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THE ORIGINAL
'DO-IT-YOURSELF'
MAGAZINE

HOBBIES *weekly*

FOR ALL
HOME CRAFTSMEN

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COLLECTORS' CLUB

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GARDEN WEEDS

FRETWORK PLAN

ETC. ETC.

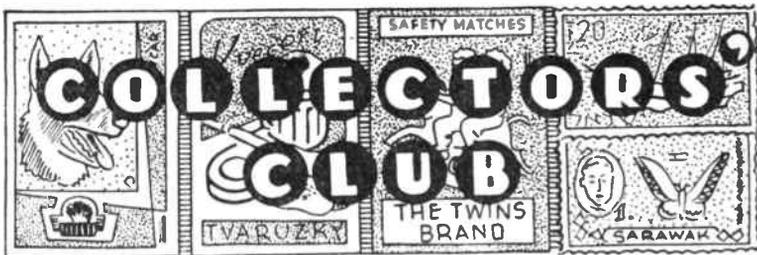


Up-to-the-minute ideas

Practical designs

Pleasing and profitable things to make

5^p



THE new definitive issue for British Honduras was issued on 2nd April. This very attractive multi-coloured set features birds.

British Honduras lies on the Caribbean coast of Central America bounded on the north and part of the west by Mexico and by Guatemala in the remainder of the west and south.

Columbus discovered the Bay of Honduras in 1502, but the first occupation of the Bay Coast was, probably, a party of shipwrecked British mariners who in 1638 settled to cutting logwood. The years that followed are part of the story of the struggle with Spain. Recent history is a record of progressive colonial development.

Recognition as a Colony under the Governor of Jamaica was given in 1862, and the Crown Colony system of Government introduced in 1871. Administrative connection with Jamaica ceased in 1884 since when a succession

of advances have been made towards representative government and the ministerial system. A new constitution was agreed in London in February 1960.

Descriptions of the individual stamps in the new set are:

1 cent

The Great Curassow (*Crax rubra*) is a denizen of tropical forest from Central America to Ecuador. These birds spend the daytime on the ground, or low

branches, feeding on small animals and fruit, but they roost in trees.

2 cents

The Red Legged Honeycreeper (*Cyanerpes cyaneus*), of Central and tropical South America, forages for food in the forest crown and along woodland edges and clearings. Fruit, nectar and insects comprise the diet. Nests are placed in

bushes or trees, and are slight, open cups.

3 cents

The American Jacana (*Jacana spinosa*) of the marshes of tropical America, has the head adorned with leaflike wattles, and the wings armed with a pair of spurs. The apple green and yellow on the wings of this species, partly concealed in the resting bird, are conspicuous in flight.

BRITISH HONDURAS ISSUE

4 cents

The Great Kiskadee (*Pitangus sulphuratus*) inhabits plantations, orchards and the more open country of Central and South America. It frequently supplements its diet of large insects with small fish from the pools and streams beside which it lives. The retort-shaped nest, hung in a tree, often reaches a length of 5 ft.

5 cents

The Scarlet-rumped Tanager (*Ramp-hocelus passerinii*) lives in loose flocks in plantations, second growth thickets and similar habitats in Central America. The male is so energetic a songster as to earn the species the name 'Song Tanager'. The open, cupshaped nests are placed in bushes or scattered trees.

10 cents

The Scarlet Macaw (*Ara macao*) which ranges through the forests of tropical America, reaches a length of 3 ft. This gaudy parrot is one of the few birds which can crack with ease the rock-hard brazil nut to extract the kernel.

15 cents

The fruit-eating Massena Trogon (*Trogon massena*) is an inhabitant of the forests of Central America. The male is green above and red below, the female plain grey save for red lower belly and under tail coverts. The egg-chamber is excavated by both sexes in a termite nest, which itself can often be some height from the ground on the trunk of a tree.

25 cents

The Red-footed Booby (*Sula sula*), which breeds throughout the year in



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'My hobbies are beer mats, stamps and pen friends,' writes ALAN J. RODEN, 27 Newman Road, The Scotlands, Wolverhampton, Staffs.

Other pen friends are:

ROBERT CHRISTIE, 14 Quarry Place, Northfield Aberdeen, Scotland. Age 11. Stamps, postcards, match labels.

SUKDAB HUKHINJER, 99/1 Karaya Road, Calcutta 19, India. Age 15. Stamps, covers, games, records.

ANIL K. CHANS, 4/A Kittle Bussel Street, Calcutta 16, India. Stamps, cards, animals, models, records.

GAURANGA GUPTA, 3 Lower Range, Calcutta 17, India. Stamps, covers, records.

KARUNAKAR RELE, 32B Khotachi Wadi, Girgalim, Bombay 4, India. Age 33. Stamps, covers, travel.

B. A. FAKOREAE, Commerce and Industry, Boat Yard, Apobo, Nigeria. All hobbies.

L. BUCK SENG, c/o Chong Hua School, Simanggang, Sarawak. Age 16. Stamps, records.

D. CROPPER, 62 Finsbury Street, York. Stamps, postcards.

BULGARIA
This beautiful set of stamps depicting 'Decorative Roses' was issued by Bulgaria on 28th March.



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RUSSIA'S NEW MATCH LABELS



Architecture is the theme of this new set of match labels from Russia.

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● Continued from page 194

BRITISH HONDURAS ISSUE

tropical seas, can be distinguished by its pied plumage and red feet. Species commonly occur where the bird is brown or grey with a white tail. Unlike all other boobies or gannets, this species nests in trees and shrubs, often at considerable heights.

50 cents

The Keel-billed Toucan (*Ramphastos sulfuratus*) of Central American forests includes fruit, berries, young birds and small reptiles in its diet. The nest, in a hole in a tree, contains one to four white eggs.

\$1

The Magnificent Frigate Bird (*Fregata magnificens*) is a large seabird of the tropical Atlantic Ocean. The male is glossy black, and has a bright red throat pouch which can be enormously

inflated during the breeding season. Frigate birds breed in colonies: the nest is a large stick structure, usually in a tree or bush.

\$2

The Rufous-tailed Jacamar (*Galbula ruficauda*) a bird of forest edges, occurs in Central and northern South America. The birds dart out from their perches and capture flying insects in mid-air. The nest-chamber, a hole in a bank, is drilled by both sexes.

\$5

The Montezuma Oropendola (*Gymnops montezuma*) which occur throughout Central America, is a large dagger-billed icterid. A colonial nester, it inhabits mainly semi-open forest, travelling in groups or flocks, and has a slow, laboured flight.

FRANCE'S 'RESISTANCE' STAMP

One of a set of three stamps issued from France during April commemorating the Resistance Movement during the years 1940-44. The other denominations with different designs are of 30 and 50 centimes value.



* * *

125 DIFFERENT STAMPS catalogued over £1 free. Request bargain approvals — Walker(A), 11 Camphill Avenue, Glasgow (Advt.)

MAKING ACCESSORY CASES

CASES for photographic accessories are expensive. If you do not wish to carry a bulky gadget bag, but merely wish to carry your camera, the cost of providing cases for your various accessories — lens hood, exposure meter, rangefinder, etc — can be considerable.

With no previous experience of leatherwork, I surveyed my collection of accessories, all in cardboard boxes and paper bags, and decided to have a go at making my own cases. The result was that I can now turn out a case for a large lens hood for 1s. 6d. Perhaps it is not quite as professional-looking as the commercial product, but, as the illustration will show, a perfectly satisfactory case can be made.



A rangefinder case, a lens hood case, and some of the tools used to make them

By N. E. Jenkinson

The tools required are few. Needle and thread, an awl for making the needle holes, a hammer, and the two punches for inserting the press studs. This latter item, consisting of two special punches and a little metal cup, costs 3s. 9d., and will last a lifetime.

The materials are inexpensive. A leather shop will sell you a suitable piece of leather quite cheaply, and also the press studs and the rivets. Cardboard from a box used for packing photographic paper or plates will be suitable for the stiffener.

Fig. 1 shows the parts required to make a LENS HOOD CASE. Piece A is the outer cover of the case. It should be

3 in. longer than the circumference of your lens hood, and $\frac{3}{4}$ in. wider than the width of the hood. The sides consist of two layers of leather and a layer of cardboard between them to act as a stiffener. Pieces B, C, and D, are all the same size and should be $\frac{1}{4}$ in. greater in diameter than the diameter of the lens hood. Piece E is for extracting the lens hood from the case. It should be 5 in. in length. Piece F is riveted to the side of the lens hood case and the camera strap then passes under it. It should be $\frac{3}{4}$ in. wider than the camera strap.

Having cut out all the pieces with either scissors, a sharp knife or a razor blade, assemble the sides. Piece B is glued to the circle of cardboard with the shiny side of the leather outwards. Piece D is glued to the cardboard with

the rough side of the leather outwards. Allow to dry under pressure so that the leather is secured to the cardboard at all points.

It is almost impossible to stitch leather unless needle holes have been made in advance. In Fig. 1 it will be seen that a needle line and holes have been marked on Piece A. Measure the distance round half the circumference of one of the sides and then, using the blunt side of a knife blade, score a line along piece A equal to this distance. At $\frac{1}{4}$ in. intervals along this line make holes with the awl. Mark a similar line round the edge

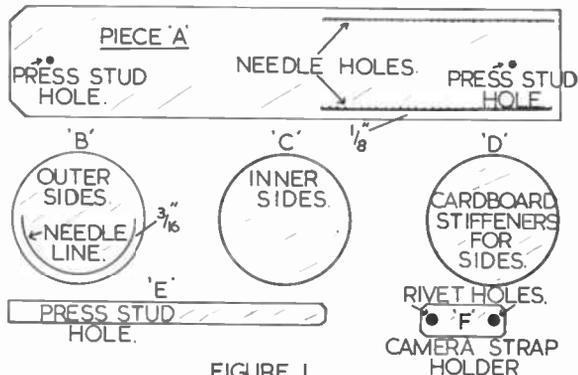


FIGURE 1.

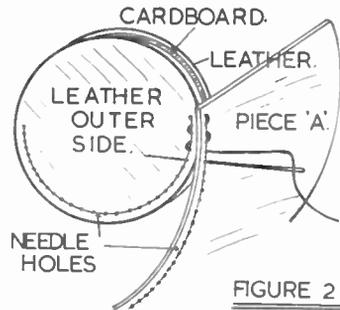


FIGURE 2.

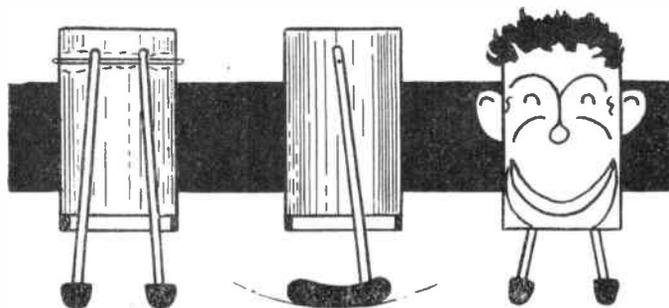
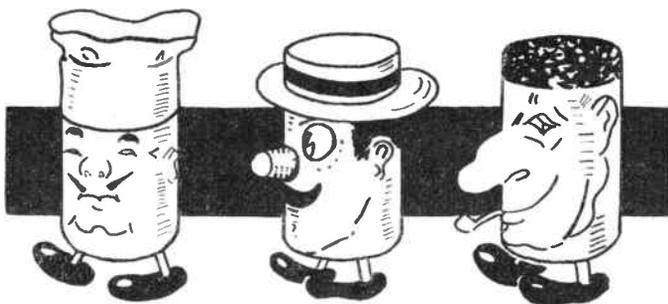
of the outer side of the two sides, as shown. Count up the number of needle holes in piece A and make an equal number of holes in the side pieces. A glance at Fig. 2 will show that the stitching goes through the sides at an

● Continued on page 197

WADDLING WHIMWHAMS

MANY readers must have seen quaint figures such as illustrated here, which, when placed on a slope, waddle down in a most amusing fashion. It is not at all difficult to make these models if trouble is taken to understand the principle on which they work. Any odd scraps of material may be used, and on availability of these will depend the dimensions of your model.

The main bodies in every case are most conveniently made from cardboard tube (postal tube). This can be cut in lengths with a fret or tenon saw. Tube of about 1½ in. to 2 in. will do nicely, though the model can be made practically any size.



The legs are made of thin dowel — say ¼ in. diam. or not much more in the case of the smaller models. The feet are made of soft wood carved with a penknife to the shape and proportion shown. Note the angle at which the legs enter the feet.

Wire axle

The axle at the top is merely a stiff piece of wire. The holes in the tops of the legs are drilled at a slight slant so that when assembled, the legs are splayed out a little so that they do not knock against each other. The legs are kept spaced out nicely by means of beads.

It is of the utmost importance to bear in mind that the centre of gravity of the tube must be well below the axle. For this reason it may be necessary to fit a strip of lead all round the bottom. This is especially important when subsequent decorations (big noses, etc.) alter the balance.

When placed on a slope, the cylinder of the model naturally swings like a plumb bob, so as to right itself, and as it does so, it knocks against one of the legs. Owing to the curvature at the foot, one leg is pushed forward. This again alters the balance. The cylinder swings again to right itself, and in doing so knocks the other leg. So the process goes on. Remember, then, that if the bottom

is not heavier than the top, the toy cannot possibly work, and if your model refuses to act properly check up this vital point.

Having got the basic model to work, the interesting job of decorating can be done. The top of course is covered in. Were it not for the difficulty of inserting the axle in such a case, a canister with a closed top (or bottom) could be used from the start.

Hats and features

The top of the cylinder forms the top of the hat. The rim of the 'straw' hat illustrated is just a ring of cardboard fitted on tightly. The chef's hat can be of paper or cloth. The Dutchman's fur hat can be a scrap of actual fur if available, and the same applies to the monkey's hair.

Ears are usually painted on, though in the case of the monkey these can be made separately of thin card or leather and stuck on. Noses can sometimes be painted on, and at other times, modelled. A cork makes a good basis. This can be used without alteration. The Dutchman's prominent nose can be basically a cork plus plastic wood, or carved from a piece of balsa wood.

In decorating, one can start off by pasting plain paper round the cylinders

and then using poster paints, with, perhaps, a final coat of varnish to stop them getting soiled too easily. Or they can be given a coat of size (thin glue) and when quite dry, painted with enamels.

The smoothness and the slant of the slope down which the figures waddle, is best found by experience. It looks very amusing to have several of these figures waddling down a slope. They look very much like those giant figures used particularly on the Continent in carnival processions. (E)

● **Continued from page 196**

ACCESSORY CASES

angle and theawl should therefore make holes at that angle.

Make a hole in piece E for a press stud. Make a similar hole in the piece A at the same end as the stitching, and then secure piece E to the inner side of piece A. Rivet piece F to one of the sides and you are ready to stitch the pieces together.

Fig. 2 shows the method of stitching. The thread should be waxed with furniture wax. One of the most difficult tasks is to secure and conceal the end of the thread. I found it best to knot it, pass it through the leather and then glue the tail-end of the thread under the edge of the leather. Stitch as shown from one end to the other and then return, filling the alternate spaces.

When both sides have been stitched, mark the place for the outer press stud. Punch the stud into place and the case is finished.

With slight variation, most accessory cases follow this basic pattern and once you have made one case it is easy to make others.

Mainly for Modellers

WE are now going to consider the various types of material for modelling the sea in various moods, and the methods described will be of interest also to readers who make waterline models.

The most simple setting we can use is that of a calm sea, either at sea in mid-ocean or with the ship riding at anchor in the harbour. By a calm sea I do not mean an absolutely flat surface. To get the sea as smooth as glass would be a very rare occurrence; there will always be a slight ripple or undulation.

To model this type of water there are several simple methods. One favourite of my own, which I introduced to our readers some years ago, is very useful for many of Hobbies' waterline kits and for small scenic models. That is the use of cellophane.

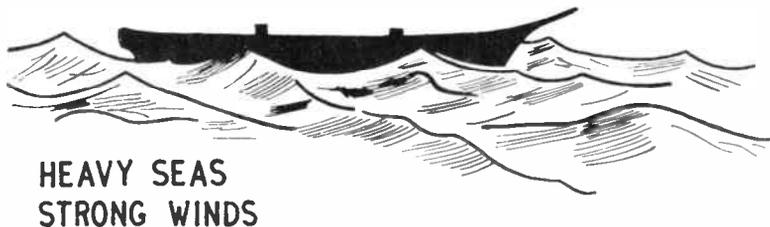
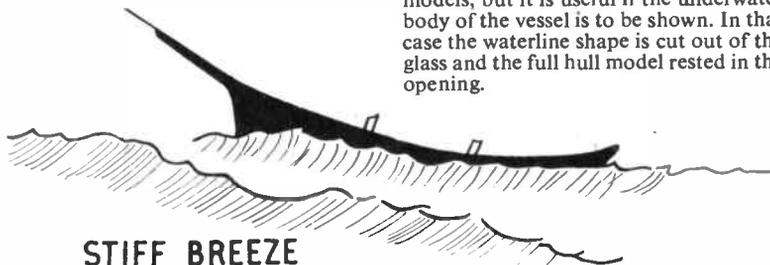
The method is simple. Paint the base-board, (for preference in artists' oil colours) to the colour you require. For local seas around our coasts choose a greyish-green; for tropical water, (say the Mediterranean or Pacific) a blue is used. When dry, the baseboard is coated

with a slow drying adhesive. The model is then placed on the base slightly aft of its final position (if it is to be shown as in motion) and then gently pushed slightly forward. This will ripple the cellophane sufficient to show the slight wave formation and wake formed by the ship's motion. If the model is to be shown at anchor, it can of course be glued in position without rippling the cellophane.

SCENIC SHIP MODEL—3

By 'Whipstaff'

For larger models, the base can be made of ripple glass; this can be obtained with a slight colour tint. The ship can be glued direct on to the glass for waterline models, but it is useful if the underwater body of the vessel is to be shown. In that case the waterline shape is cut out of the glass and the full hull model rested in the opening.



When we come to other types of sea, there are several worth while materials available for use. Putty I do not greatly favour, as it is liable to crack slightly after a time. Wood-carving, if within the modeller's capability, is one of the finest for getting a realistic effect. This is done by carving the surface of the wood base to represent the waves, rollers, etc.

The nearest to wood-carving is to model the sea in plastic wood; but in this case it is necessary with most brands to allow for a little shrinkage on drying. Other materials used are Plasticine, modelling clay, Barbola paste, papier mâché, plaster of paris, silk, etc.

A method to enable us to make a realistic sea where sizable rollers or waves are being depicted, is the use of wood or cardboard formers cut to represent the tops of the waves and glued in position on the base board. Pieces of butter muslin sufficient to cover the whole base are cut, and fine quality plaster of paris rubbed in to fill up the spaces in the weave of the muslin. This is then wrung out in warm water. The top edges of the contour pieces are wetted and the muslin spread out over the base, allowing it to sink naturally into the spaces between the contour pieces, thus giving the hollows between the wave crests. Pieces are added until a firm surface is obtained.

Having obtained a satisfactory sea, place the model in position and press down to form a flat base upon which to later glue the model. A paste is now made of plaster of paris, and the base given a fairly thick coat. Before the plaster dries, add the final modelling of the waves; for this a piece of flat wood with the end rounded off such as a garden label is very useful.

The accompanying sketches show several wave formations, and could form the basis for the wood or card formers. Many ideas for seas can be obtained from good drawings, paintings, photographs or sketches, which appear from time to time in the better magazines and journals such as the 'Geographical Magazine'.

Fun with Photography

By Mae & Ira Freeman

THIS book is particularly intended for boys and girls who have just got their first camera. It tells all you want to know about what a camera is and how it works, what focus means, what the film consists of, how to load and snap the shot, and how to use the light available for a good picture. The way to take people, landscapes and buildings, action shots, animals, trick pictures and 'candid' photos are also fully explained. The 'right' and 'wrong' method for different subjects is well illustrated pictorially. Published by Edmund Ward, 200 Bishops-gate, London, E.C.2. Price 12s. 6d.

'HONEYCOMB' WALL FITTINGS

THE hexagonal fitting shown here, with its pleasing and unusual shape, offers an attractive and easy way of adding a distinctive touch to the home. By using the unit in different rooms it creates a link between them and a unity in decoration. Although the dimensions given here can be altered if necessary, to be in scale with the rest of the house the same size of unit should be used throughout.

By A. Liston

Each unit is made from six 12 in. by 6 in. pieces of $\frac{1}{2}$ in. thick wood or chipboard. The ends of the sections are angled at 30 degrees A. They are glued and screwed together, and can be strengthened on the inside with metal angle brackets bent to an angle of 120 degrees. The shape should be checked against a full-sized paper template to ensure that the angles are equal.

The back is made from a 2 ft. square of plywood or hardboard. This is cut to shape, using the template, then glued and screwed to the sides.

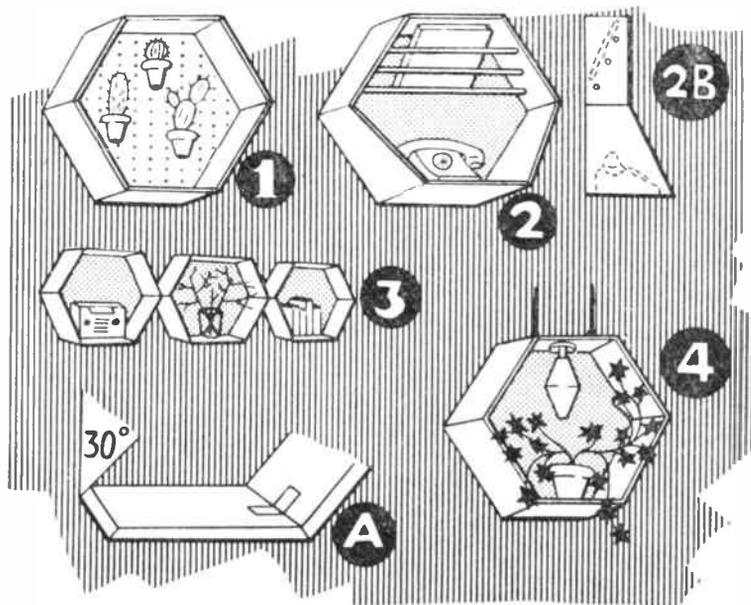
Each unit is best finished in pale grey or white, with the inside of the back painted in a clear, bright colour to blend with contemporary furnishings, or alternatively, a matt black finish may be applied.

The units can be used in many ways, either singly or in groups. A few suggested uses are:

1. A wall garden. The plant pots are wired to the back, which in this case can be made of pegboard.

2. A telephone shelf. Three dowelling spars at the top form a rack for the directory. One point to note is that the bottom section on which the telephone rests should be 8 in. deep. One of the new coloured phones, however, needs a

plain wall. The hexagonal shape lends itself to horizontal, vertical or diagonal arrangement. With gay interiors, they can give a kitchenette a modern look, and make handy racks, especially when fitted with pegboard backs and hooks.



depth of $9\frac{1}{2}$ in. The two lower side sections may be increased in depth, if desired, towards their lower ends, to the same breadth as the shelf (2B).

3. A line of display shelves. These take up no floor space, and make a feature of a

4. A hanging plant container. This repeats the hexagonal motif for use in the hall. The optional light fitting is simply a decorative bulb in a white plastic lamp-holder, which is screwed to the top of the fitting.



PAT BOONE

PAT Boone, great-great-great grandson of that famous pioneer Daniel Boone has three weekly shows on



WBAP-TV, and on Sundays he preaches at Slidell, Texas.

He began singing at the age of 10 at Belle Meade Happiness Club in Nashville, Tenn. on Saturdays, and continued gaining experience around Nashville until at the age of 17 he had his own radio show.

Pat attended David Lipscomb High School in Nashville, where he was president of the student body, was voted the most popular student for two years, and excelled at baseball, basketball, and tennis. For five years he has led singing at church. With all his activities Pat makes all A's in college, and his weekly hour TV programme for teenagers has been very successful with the Texas audiences.

A DETAILED ANALYSIS

IN the previous article on scraperboard drawings we gave a general description of the work, the tools required and some examples of textures used. We now propose to give a more detailed analysis of how to make a picture. We are assuming that you have obtained some board and made a few experiments and it is quite possible that you may have experienced a few difficulties.

self has a special surface which will become damp and soggy unless kept in a dry place. So before embarking the board should be made perfectly dry.

By S. H. Longbottom

Normal room temperature is sufficient and it is unnecessary to warm it before a fire. Moreover, the board is inclined to be brittle and the best way of working is to temporarily fix it to a drawing board. The latter should not be too large since you may have to twist in all directions to assist cutting. Fixing is done by means of a few dabs of rubber adhesive on the back of the board which will permit easy removal, or by means of pushpins.

So far as working is concerned you may find it better to raise the board to a convenient angle, especially for freehand work.

The sketch itself is rather important and before we can attempt the cutting we have to decide on a subject. In Fig. 4 you will see a preliminary attempt made entirely freehand directly on to a black board, and this is the method to adopt.

First of all plan out your sketch and then make a tracing on transparent paper. This is then transferred to the black board. I use red carbon paper

which is bought from a typewriter shop. You may use red or white crayon rubbed on to the back of the tracing but do not use ordinary chalk, which is gritty and would scratch the board. Use a medium grade pencil for retracing the outline of the subject for if you use a hard one you may make an impression which will interfere with the cutting later. If you merely trace the outline this will show up



Fig. 4



Fig. 5

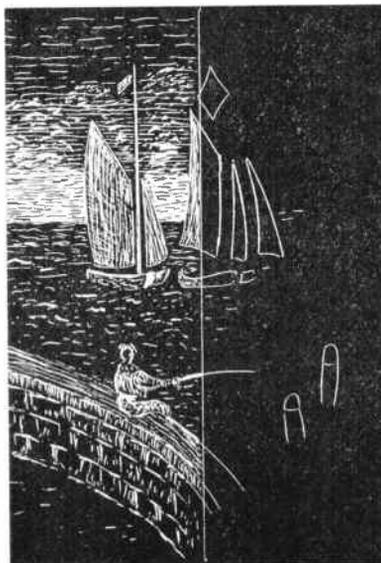


Fig. 6

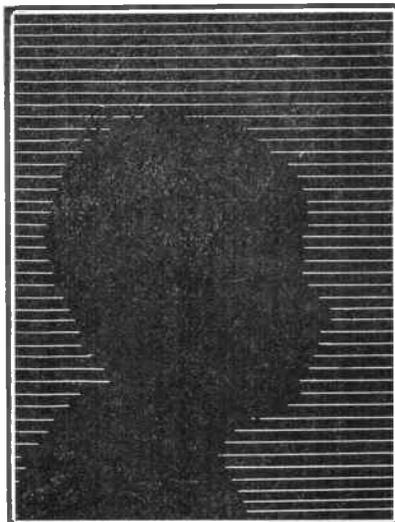


Fig. 7

reasonably well for you to proceed with the cutting.

With the tools to hand we first sketch in the outline, which may be ruled or freehand as the case may be, and we then proceed to texture, continuing as far as possible. A sketch may not be completed at one sitting, of course, but it can be laid aside without harm. In some parts it may be necessary to remove patches of the black coating and then re-texture with fine Indian ink lines, or to correct errors made while cutting. The latter should not arise if care is taken, but there is a warning to give. Do not dig into the board for you may have to make some corrections. Use sharp tools and scrape the surface so that if you do have to paint out with ink all will be well. This cannot be done if the surface has been too deeply scarred.

In Fig. 5 we show a basic stencil which has been used for the cutting shown in Fig. 6. This is quite an easy method for you to try, especially if you are not very efficient at sketching. All you have to do is to either buy or make a

stencil from a picture. Lay the stencil on to the black board and trace the outlines through the apertures with a finely pointed crayon. You will see how the outline has first been traced by a fine trimmer in the right half of Fig. 6 and how we have then proceeded with the cutting in the other half. This again is a freehand drawing. Note how the cuts have been varied by using a fine point and a scalpel.

Silhouettes are very easy to make on black scraperboard. All you have to do is to trace the outline of the shape on to a board with a light coloured crayon. Lines are then cut up to the edge of the shape, giving a result as in Fig. 7.

So far we have been dealing with the preparation of pictures on black scraperboard since these are the easiest but we also have white boards at our disposal. These can be used where there are more light areas than dark and the method is a little different. Moreover, there is no point in using a black board if we have to scrape away a large proportion.

We make a tracing of our sketch in just the same way, transferring the outline to the white board, but this time using black lead rubbed on with a pencil to the back of the tracing paper. We now fill in the shadow areas with Indian ink and allow this to dry thoroughly before proceeding to the cutting. We cannot emphasize this fact too much. The ink must be applied exactly without blobs and if there is any surplus after

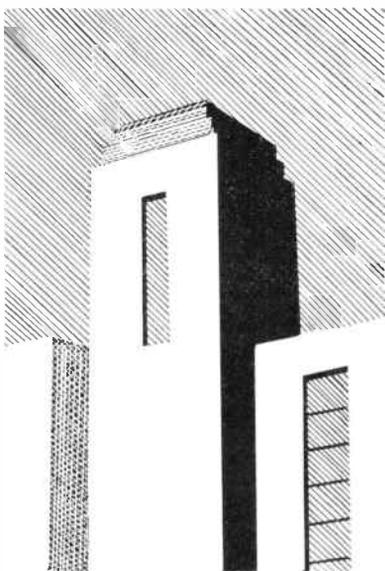


Fig. 8

applying, remove it with a dry brush, otherwise it will crack and flake off. If you do not allow adequate drying time the surface will be soggy and prevent any tool from making clean cuts.

When you are sure that the board is

dry you may proceed to cut.

A simple example of work on a white board is shown in Fig. 8 which is an impression of Leeds University. Note that some parts have been textured with ruled lines in Indian ink and however careful you may be some of these may overrun your outline. The same applies to the wash of Indian ink. This causes no concern, for all you have to do is to lay a straight edge on the board and cut away the errors with a scalpel trimmer. Note how the ruled lines in the parapet have been cut by crosshatching and also the side of one building. This particular cutting has been deliberately made to show the vivid contrasts possible in this type of work, although it is really a simple sketch.

Your early efforts in scraperboard may not be of a high standard but this is hardly to be expected and they should be regarded as experiments. Do not try to do too much in these early stages. Be patient, get accustomed to your tools and medium, trying to discover the best technique for yourself. Remember that every artist cultivates his own style and that every medium has its own limitations. These you have to learn for yourself by experiments and the observation of illustrations and advertisements using such pictures.

But you may be assured that scraperboard is a very rewarding medium once you have learned its qualities and even in the early stages it is really fascinating.

A Collapsible Sawing Stool

THIS handy sawing horse consists of three main parts — two leg assemblies, and the centre plank. These are held together by two 6 in. bolts enabling the structure to be quickly dismantled for easy storage or for transporting by car.

Pieces A and B are all of 4 in. by 2 in. material, and the dimensions should be approximately as shown in the side and end views in Fig. 1. Pieces C are 3 in. by

2 in., and are secured between the legs B by countersunk screws. The end pieces D and E are of 1 in. thick wood.

The complete assembly is shown in Fig. 2. The bolts pass right through piece A and pieces C, with the washer and nut underneath. The easiest way to tighten the nut is to use a box spanner and tommy bar. Give two coats of wood preservative to finish off. (M.h.)

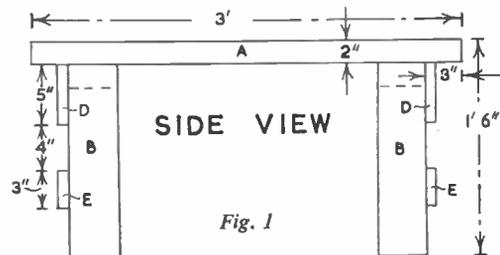


Fig. 1

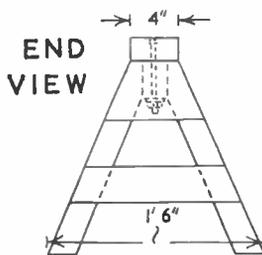


Fig. 2

CHEMISTRY AT HOME

EVERYONE knows that milk is a valuable food. In fact, it is well balanced food in that it contains fat, carbohydrate, protein and small amounts of mineral salts and vitamins. Apart from its food value, it is the source material for some plastics, textiles, paints, adhesives, and paper finishes. It may even be pressed into service as a secret ink!

In these experiments skimmed milk will be required. If this is not to hand, pour milk into a separating funnel, and let it stand overnight undisturbed (see diagram). The fat rises as cream to the surface. Run off most of the lower layer into a bottle for use.

Use a little of the skimmed milk to try out its value as an invisible ink. Write with a clean pen on white paper, and let the characters dry. The writing will be invisible. Now heat the paper over a gas or spirit lamp flame. The message appears in brown.

The main protein of milk is casein, a complex organic substance which in milk is combined with calcium, Ca, and phosphoric acid, H_3PO_4 . It may be separated from these two last by means of acetic acid, CH_3COOH .

To 200 c.c. of skimmed milk in a beaker add 4 c.c. of strong acetic acid, stirring well. The casein is precipitated as tiny white curds. When milk goes sour and curdles it is due to a similar reaction, except that the acid causing this is lactic acid, $CH_3CH(OH).COOH$, which is produced by micro-organisms.

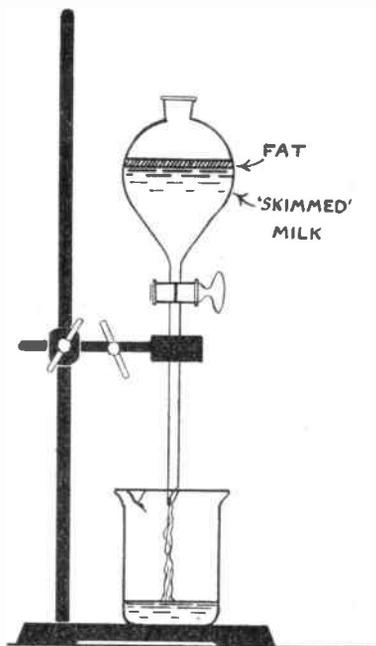
The casein has now to be filtered off and purified. Filtration by means of ordinary filter paper is, dishearteningly slow owing to blockage of the pores. Coarse cotton cloth should be used instead. When the curd ceases to drip, squeeze out well and put it into a beaker. Now add a solution of 3.3 grams of sodium carbonate (washing soda), $Na_2CO_3 \cdot 10H_2O$, in 25 c.c. of water, H_2O . Stir well. The casein dissolves. As a little fat may still be present, it is as well to let the solution stand a few hours in a separating funnel. Any fat rises to the surface, and the lower layer of casein solution may be drawn off from below.

Into the casein solution stir little by little acetic acid until a drop of the liquid turns blue litmus paper red. The casein is thrown out of solution again as a white precipitate. Filter this off by means of a cotton cloth filter, wash several times with water, and dry it in a warm place. The casein is left as brittle crumbs.

Suitably processed casein yields the plastics Galalith and Erinoid, which are used for button making, and to simulate horn. A wool-like fibre termed Lanital is also produced from it. Casein plastics have also found use as bristles and, when curled, as upholstery fillings.

EXPERIMENTS WITH MILK

The carbohydrate of milk is a sugar known as lactose, $C_{12}H_{22}O_{11} \cdot H_2O$. It might be thought that removal of casein from milk by means of acetic acid and filtration would yield a filtrate from which lactose could be obtained by evaporation, but this would leave calcium in solution. By using rennet (obtainable from grocers) instead of acetic acid the calcium is precipitated along with the casein.



Preparing defatted milk for the experiment

Warm about half a pint of skimmed milk to 36 to 41 degrees Centigrade, and add a half teaspoonful of rennet. The casein separates as a curd in a few minutes. After maintaining the temperature for 20 minutes heat up to 60 degrees, stirring well. Filter off the casein through clean cotton cloth.

Evaporate the filtrate on a water bath. Filter from any solid matter which separates and continue the evaporation until the liquid is syrupy. On cooling and standing a crystalline powder of lactose separates out. Drain off the mother liquor, and let the lactose dry. If desired it may be further purified by dissolving it in as small a quantity of hot water as possible, and allowing to crystallize again.

On tasting a little of it you will discover that it is much less sweet than ordinary sugar (sucrose), $C_{12}H_{22}O_{11}$.

It has been mentioned that lactic acid is responsible for the curdling of milk when it goes sour. This production of lactic acid suggests a means of preparing lactic acid from milk. However, when the acid concentration reaches a certain level, the micro-organisms stop lactic acid manufacture. To adapt the principle and maintain favourable conditions for the micro-organisms to continue their activity, the acid must be removed as it is formed. Calcium carbonate (precipitated chalk), $CaCO_3$, is added, which combines with the acid to form calcium lactate, $[CH_3CH(OH).COO]_2Ca \cdot 5H_2O$, water, and carbon dioxide, CO_2 :
 $2CH_3CH(OH).COOH + CaCO_3 = [CH_3CH(OH).COO]_2Ca + H_2O + CO_2$.

The acid itself is formed by breakdown of the lactose and combination with water:

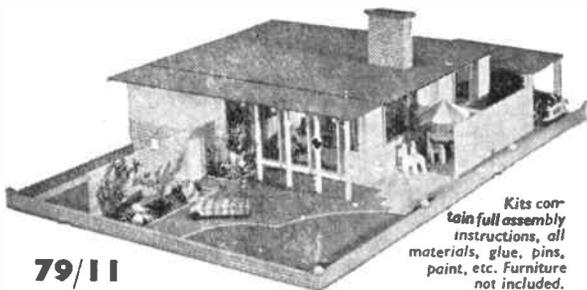


The acid yield is increased by the addition also of a little rotten cheese, and of sucrose in the form of syrup. Mix together in a jar 66 c.c. of sour skimmed milk, 215 c.c. of water, 50 grams of golden syrup, 25 grams of precipitated chalk and 2 grams of rotten cheese, cover loosely, and set the whole in a warm place, such as the oven top. Stir up daily, adding water to make up that lost by evaporation. In about a week the mixture is almost solid with calcium lactate. Transfer the whole to a square of cotton cloth and squeeze out the liquid.

Extract the calcium lactate from the solid mass by heating up several times with water until no more appears to dissolve. Evaporate the united extracts to low bulk, and allow to cool and stand. Warty crystals of calcium lactate separate. Filter them off, and dry them on a tile. Purify by recrystallizing them from the smallest possible volume of

● Continued on page 204

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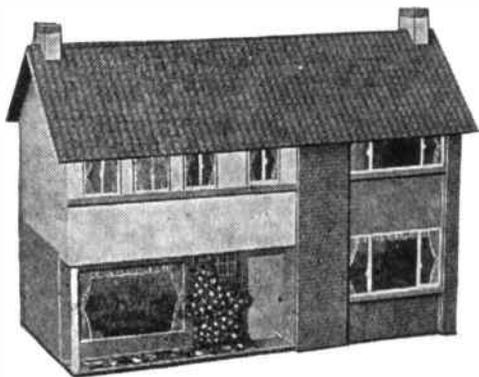
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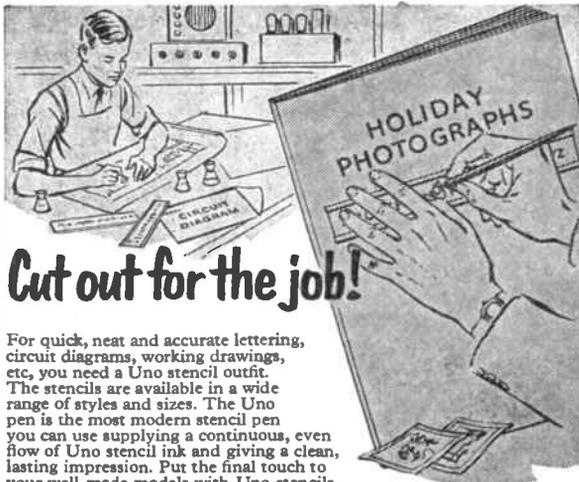
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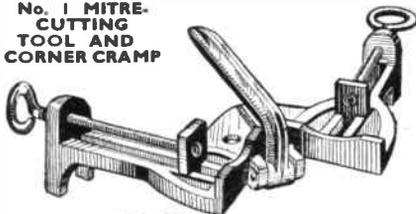
H.2

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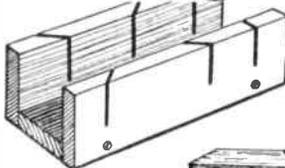
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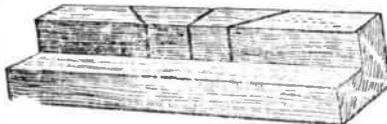


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PING-PONG FINGER PUPPETS

THE giving of puppet shows is an ideal hobby for both young and old. Whether you do it just to amuse yourself, or on a more ambitious scale to entertain friends, you will be sure to have a lot of fun.

Puppets have appeared in a variety of shapes and sizes over a long period of time, and fresh forms are constantly being devised. Here then is an idea which you can work out and invent a lot of 'little people'. The idea is making your puppets from ping-pong balls, and there is ample scope for much experimenting. A few balls, suitably dressed, will provide you with a wealth of entertainment. The adornment of your puppets need not cost much, as you can use up many odd scraps of material.

By A. F. Taylor

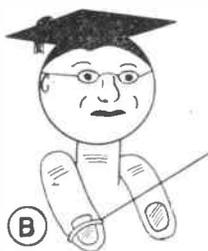
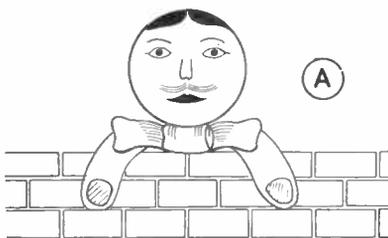
It is a good idea to remove the shiny surface of the ping-pong ball before attempting any form of decoration. It will then be possible to apply paint more easily, and materials of all kinds can be glued on to it much better. Very fine glasspaper will soon produce a matt surface if it is used carefully.

To use a ping-pong ball as a puppet, a circular hole must first be cut in it so that it can be slipped on to one of your fingers. By using a pair of small sharp scissors you should not have any difficulty in cutting a neat hole. Remove any rough sharp edges with either a file or a piece of glasspaper wrapped round a length of dowel rod.

It would be best to experiment at first with the use of paint and materials of all kinds in order to get the desired effect, but as you progress it is a good idea to make them in sets. The characters of a play or a pantomime, for instance, would give you something worth while to work out, and it gives ample scope for the resourceful designer.

Painting the features of the face on to the ball can be done with many different mediums. Water colour paints and poster colours are cheap and easy to apply. For a more professional looking and lasting job you can try artists' oil colours or cellulose enamels. When dry they will not rub off or be affected by dampness. The oil colours may be applied very thickly if you want to get a raised effect, but plenty of time must be allowed for the paint to dry thoroughly.

Pieces of wool, unravelled string and dolls hair can be stuck on the top of the ball in numerous arrangements. Mother



or sister would no doubt be glad to help in creating attractive 'hair-dos'. Moustache and beard can likewise be formed from a tuft of dolls hair or a few bristles from an old brush and glued in place. Features that project such as nose and ears can be modelled from barbola paste and glued on instead of just painting them directly on to the ball. For quick temporary work Plasticine or other modelling clay is quite useful.

Very effective eyes may be added by drilling holes and gluing in small coloured beads. Shades of blue, brown or grey will be quite life like, and the hole in the bead may be left open or a pin head glued in. Hats and other articles of clothing are easily fashioned from oddments of material.

The sketches give a varied selection of what is possible, and will help you to develop other characters. At A, we have the immaculate gent with bow tie (slipped over the finger before putting on the ping-pong ball). He could have a top hat, but with slight alteration — a pair of spectacles made of thin wire, and a mortar board hat — he is a schoolmaster B. The cane is a length of wire slipped over one of the fingers.

The use of wool for hair is portrayed at C, and this is straight lengths of fairly thick material. A 'fuzzy' hair can be produced with thin wool from an old garment which has been knitted up and then undone. Besides human heads, you can experiment with animal or weird forms as depicted at D, and E. If the show is for young children, do not make them too hideous.

When giving a show, you will need some sort of scenery to hide the hands; and this should be designed to suit the character of the act being performed. Card or thin plywood suitably decorated with paint, or a coloured scene cut out of a magazine, will solve this problem. The figure A, is shown leaning over a brick wall. Small cut-outs of trees and buildings, suitably placed in front, will help to make the scene more interesting.

To make the show more professional looking, you can build up a miniature stage complete with curtains, scenery and lighting effects. With musical selections played on a record player, you can provide really first class entertainment.

● Continued from page 202

EXPERIMENTS WITH MILK

boiling water, filtering the hot solution if it is turbid. Drain and dry the salt as before.

To prepare lactic acid from this salt, oxalic acid, $(\text{COOH})_2 \cdot 2\text{H}_2\text{O}$, may be used, for it forms a highly insoluble salt with calcium. Namely, calcium oxalate, $(\text{COO})_2\text{Ca} \cdot \text{H}_2\text{O}$. Free lactic acid is left in solution:



By filtering off the calcium oxalate we

are left with a filtrate consisting of a solution of lactic acid.

Dissolve the calcium lactate in water, and carefully add a solution of oxalic acid until it just ceases to give a white precipitate of calcium oxalate. Filter off the precipitate and bottle the lactic acid for your stock. It usually contains a small proportion of mannitol, $\text{CH}_2(\text{OH}) \cdot (\text{CH} \cdot \text{OH})_4 \cdot \text{CH}_2\text{OH}$, but this is of no consequence for ordinary laboratory use.

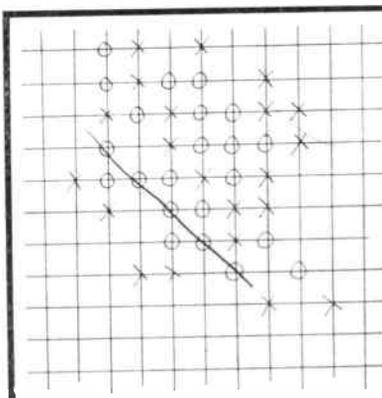
Japanese Noughts and Crosses

GO Moku', or 'Go Ishi', is a Japanese improvement upon our traditional pastime of 'Noughts and Crosses'. In Japan the game is reputed to be so popular that its enthusiastic devotees will stay up all night engaged in an exciting battle of wits. For 'Go Moku' is a veritable trial of skill, involving strategic styles of play and the employment of psychological methods to baffles your partner into making a false move.

By A. E. Ward

The game is played upon a 'board' comprised of nineteen horizontal parallel lines crossed by nineteen vertically drawn parallel lines. This arrangement can be rapidly improvised upon a scrap of paper before the game commences. The two players decide upon who will be 'nought' and who will be 'cross', as in our English game. However, the symbols

will be drawn at the intersections of the ruled lines, and not within the square meshes.



A round ceases when one of the players manages to achieve an unbroken row of five symbols, either horizontally, vertically, or obliquely placed. Subsequent rounds are begun by

the winner of the preceding round, and the game usually continues until one player reaches a prearranged total of wins.

Beginners will soon discover that rounds tend to be of brief duration, so, perhaps, it will be possible to play several games upon one board, but accomplished players of 'Go Moku' may invariably need the greater part of the space available. It is quite permissible to start a game upon a board of reduced dimensions, and to append new lines, as required, until the maximum of nineteen lines each way is reached.

Skilful players may feel the need for a few further rules that will add interest and zest to the game. A rule in force in Japan prohibits any player from putting his symbol where it will complete two unbroken rows of three, as this deployment is usually impossible to defeat. You are at liberty to invent your own rules, providing that this is done fairly and with your partner's consent.

If 'Go Moku' intrigues you, why not mark out a permanent board upon cardboard or plywood, and use two sets of coloured counters or little wooden blocks as 'noughts' and 'crosses'?

The 6ft 'Pete' Dinghy



Designed by that well-known boat expert P. W. Blandford, 'Pete' can be made in either marine plywood or oil-tempered hardboard.

As shown, it is light enough to be carried by one person and is ideal for the angler, or as a tender to a yacht.

'Pete' is basically intended for rowing, or sculling over the stern, but a small out-board motor can be installed, or a small sail can be fitted.

Plans for this pram dinghy, with shaped parts shown full-size, are available price 11s. 0d. (post free) from

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Gardener's Notebook

AWAY WITH WEEDS



LEFT without any attention whatever, a well cultivated garden will become a wilderness in a matter of months. Weeds will become abundant in weeks or even days in the right conditions, and it is during the early stages of their development that the job is best tackled. It means far less work when the weed seedlings are tiny than when they are well developed.

Use the hoe

Try to use the hoe in the vegetable and flower garden when weed seedlings are seen to be emerging from the ground. An hour of sunshine will kill the disturbed seedlings outright. Larger weeds, particularly the perennial type, will take much longer to die and may eventually root again if the weather turns dull and wet.

Annual meadow grass

Annual meadow grass is often a problem, since even tiny plants produce seeds which germinate after the plant is dead. The secret is to hoe continually and kill them before they have a chance to seed. Incidentally tiny plants of this particular grass can be raked up and used for patching a lawn. This is not recommended for a lawn of fine grasses, but works quite well for the children's play lawn. Just roll the little plants into the bare patches and keep them moist for a day or two.

Lawn weeds

Your new lawn will undoubtedly have many tiny weeds, but you will find that these will be controlled by cutting when the lawn is mown. Persistent weeds like plantain, dandelion, daisy and clover may appear when the lawn is established and may be dealt with by 'Lawn sand' or a selective weedkiller. There are many brands of the latter on the market and all are effective if used

according to the makers' instructions. Some are sprayed on, some watered on with a can, and some are even included in a lawn fertilizer. The latest idea is an aerosol pack which you can use for spot treatment.

Pre-emergence

Many crops in the vegetable garden can be kept weed free during their early growth by means of weed killers which are applied at a critical period just before the plants emerge. Needless to say the makers' instructions should be carefully followed.

For grass control around fruit trees the growth can be checked by inhibitors which have a stunting effect upon the grasses. This is used to good effect by the latest addition to the range. When sprinkled along the edge it controls the growth for 8-10 weeks, making trimming unnecessary. It is called LEC (Lawn edge control). The other method of control consists of metal edging strips which are pressed in place.

Couch grass

This persistent weed has long resisted the efforts of the gardener to remove it,

but at last there is an effective control consisting of a weedkiller applied to the soil. Unfortunately it cannot be used in every situation, but it is at least effective on land that can be left uncropped for the required period.

Thistle and bindweed

These deep rooted weeds can sometimes be eradicated with persistent cultivation, but unfortunately the average gardener is not persistent enough.



The easiest way is to use spot treatment with a selective weedkiller. With bindweed an effective remedy is to dip the growing tips into a jar of selective weedkiller (see illustration).

Paths

For gravel drives, crazy paving and other uncultivated areas sodium chlorate can be used if there is no danger to nearby plants. This material will wash or 'creep' a considerable distance and is not recommended for use near growing plants.

With the latest weedkiller 'Weedex' little 'creep' is evident and it can be used near hedges with safety. The advantage of this particular brand is that one dressing will normally last the year round.

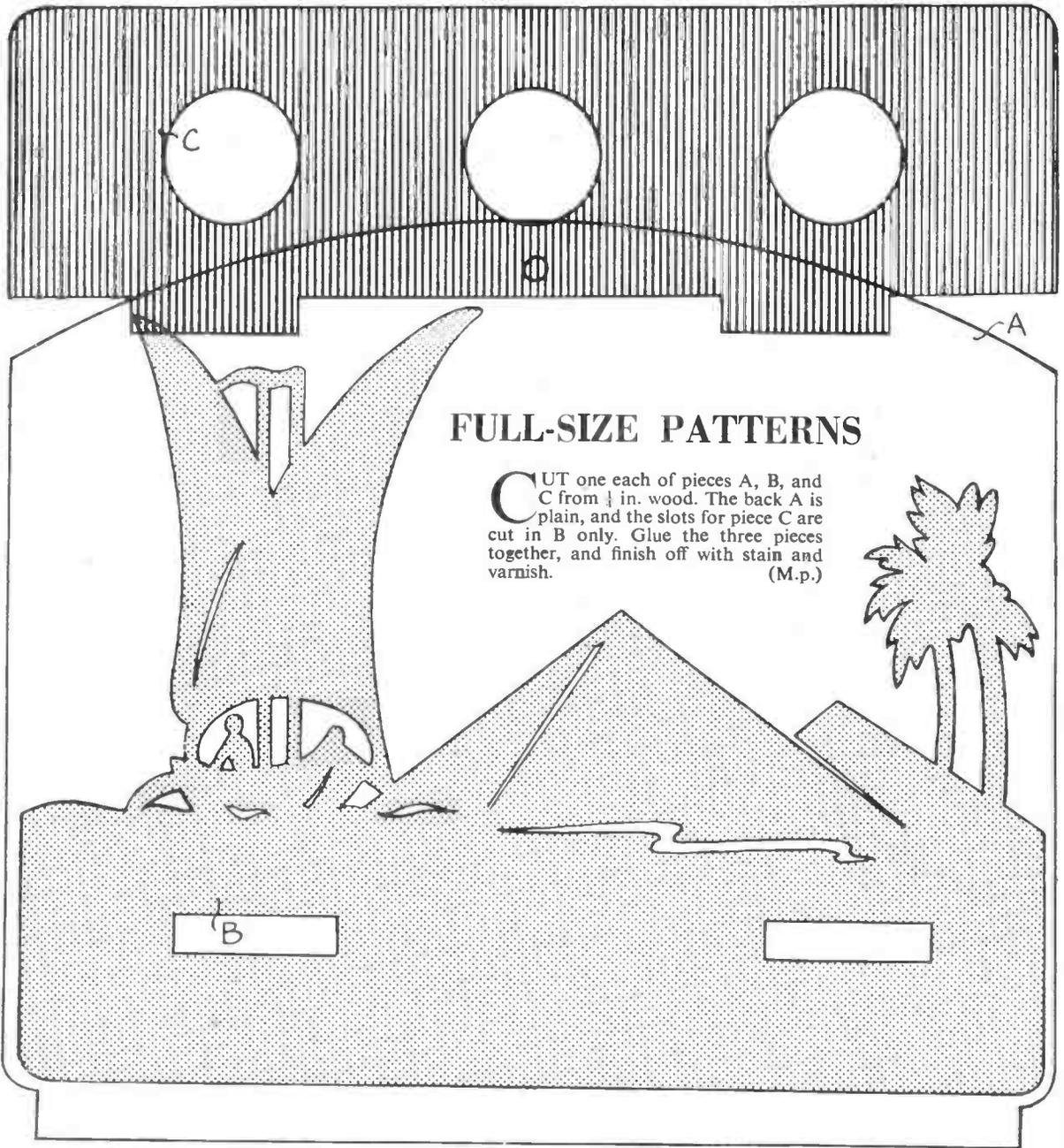
Finally, never allow the weeds to form seeds — remember the old gardener's adage — 'one year's seed — seven years weed'.

(M.h.)



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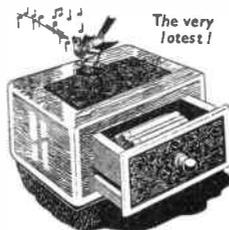
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