those of the Elizabethan period.

For those making a large scale model, the following details are of interest. Apart from the old-fashioned windlass, there are sets of rollers. Those for raising and lowering the mast, mainsail and topsail halyard rollers at the aft or rear end of the hatchway, the tack rollers at the fore end of the hatchway, under the mast rollers and at right angles to them, the sheet rollers on both sides of the aft

● Continued on page 389

PLASTER COPY OF A PICTURE



OUR photograph is of a plaster wall plaque which has been made by Mr F. C. Robinson of 52 Benomley Crescent, Huddersfield, who has kindly forwarded details of how it was executed.

It was copied from a coloured picture and tried first of all in marquetry, but as it didn't work out successfully and the subject fascinated Mr Robinson, he decided to try in another medium — that of plaster modelling.

Using a piece of glass for the base, as this neither twists, warps, nor bends, he copied the whole picture piece by piece in Plasticine. Starting with the sky, he next did the church, then the house on the left, the houses in the centre, and finally those on the right. He continued with the paths, then the road and last of all the figures. He finished each section in perspective and detail before moving on to another. His tools were a piece of pointed wood, used particularly for the markings on the bricks, roofs, etc, a craft knife, and a photographic rubber roller for rolling out the pieces of Plasticine, which were then shaped with the fingers.

The whole completed, he then made a plaster mould. When this was dry, he rubbed in a mixture of white oil and paraffin wax to prevent the cast from sticking. From this mould he was able to take his final cast of the completed picture, which was then worked on with a craft knife to shape the figures and cut behind the edges. Other sections of the picture also had to be trimmed.

After drying out, the cast was painted with matt varnish to seal the plaster. The picture was finished in oil paints, using the original for colouring, with a final coat of varnish. It is set in a light oak frame.

For getting some of the shapes in Plasticine, Mr Robinson traced through the picture with a pencil, and for the more intricate lines, the shapes were pricked through with a pin.

● Continued from page 388

MAINLY FOR MODELLERS

end of the hatchway and one small roller set vertically under the stern rail.

Halyards for the yard consist of a single rope with a purchase and kept into the mast with a parrel as in the ships of the early days, the parrel having two rows of trucks. Sheets and tacks are single ropes and lead through sheaves on the rails and from there to winches. Braces are a single rope, one end of which is fixed to the yard-arm and led aft to near the helmsman. Bowlines are fitted to the leaches of the mainsail; also a buntline.

The topsail is fitted with sheets passing through sheave holes in the main yard-arm, through cheek blocks aft side of the yard and down to belay on the deck.

Deck fittings, that can be included on larger models than our present miniature, are two long boat-hooks, line stowed, chain cables and water cask on chocks.

The usual colour scheme was tarred below the water-line, the gunwales and topsides varnished natural wood, rails and timber heads brightly painted.

To make a miniature model, take a block of wood 4¾ in. by 1¼ in. by 1/16 in. On the four sides mark a centre line as in the sketch. Follow this by marking the deck shape on the upper surface (1 in. wide) and the sheer shape on the 1/16 in. edge, and hull shape on the bottom surface.

The block can now be carved to shape, the three drawings giving a guide to a rather full flat-sided hull.

Next cut out the bulwarks from thin veneer or Bristol board, slightly over size to allow trimming to fit your hull.

After carving the hull, cut out the rudder piece and stem from thin wood and glue in place.

The hatchway is next cut, including the slot for the mast, the top being cambered as in the sketch. This can be marked over to represent the hatchway covers or painted to represent the tarpaulin cover.

Add a small winch and hatchway and, if good at miniature modelling, add the rollers at each end of the hatchway, making these of tiny bamboo dowels. The masts in small models of this size can also be made from bamboo, to give a stronger assembly.

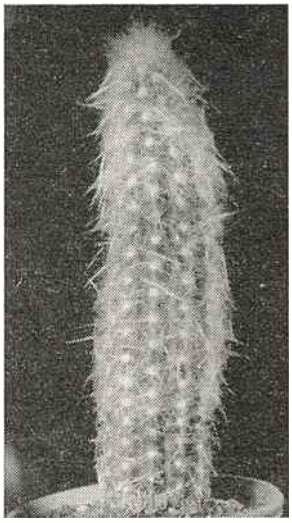
Lee boards, one either side, are cut from thin wood and pinned and glued in place. The mast is 4¾ in. high. The sails are of cream laid writing paper. The rigging cords are of black cotton for standing rigging, and fine nylon thread for running rigging. Tone sails by painting with shellac.

Enough rigging is shown on the drawing for a model of this size.

As this is not a water-line model, but full hull, mounting should be by gluing on to a nicely polished wood stand.

2—SOME CHOICE SPECIMENS

IN my first article I dealt with starting a collection. Now, assuming that the initial plants are thriving, it is time to think about adding to their number. The cacti I am going to describe are ones that will make good 'specimen' plants. These are plants which in nature reach a great size and are cultivated for their beautiful spines and impressive form rather than for flowers. These make ideal pot plants for use indoors and are good background subjects in a



OREOCEREUS RITTERII

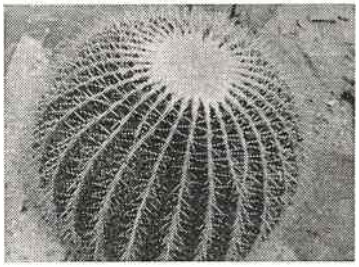
greenhouse. Some of these, like the Opuntia (Prickly Pear) will make a large plant in a couple of years and you will have to re-start your plant from cuttings every three years or so. Others are slow growing and rarely out-grow their accommodation.

The Opuntia tribe contains a vast number of plants, many of which have huge, coarse pads and will reach the dimensions of a small tree in their natural state. These are the plants to be avoided at all costs, as they look equally uninteresting when grown in pots.

Amongst the beautifully spined Opuntia is *O. phaeacantha*. This is a small padded variety with long whitish spines and well fits in with the popular opinion of a 'cactus'. Another good variety is *O. leucotricha* which is covered in long white hair-like spines.

O. microdasys is a representative of the spineless Opuntia, and exists in several varieties. The most attractive is probably *O. microdasys v. albispina*. This plant has small green pads dotted with white areoles. These latter are little raised tufts found on all cacti in varying degrees; in fact they are characteristic of the whole cactus family. *O. microdasys* itself has yellow areoles and the variety *rufida* reddish ones.

These Opuntia are natives of Mexico and are less hardy than the other plants I have mentioned. They are some of the few cacti that would probably do better in a heated livingroom than a cool greenhouse. For, although the plants will survive a minimum temperature of 40°F, under these conditions, the pads may become disfigured with brown



A large 'barrel cactus', ECHINOCACTUS GRUSONII photographed at Kew

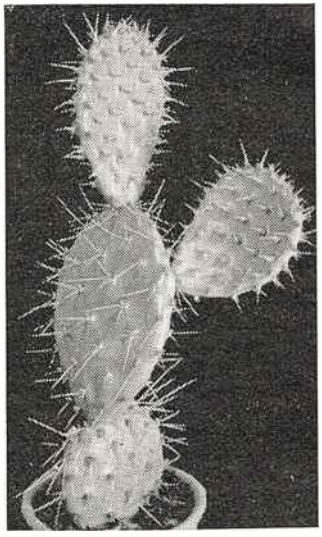
spots. Although these plants are spineless, the areoles contain minute barbs called 'glochids' which can be painful if the plants are not carefully handled. Incidentally, the pads of Opuntia are really stems and not leaves as some people may think. You may sometimes see tiny leaves on the tips of new pads; these soon fall off.

There are many beautifully spined globular cacti. Undoubtedly the best known is *Echinocactus grusonii*, the 'Golden Barrel' cactus. In its native state it may reach a diameter of two feet, but these large plants may be a hundred years old. This plant is very slow growing but with patience a beautifully spined golden ball of at least six inches in diameter will be obtained.

If something faster growing is required, the Ferocactus should be tried. These are bluish plants with most impressive spines. Good species are *F. horridus* and *F. latispinus*.

To conclude this list of specimen plants, there are the columnar Cerei. Amongst the most beautiful are the Oreocereus. These form stout columns, covered in long white wool. To get the full beauty from these plants they need the maximum sun and should be grown in a greenhouse. Good species are *O. trollii* and *O. ritterii*. Another interesting column is *Cephalocereus palmeri*. This is a tropical Cereus and needs a little extra warmth, but it is an attractive plant with its woolly head.

Of course there are always the Cerei themselves. *Cereus peruvianus* has been mentioned earlier, and there are many more of these easily grown plants.



OPUNTIA PHAEACANTHA

C. jamacaru and *C. alacriportanus* are stout columns, while *C. dayamii* has a dark bluish stem, but being of a more slender habit, eventually needs staking.

None of the plants mentioned is difficult to cultivate. The soil and conditions mentioned in the first article will suit all of them, except where a slightly higher temperature has been indicated.

(P.R.C.)

Next: Flowering cacti.

PLASTER WALL ORNAMENTS

By L. J. Hubbard

WALL ornaments are always attractive, and always in fashion, but few people realize how simply and cheaply they can be reproduced from the original. The handyman who combines artistic sense with creative ability may prefer to begin at the beginning and make his own original. The materials necessary for starting 'from the bottom up' are as follows: a rough modelling board; small mixing bowl; a cup, or measure, for water; short lengths of stiff wire; modelling clay (obtainable from an artists' supplier, or the nearest field); plaster of Paris, or Italian white, etc; a little boiled oil, a 1-in. soft brush, and some shellac.

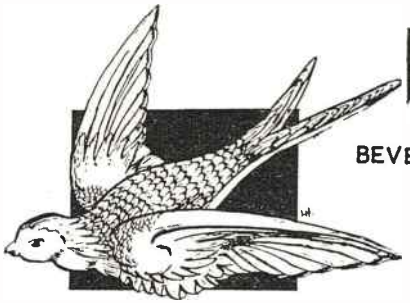


Fig. 1

Now let's assume you wish to make the bird ornament shown in Fig. 1. These can be made in pairs the same size to balance each other, or in sets of three different sizes.

Lay out a fair outline of the subject in clay on your board. Then fill in, building up in the middle to give a rounded body. Lay on the clay in small lumps, working each piece into the mass with the thumb. When you are satisfied, the whole surface can be smoothed off with wetted fingers.

Now attend to details such as the beak, feather effects and the eye, working them into the model with the help of a smooth tapered stick. Be careful not to 'undercut'. The reproduction is to be made from a plaster pull-mould, and you want your cast to come away easily. Any undercutting will key the plaster into the mould and you won't get it out except by damaging either the mould or the cast. The slight bevelling of the edges should also be noted.

Once your model is satisfactory in this respect, as well as artistically, you can prepare it for the mould. For this, build a wall of clay all round it, made up of 'bricks' laid end to end and stuck firmly together. The clay has to be well wetted to do this. It should be at least 1 in. from the model all round (Fig. 2). The height of the wall should be slightly above the highest part of the model.

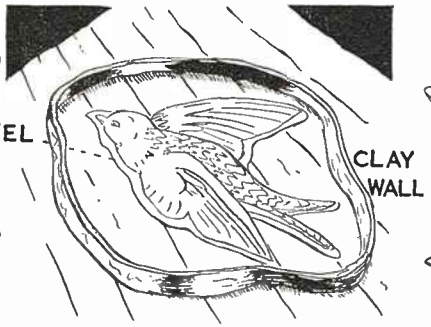


Fig. 2

To make your mould, measure some water into the mixing bowl, dry the cup, and add the plaster at the ratio of about 3 to 1 of water. Mix through the fingers to a smooth creamy consistency. While it is standing, dry your hands; then with the soft brush oil your model well, the clay wall, and the board inside it.

Take the bowl of plaster and pour out steadily, over and all round the model within the wall. It is essential that the model itself be covered while your mixture is still fluid. After that it will be best to allow it to congeal a little, to enable you to build up with the remainder. Flatten off the top so that it will stand when turned over. You can now clean the bowl out and tidy up while you wait for the plaster to harden.

Between five and ten minutes should suffice if the consistency is correct. The plaster will become quite warm, owing to chemical processes, and some of the water will come off in steam. Once it has become cold it is safe to handle, and you can turn the board over and work the new mould off the model (which should stick on to the board).

If you oiled the clay all over, and if you avoided deep undercuts, the plaster mould can be coaxed off easily. Having got it off, look inside to see if any clay is stuck into odd corners. Find out whether it is keyed in. If so, you should dig it out and afterwards pare away carefully any overhanging plaster. It is one thing to dig out bits of clay, but your plaster cast might become hopelessly keyed in if you leave the mould as it is.

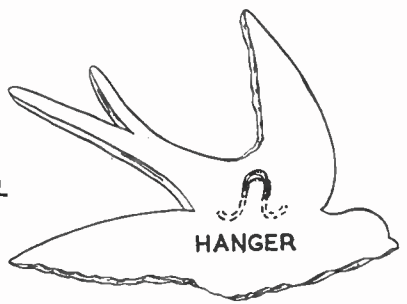


Fig. 3

Your clay model has now served its purpose. The next thing is to reproduce it, as many times as you like, from your mould.

If you require only one or two ornaments, you can use the mould right away. But you might like to go on making them, to build up a store either as replacements, as presents to your friends, or with a view to selling them. In this case, it is better to dry the mould thoroughly, either in the sun, or in a low oven. When dry, it will be quite hard and brittle. It can be tested with your thumbnail or by rapping it with the knuckles. Paint the inside with one or two coats of shellac, and you have a mould that will last for years.

Casting is the simplest process of all. Stand the mould on its back and paint the inside with oil, making sure you cover all surfaces and avoid bubbles. Mix up your plaster as before and pour it straight into the mould. Level it off with a straight-edge. While it is setting, prepare a short length of wire to stick

● **Continued on page 394**

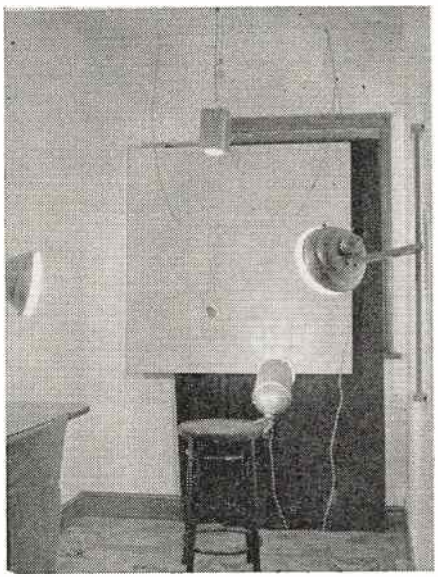
Portraiture (1)

Fitting Out Your Own Studio

DOES the approach of winter mean an end to your photographic activities for several months? With a little preparation this season can give you long hours of enjoyment and provide you with the best collection of pictures you have ever taken.

Try your hand at portraiture and open the door to a new, exciting world. Your camera need not be an expensive one, but it must have a scale down to *f*/4·5. The remainder of the equipment required is mainly for lighting. Most of this can be made in a matter of hours and at a cost of not more than a few shillings.

By K. Baxter



General view showing all equipment required—two sidelights, backlight and toplight; screen and alternative black background.

The first essential, however, is a suitable room to be used as a studio. If there is a small, spare room in your house, this will be ideal as the equipment can then be left permanently in position. Alternatively, your own bedroom can readily be converted into a temporary studio. A small room is preferable to a large one as it concentrates all available lighting and increases overall light reflection.

Correct lighting is the principal secret of taking good indoor photographs. White walls will provide maximum light reflection. Paper them with white lining-paper. This can be bought at any decorator's shop. It costs about two shillings a roll. For a room measuring 12 ft. by 6 ft. you will need four rolls. If circumstances prevent the use of lining-paper, then choose something with a white background and a minimum of pattern.

All natural light must be excluded from the room. The best way of doing this is to hang a curtain of dark material over the window. This curtain will also provide a useful background to your portraits. Patterned material will emphasize this background; plain material will create a dramatic effect.

To obtain something in between, and this will be the general requirement, a suitably prepared rigid screen is necessary. A satisfactory one can be made from a piece of hardboard measuring approximately three feet square. Paint the smooth side of it with a light grey emulsion paint. Do not use a gloss paint as a matt finish is essential if a wide range of light variation is to be achieved.

The height of the screen should be slightly adjustable to suit that of the sitter. From a coil of strong, thin wire cut off two pieces each measuring 3 ft., and two of 4 ft. 6 in. Twist the end of each length of wire into a firm loop. Screw a small hook into each top corner of the screen and two more, similarly spaced, into the ceiling. Slip the looped wires over the hooks and the screen can then be suspended at the height required from either of the two pairs of wires.

The person whose portrait is to be taken should sit in a central position about 2 ft. in front of the screen. For this you will find a stool is much better than a chair. However hard or straight-backed the chair may be, the sitter has the natural inclination to lower his shoulders. This posture on film will please neither you nor your sitter.

A good firm stool has all the advantages. There is nothing on which to lean back so the sitter will tend to assume a comfortable position by placing both feet squarely on the floor and sitting upright. He will also be less inclined to move.

If your intention is to specialize in child portraits, a stool is an indispensable item of equipment. Make sure it has a suitably positioned stave or ledge on which small children can, if necessary, rest their feet.

The next requirement is an adjustable ceiling light. This should be located in a line directly above the stool. An ordinary 100 or 150 watt bulb will give all the light needed, providing it is correctly shaded to avoid lightspill. A tall sweet tin makes an ideal shade and, if treated with aluminium paint, is a considerable aid to light reflection.

Three more lights complete the list of essential equipment. Two of these, fitted with diffusers, are sited between the camera and the sitter; the third one, used with effects discs, provides the background light. Then, with these items in position, you are all set to take your first portrait.

How to make and assemble the lighting equipment will be described in detail in another article.

● **Continued from page 392**

PLASTER WALL ORNAMENTS

into the back as a hanger, shaped as in Fig. 3. When the plaster shows signs of 'going off', push the ends of the wire into the back top-centre, leaving the middle to protrude slightly. You can cut away some plaster underneath with a knife, tunnelling upwards, to take the nail for hanging.

If you are casting small, light ornaments, you won't need wire. It will be enough just to cut out the depression in the back of each.

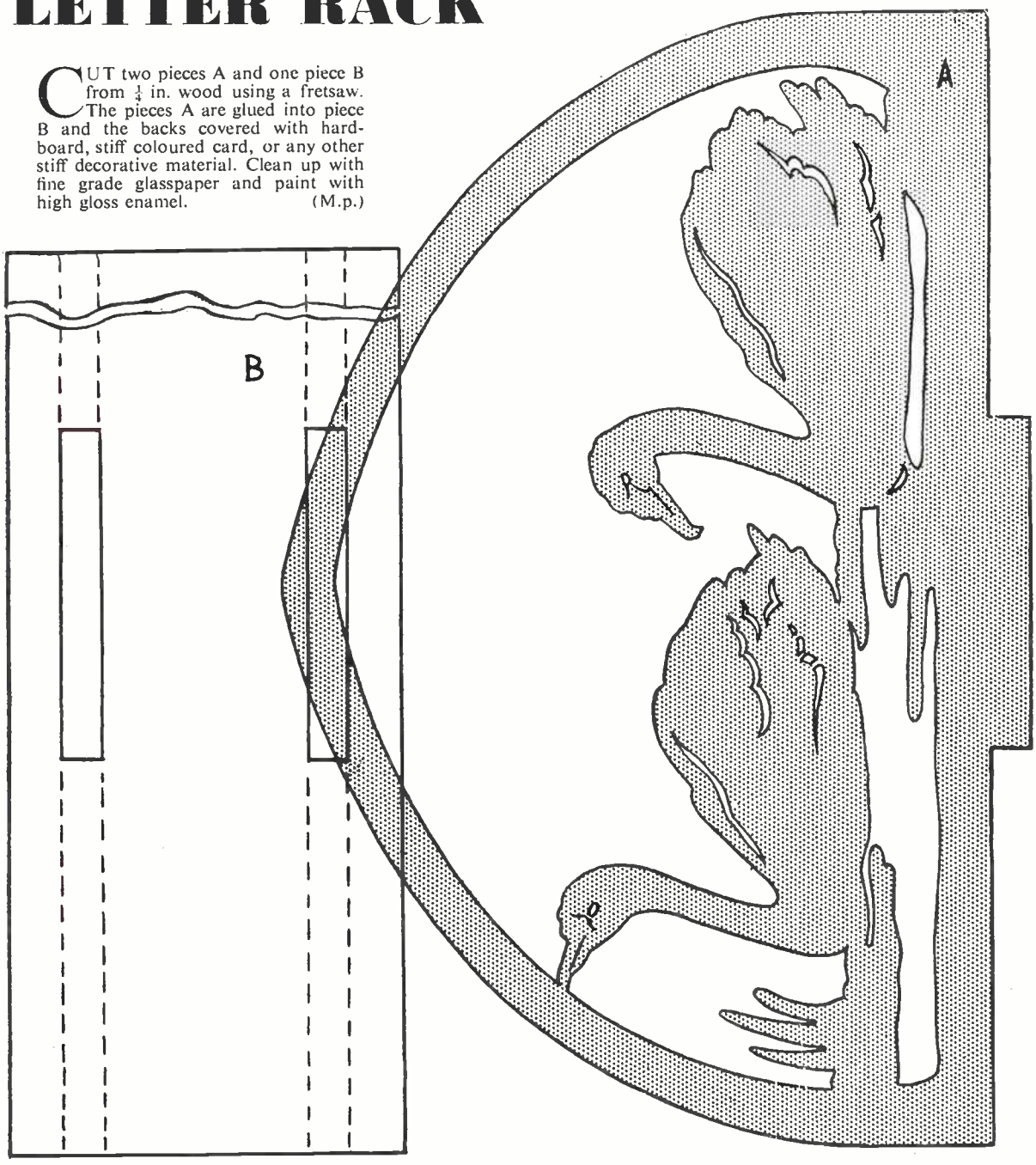
To extract the cast when fully set, turn the mould over and shake it out on to a folded cloth. Remove the bevel and dry out for painting.

Cellulose can be used at once, but water-colour needs to be sized or cellulosed. Stippling can be done with a mop brush and distemper mixed with sand, covering with a coat of gloss.

Although it is not flexible like gelatine or rubber moulds, the pull-mould can be used for many types of cast, some of which are suggested in the main illustration.

LETTER RACK

CUT two pieces A and one piece B from ¼ in. wood using a fretsaw. The pieces A are glued into piece B and the backs covered with hardboard, stiff coloured card, or any other stiff decorative material. Clean up with fine grade glasspaper and paint with high gloss enamel. (M.p.)



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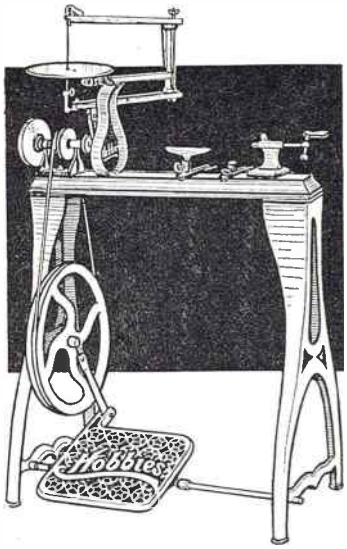
WOODWORKING LATHES FOR THE KEEN AMATEUR

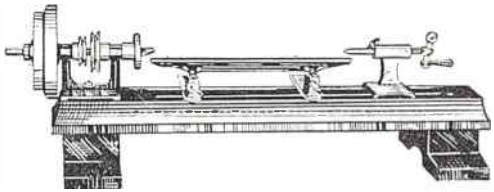


The 'Companion'

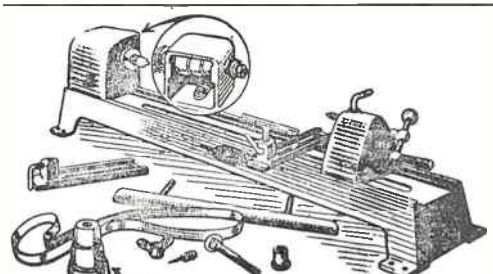
The 'Companion' Treadle Lathe. A marvellous combination for the amateur. Obtainable with or without fretsaw attachment shown. The larger driving wheel has two grooves of varying depths to give a change of speed. The headstock is provided with a 2 in. faceplate, a spur centre, and a screw centre for turning cups. It has also a solid emery wheel. The tailstock has a screw feed centre. The lathe is 14in. between centres and is provided with two rests, designs, saws, etc. The fretsawing attachment is secured to the lathe bed by one bolt, and can be put on or taken off as desired. It is fitted with 19 in. arms and an 8 in. diameter tilting table. A well illustrated book on Wood Turning is included with each lathe.
Cash Price: £13 10s. 0d. (as illustrated) or without fretsaw £10 0s. 0d.
Easy Payments: £2 15s. 0d. down, and ten monthly payments of £1 4s. 11d.
Without fretsaw, £2 down and 8 monthly payments of £1 2s. 6d.

The 'Hobbies' Lathe. This lathe has similar features to the 'Companion' but is built for larger work. It stands 6 in. higher, and the distance between centres is 20 in.
Cash Price: £15 10s. 0d. complete. Without fretsaw £12 0s. 0d.
Easy Payments: £3 5s. 0d. down and 10 monthly payments of £1 8s. 5d.
Without fretsaw £2 10s. 0d. down and 9 monthly payments of £1 4s. 1d.

Handy Bench Lathe. This machine is similar to the 'Companion' Treadle Lathe but without the legs, treadle, etc. The headstock spindle has two small 'V' groove pulleys for drive by $\frac{7}{32}$ in. diameter round leather belt. The balance wheel is similarly grooved, so that three speeds are thus provided. An emery wheel, a spur centre and a screw centre are also included. Two centres obtainable.
Cash Price: (14 in. between centres) £5 10s. 0d.
Easy Payments: £1 down and 6 monthly payments of 16s. 5d.
20 in. between centres model, Cash Price: £5 17s. 6d. Or easy payments: £1 5s. 0d. down and 6 monthly payments of 16s. 11d.



Handy Bench Lathe



Mark II Bench Lathe

On the **Mark II Bench Lathe** the keen handyman can turn his own stool legs, table lamps, wheels, and 101 things in wood. Unlike some 'cheap' lathes with bed made from steel rods or angle iron, the Mark II is built as a lathe should be built. It has a solid cast bed 32 in. long, machined its entire length. Specification: 22 in. between centres. Height of centres 2½ in. A three-step pulley in conjunction with a similar three-step motor pulley gives speeds of 1,065, 1,420, and 1,890 R.P.M. Drive from motor (*motor not included*) is by ¾ in. flat belt provided.
Cash Price: £11 11s. 0d. Easy Payments: £2 5s. 0d. down and 9 monthly payments of £1 3s. 7d.

EASY PAYMENTS. A machine can be dispatched carriage paid after the initial down payment, and subject to the completion of a simple form of agreement. It is impossible for us to allow this system to apply in any part of Ireland, or anywhere outside Great Britain. Agreement forms are obtainable at any Hobbies branch, or you can do the business through the post with Head Office at Dereham, sending your instalments there.

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