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THE ORIGINAL
'DO-IT-YOURSELF'
MAGAZINE

HOBBIES *weekly*

FOR ALL
HOME CRAFTSMEN

Also in this issue:

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RADIO DETECTORS

NOVEL WHITE ON
BLACK PICTURES

COLLECTOR'S CLUB

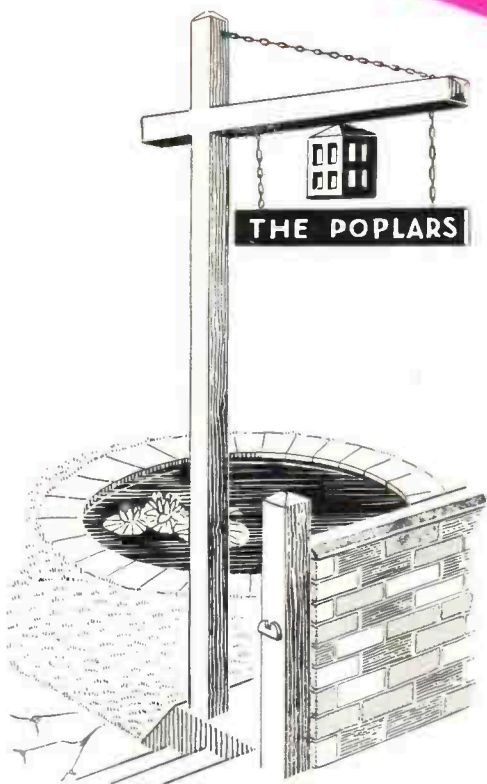
THE BREEDING OF
BUDGERIGARS

ENTERTAIN WITH
SHADOW MAGIC

HOLDER FOR A
POWER DRILL

PATTERNS FOR
LAWN QUOITS

ETC. ETC.



HOUSE SIGNPOST



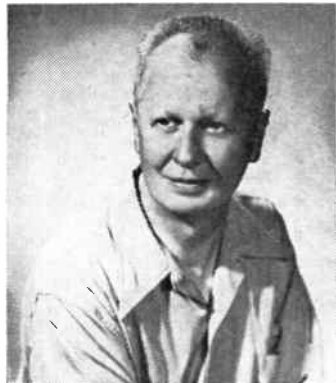
Up-to-the-minute ideas

Practical designs

Pleasant and profitable things to make

World Radio History

5^D



Joe W. Clancy

JOE W. CLANCY of P.O. Box 2162, Birmingham 1, Ala., U.S. America, writes: 'I am an artist and photographer. Stamp collecting and friendly correspondence are my main hobbies'.

Birmingham, 'Youngest of the World's Great Cities' and industrial giant of the South-east, was forest, farmland, and mountain less than 100 years ago. Today, more than half a million people live there.

Yes! Birmingham is an interesting place. So if you want to know all about it and also make a new friend, write to Joe. He will answer all letters.

12-year-old EDWARD STEPHENSON of 'Rose Cottage', Camblesforth, Selby, Yorks, is interested in radio, books, models and stamps.

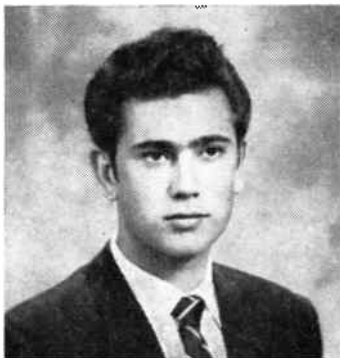
SKINDER PAL SINGH of Nai

Leck Than Chai, 488 Phaurat Road, Bangkok, Thailand, would like pen friends throughout the world. He collects stamps, match-labels, and cards.

MERWIN A. COPELAND of P.O. Box 168, Loma Linda, California, U.S. America, collects everything.

'I am enclosing a replica of an old Republic of Texas 3 dollar bank-note issued in 1840 while independent', he writes. 'I have many similar items for exchange.'

If you need stamps and labels from New Zealand write to MRS MARGARET J. MOORE, Avondale Station, Private Bag, Gisborne, New Zealand.



P. C. Smith of Malta

MR P. C. SMITH has sent some nice items from Malta. He needs English stamps and labels, and will send good value material in exchange. Send all letters to: 'Rose' Alley 2, Three Churches Street, Babzan, Malta, G.C.



3 Dollar note from M. A. Copeland, USA

THE first English lock was probably Egyptian! This sounds 'Irish', but the Phoenician merchants bartered Egyptian locks of rude construction for the tin of the Ancient Britons.

In the Middle Ages, locks for church doors were made in beautiful metal work. These were called 'Apostle' locks.

ABOUT LOCKS

On the front was a figure of one of the Apostles, and, on touching the hand of the figure, the bolts flew back.

Letter-locks were invented by a Dutchman in the fifteenth century. The principle of these was ingenious. They could be set so as to be opened only at a given word. Allusion is made in a play by Beaumont and Fletcher to —

'A cap case for your linen and your plate,
With a strange lock that opens with
AMEN.'

A word much used for the opening of these puzzle locks was John, spelt backwards.

A noteworthy piece of miniature work was constructed by an Elizabethan smith, Mark Scalist, who made a lock of eleven pieces of iron, steel, and brass, with a pipe key. The whole weighed only two grains of gold.

A poison piece

The Marquis of Worcester, who lived in Charles I's reign, invented a lock that reminds one of the poisoning period of Italian history. Then a hated guest might be asked to turn a key that pricked him slightly as he pressed it, and in a few days he would be dead. Based upon a similar principle the Marquis's lock possessed a steel barb which shot out when the key was inserted; but, in this case, it was only when a wrong key was used. Moreover, the barb 'caught the hand of the intruder as a trap catches a fox', so that it was a lock to be respected. Whilst the Marquis was experimenting with it, he had a taste of his own trap.

We should hardly call the padlock an article of adornment, but the natives of India and Africa have other ideas of beauty — they often wear necklets of padlocks.

HARRY BUGEJA of 6 Spring Street, Beverley, South Australia, would like to exchange stamps of any country. He is 23 years of age.

Crystal Detectors

ALL crystal sets use some form of crystal detector, which acts as a rectifier by allowing current to flow in one direction only. In modern receivers, a crystal diode is generally used, because it can be wired in exactly like a small resistor or condenser, and needs no attention or adjustment. Such detectors are fitted in many transistor and valve sets, as well as being used in crystal receivers.

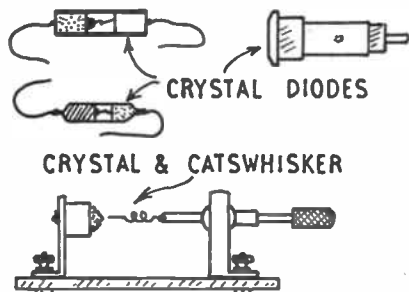


Fig. 1—Types of Crystal Detector

Three crystal diodes are shown in Fig. 1. Two have wire ends, and can be connected up by means of these. If soldering is used, the joint should be made quickly, and the wire ends left fairly long, or the heat may damage the detector. The third type of diode is fitted into small clips, which make contact with the metal ends. Leads must not be soldered to this type of detector, or it will probably be damaged.

Such crystal diodes are sometimes termed 'crystal valves', or are named according to the kind of crystal, which may be silicon, germanium, etc. For a crystal set, any new crystal diode will be satisfactory, and will last almost indefinitely, if not mis-used. Such new diodes are a little more expensive than used or surplus diodes, but will definitely be in good condition, so that the set works

properly. With used or cheap surplus diodes, reception may occasionally be poor, due to the diode being faulty. If so, a new one is required.

Fig. 1 also shows the old type of crystal detector. This has a cat's whisker fixed to a rod with insulated handle, which moves in a ball joint. The cat's whisker is moved about the surface of the crystal until a sensitive spot is found. This type of detector can give very good results, but has to be re-adjusted from time to time, by hand.

The headphones

The crystal detector cannot amplify, so a good pair of high or medium impedance phones, of the kind intended for use with crystal sets, will be needed, to obtain best volume. Poor phones, or headsets of low impedance ex-service type, will only give weak results, even if the crystal set provides a good signal. A phone matching transformer will improve matters with low impedance phones, but some ex-service types were intended to work at high volume (as in tank equipment) and because of this are so designed that they are not sensitive to weak signals.

With a good detector, and suitable phones, volume depends mainly on the aerial and earth. Though indoor aerials often suffice, an outdoor aerial will give better signal strength.

An earth connection is almost always essential, and the earth lead can be taken to a metal spike, water pipe, or other metal object actually in contact with the ground.

Crystal receiver

A circuit for a crystal set is shown in Fig. 2. The tuning condenser is usually $\cdot 0005\mu\text{F}$ capacity, and an air-speed condenser will give slightly better results than the solid dielectric type.

A ready-made coil may be used, or this can consist of about 80 turns of 32 s.w.g. or similar enamelled wire, on an insulated tube or coil former about $1\frac{1}{2}$ in. in diameter. With a short, poor aerial, the aerial connection can be taken directly to the detector. But with a fairly long aerial, tuning will be sharper if the lead is taken to a tapping on the coil, as in Fig. 2. This tapping can be at approximately the centre turn of the coil. Moving the tapping further towards the earthed end of the coil will sharpen tuning more, but reduce signal strength. The best possible tapping point thus depends to some extent on the aerial and distance to stations tuned in.

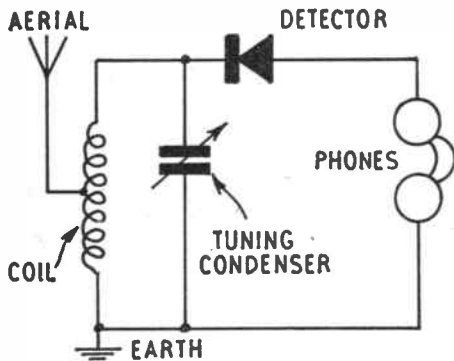


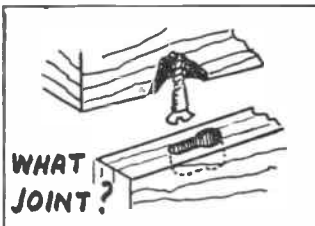
Fig. 2—Circuit for a Crystal Detector

TWO MINUTE

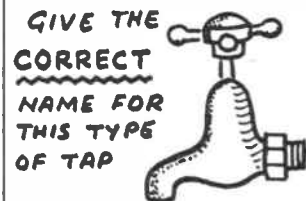
QUIZ

by Ed Capper

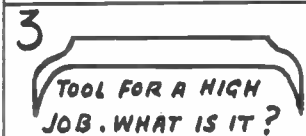
answers on page 202



WHAT JOINT?

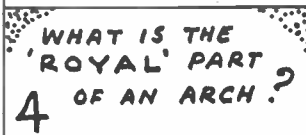


GIVE THE CORRECT NAME FOR THIS TYPE OF TAP



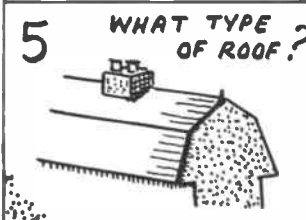
3

TOOL FOR A HIGH JOB. WHAT IS IT?



WHAT IS THE 'ROYAL' PART OF AN ARCH?

4



5

WHAT TYPE OF ROOF?

★ ★ ★ ★ ★ ★ ★ ★

★ Next week's free design will be for making a model of the famous ★ 'Oranges and Lemons' church in the ★ Strand, London — St. Clement ★ Danes. Make sure of your copy. ★

★ ★ ★ ★ ★ ★ ★ ★

WHITE AND BLACK PICTURES

HERE we describe how to make novel white on black pictures which closely resemble wood engravings or those made on scraper-board, but are not so difficult to produce. They can be made from any type of picture or photograph, ultimately using the photographic printing process for the final picture.

Only a portion of a picture need be chosen, and you are at liberty to omit a vast amount of detail or make suitable alterations or additions as may be deemed necessary. The method is also suitable for using photographs which may otherwise be considered as failures,

both are securely attached to the card-board.

Fig. 1 shows an original photograph of a pair of horses, and you will see that

By S. H. Longbottom

the background is most distracting. The enlargement made for the example of Fig. 2 was made in reverse — you will see the reason for this later — with the heads facing in the opposite direction. In

tracing the outline of the picture through the clear glass-like acetate. Do not apply too much pressure to the pen. You may make a blot, but do not despair, since the surplus can be scraped away with the point of a sharp knife if the ink is left to dry. One of the troublesome features of Indian ink is that it clogs the pen, but if you keep wiping the nib with a piece of spare rag, this will be overcome.

It will be found most convenient to start at the top, first making a complete outline, working towards the base of the picture. Details can then be added as the work proceeds, and it may be necessary to devote several sessions to the pro-

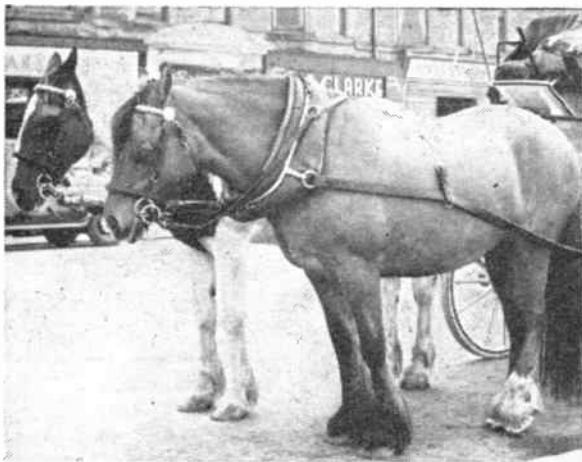


Fig. 1—The original

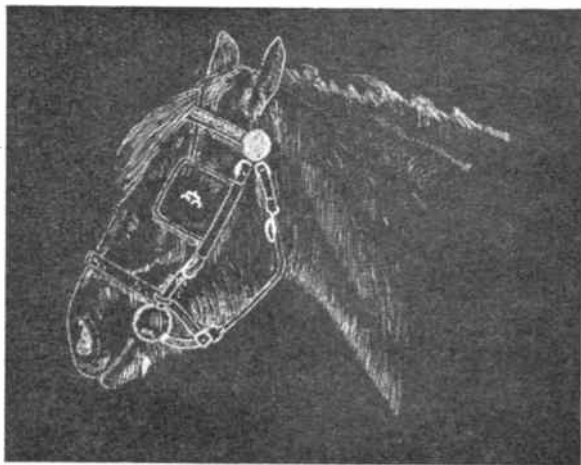


Fig. 2—The finished example

and a little experimenting will quickly reveal the many possibilities.

All we need is a picture or a photograph, some sheet cellulose acetate or celluloid, indian ink, and a pen for making what we may term the negative. The latter is finally used in conjunction with photographic printing paper.

If you use an ordinary picture the print will be reversed, but this can be avoided if you propose making your picture from a photograph. An enlargement should be made in reverse and attached to a sheet of stiff cardboard, which will also serve as a drawing board. This cardboard must be large enough to accept the picture plus a piece of cellulose acetate which is placed over the two, leaving a good margin, and attached by means of strips of Sellotape along two sides only. It is essential to keep this clear material in close contact with the picture, and neither must move out of position during the preparation of the drawing, so you must ensure that

the finished example you will observe that only one horse has been selected for treatment, some details altered for convenience and the entire background ignored.

Cellulose acetate is a little thinner than celluloid, and eminently suitable for preparing a pen and ink sketch, since every detail of the underlying picture is clearly seen. You must, however, guard against grease on the working surface, for this will prevent the flow of ink. You are recommended to first clean the material with a clean rag saturated in methylated spirit, working with a piece of blotting paper under the hand to prevent the transfer of any traces of grease from the fingers.

Indian ink is used with an ordinary steel nib such as Gillott's drawing nib number 303, which cost only a few pence. Mapping pens are inclined to splutter, and will not carry a large capacity of ink.

You should have no difficulty in

duction of the negative. Much depends on the size of the particular picture and the amount of detail you desire to include, but tests may be made at any time by slipping a piece of white paper between the picture and the acetate, revealing what progress has been made, and whether further attention appears necessary. This is why the acetate is not fixed to the card on all four sides.

With the drawing of the negative completed we are left with one which has no tones but black lines and clear spaces. When used with photographic paper we produce a print with a white image on a black background. We have already mentioned that Fig. 1 was reversed for the basic drawing, and the reason for this is that when we make the photographic print the inked surface is laid in contact with the sensitized surface of the printing paper.

We are now ready for making the final picture, and this must be done in the darkroom, using sensitized paper of

suitable size. Use a hard grade of paper with smooth matt surface. It is also advisable to use a yellow light, which will increase the contrast. This can be achieved by placing a piece of yellow cellophane over the enlarger lens if this happens to be the illuminant, or by using a yellow bulb.

The negative is laid on the sensitized paper — inked surface in contact with the emulsion surface — and a piece of plate-glass laid on top to ensure perfect contact between the two. These simple methods will ensure correct reproduction of even the finest lines in your drawing. Exposure will depend on the strength of the light, but it should be no more than will produce a good black to the background. For your guidance we may mention that using a 60-watt lamp through a deep yellow filter and bromide paper only two seconds were necessary for the accompanying pictures.

Fig. 3 shows some examples of different treatments. At A half a rectangle was painted with black ink and the L shapes scratched away with a needle. The other half was left clear and the L shapes added. An entirely different method was used for B, where the ink was spattered on the acetate in conjunction with a mask. The specimen C indicates a possible treatment for water or grassland, and it will be apparent that additional work can be done on the white areas after a print has been made.

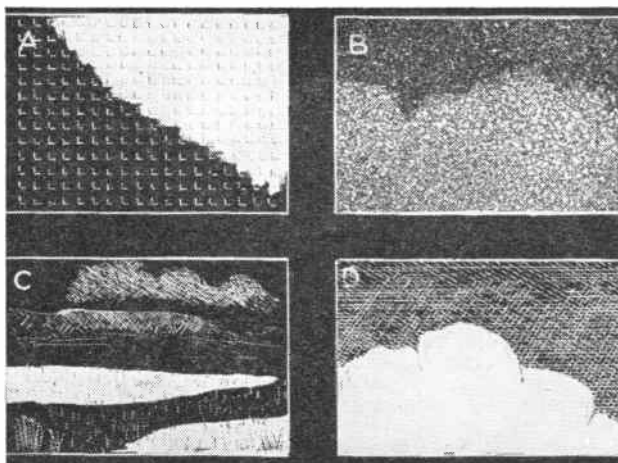


Fig. 3—Specimens of different textures

At D we show how to treat the sky portion of a picture, where the cloud area has been painted in black, fine lines scratched away for shaping, and the other portions ruled in with pen and ink.

It will now be realized that it is possible to lay a coat of solid black in some areas, scratching away clean lines as a modification. Discretion is required in such cases, but this is a most useful variation for grasses or areas of sky. The

instrument used for the scratching process is a needle embedded in a piece of dowel rod. Removal of solid black creates small particles of loose, dried ink, and these must be dusted away before making the print, or they will show as white spots.

If your final picture does betray such white spots in the background they can be removed by applying a touch of indian ink.

Inflating Balloons with Coal Gas

NINETEENTH century aeronauts often used coal gas, instead of pure hydrogen, to inflate their balloons. Coal gas can be used at home to blow up toy rubber balloons, if some arrangement is made whereby domestic gas pressure can be increased. An apparatus capable of doing this is not difficult to construct, and will be quite safe to use.

Your main requirements will be two lengths of $\frac{1}{4}$ in. internal diameter metal tubing, and a large football bladder or plastic beach ball. Take a piece of metal tubing, about 6 in. long, and bore a hole in the middle, somewhat less than $\frac{1}{4}$ in. in diameter. Then solder one end of a 3 in. length of the same tubing over the hole, to make a strong T-piece. The joint should be perfectly airtight. You may prefer to form your T-piece out of glass tubing, but your completed apparatus will not be so durable, because of the brittle quality of the glass.

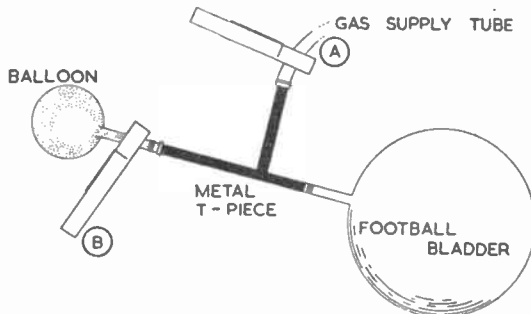
Fix the rubber bladder or beach ball to one arm of the T-piece, and bind the joint securely with string or wire. Join the stem of the T-piece to a gas supply

pipe by means of a length of rubber tubing. Again you must secure the joints by binding. Tie your balloon on to the free arm of the T-piece, using strong cotton or lightweight thread. Finally, you must place a clip upon each of the gas supply tube A, and the neck of the balloon B. See the diagram. Clothes pegs will probably serve as clips, or an obliging friend may use his fingers to pinch the tube and balloon neck at the proper moments.

Inflate the balloon as follows: Release clip A and then turn on the gas. The bladder will be come filled with gas. Turn off the gas, and secure clip A. Release clip B, and squeeze the bladder hard with your hands. The balloon will now be inflated. Close clip B, and repeat these instructions until your balloon is fully blown up.

Balloons inflated with

coal gas, to which paper figures are attached by long threads, will make exciting toys for children. Messages written in indian ink, and tied to coal gas balloons may rise to great heights and drift for hundreds of miles before descending. Air gun enthusiasts will find that ascending balloons make splendid targets, and coal gas inflated balloons, decorated with funny faces, will provide amusing party novelties. Be careful to keep your balloons well away from fires. (A.E.W.)



OUR FRIEND, the Budgerigar

YOUNG budgerigars are very precocious, and will endeavour to breed at three months old, especially if nest boxes are about. They should be prevented until they are nine months old. Even then they should only be allowed to breed between April and August, when the weather is more suitable for their offspring.

First, you will need nest boxes. An easily-made type is shown in the drawing. Dimensions should not be less than 8 in. by 6 in. by 9 in. high. The entry hole should be 2 in. diameter. A perch should be affixed immediately underneath.

3—BREEDING

Budgerigars do not need nesting materials, but lay their eggs in a hollow. The floor of the box should therefore be scooped out as shown. The floor should also be easily removed for cleaning purposes. The boxes should be hung as high as possible. It is important that they are placed at the same level. Otherwise cock birds will fight for supremacy in claiming the highest box.

Budgerigars are gregarious by nature, and a single pair may not breed. It can be overcome by (a) introducing another pair to the cage or (b) if the cage is too small, by placing another pair where they can be seen and heard by the others.

Plenty of green food should be available during the breeding season. Cuttlefish bone is also welcome, and these foods, together with the warm weather, do much to prevent egg-binding — a serious risk to the bird, especially in the cold weather. Also, a small quantity of cod liver oil should be mixed with the seed, to prevent constipation.

Once the hens are seen entering the nest boxes, you may expect eggs within a week or ten days. Only one egg is laid per day. Anything up to six eggs are laid, and as the bird sits on the eggs from when the first is laid, it will be seen that the young are born on different, following days.

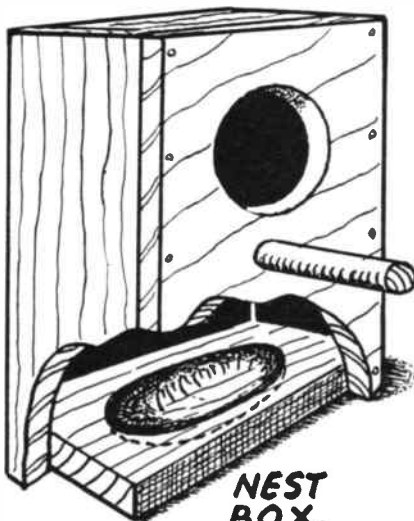
Incubation lasts 17 days. You can time it from when the hen seems to remain permanently on the nest, only coming off occasionally for food. When

the fledglings are born, both cock and hen bird will be seen entering the box to feed their young. At the end of a week there is no harm in having a peep at the youngsters, and removing any that have died.

Most hens keep their boxes spotlessly clean. Occasionally the opposite is met. In these cases, carefully remove the fledglings, clean the bottom of the box, sprinkle some sawdust over it, and return the babies.

The young birds will leave the nest at a month old. If they are strong and healthy they will fly straight to the nearest perch. Be suspicious of those that flutter to the ground. If it has all its wing feathers and tail, give it a second chance. It may be that it was too enthusiastic; was not quite old enough to fly. Pick it up gently, and return it to the nest box, when it will settle down quite safe for the night.

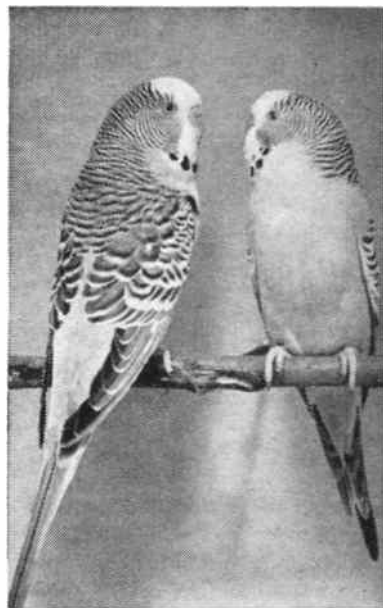
Young budgerigars can feed themselves immediately after they fledge. They will, however, flutter after their parents for a day or two screeching for food. A fortnight later their tails will have grown full length, and the black tip



**NEST
BOX.
CUT-AWAY SHOWS
EGG HOLLOW.**

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World Radio History



Blue hen left, green cock right. Pair mated by an expert breeder. Hen has very good head and back; cock comes from a very long line of brilliant greens.

to the beak, with which they were born, will have disappeared. They should now be moved to their own quarters if possible. They will not be harassed by older birds, and are happier where they can fend for themselves.

When the first broods have fledged, the hens will be seen to be incubating their second broods, the cock bird mounting guard on the perch underneath the entry hole on the nest box. The cock will take over the feeding of the first brood if they are still demanding to be fed.

About two months after they are born the young birds will appear rather ragged and unkempt. This is nothing to worry about; merely that they are beginning to moult into adult plumage. Also seen at this time is the changing colour of the ceres — bright blue for the cocks, rich brown for the hens.

Next: Colour breeding and ailments

ANSWERS TO QUIZ (see page 199)

1. Secret screw joint. The screw seats into a hole drilled underneath; 2. Bib valve; 3. Slater's roofing tool. Used for cutting and trimming roof slates. The two spiked ends are knocked into rafter for use; 4. The crown or topmost part of the arch; 5. Mansard.

AN ATTRACTIVE SIGNPOST

THE design for an attractive signpost for your house allows for plenty of variation in size and construction. For instance, the base of the post may be left plain, as shown in the main illustration for 'The Poplars', or may be boxed in with 1 in. thick wood and moulding, as seen in Fig. 1. The imitation lantern could be omitted and an all-weather lamp substituted. The latter could be controlled from the house. Size of timber, too, could be changed to suit your own requirements.

The post and arm are cut from 3 in. square timber, and are shaped at the ends and halved together. The upright post is let into the ground about 2 ft. 6 in., and is well packed with rubble and concrete to keep the sign rigid. The concrete may then be covered with an inch or two of earth, or may be extended up the post, as shown in the main illustration.

A detail of the halving joint is indicated in Fig. 2. The joint should be cut with a tenon saw and the waste re-

moved with a chisel. Apply plenty of waterproof glue and bolt securely together. The supporting chain at the top is attached to two eye bolts, as seen in Fig. 3, and the nameplate is suspended by chains from screws.

The top of the lantern is made from a block of 1½ in. thick wood, shaped as shown in Fig. 4. The sides may be of ½ in. marine ply or ¼ in. exterior grade hardboard. The fretted openings may be backed with coloured or pearl acetate. The lantern is attached by means of a screw eye in the arm and a hook in the top of the lantern.

If a working light is to be substituted it must be a suitable kind for outside use, and should be properly wired up by an electrical engineer.

The nameplate is 2 ft. wide and 4 in. deep. The letters may be painted on or may be purchased and screwed on. The latter method will probably be best if you are not too happy with the paint brush.

The chain should be chromium-plated. An alternative to chain is cord, such as is commonly used for linen lines. (M.h)



A STRIKING SET-UP FOR YOUR HOUSE NAME

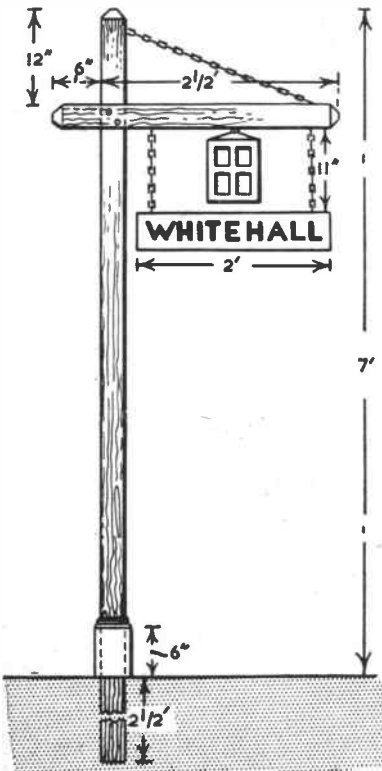


Fig. 1

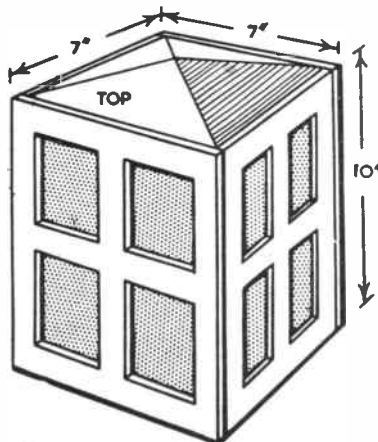


Fig. 4

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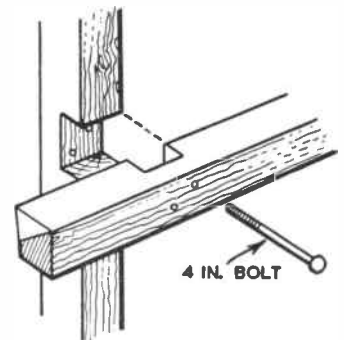


Fig. 2

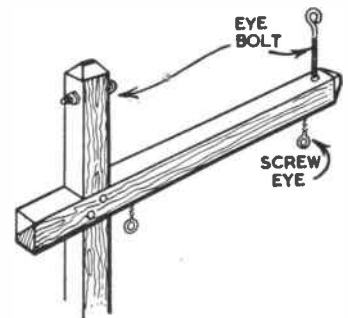


Fig. 3

Entertain with Shadow Magic

IN Victorian times, shadow shows were a popular form of home entertainment. To encourage the do-it-yourself spirit, folders of cut-out scenery and figures were sold in the toy shops.

There were sets of shadow puppets, mechanical shadow toys, complete shadow stages, and sets of silhouette figures mounted on thin cardboard. Almost every boy and girl, and many parents, knew how to create shadow rabbits, ducks, and geese.

By P. Davey

In fact, the art that was known to the Ancient Egyptians can be harnessed to modern needs. The surprise item at a party or social could be an impromptu parade of shadow animals. When the basic figures of hand manipulation have been mastered, then is the time to make a home shadow theatre, using a bed sheet or some other white material, stretched taut.

But it is best to start one's 'shadow education' by becoming expert at creating animal and human shapes. These can be practised on a wall, or on any other solid, flat, surface. In a sense, it is like playing the piano. To get the best results, fingers must be trained to be supple. At first, some of the finger positions may seem a little difficult. It will be found helpful to use one hand to put the fingers of the other in the right place. Some professionals use a fine rubber band to hold two or more fingers together.

Start with our friend the rabbit. When the screen stage is reached, a shadow name can be given to him by using a cardboard cut-out. But to make him recognizable, stand with your left side towards the light. Then extend the left hand in the light, palm upwards, back of hand bent over slightly. Next make a circle of first finger and thumb by touching the tips together. Raise the two middle fingers so that their tips point towards the ceiling. Bend the third finger towards you.

Your embryo rabbit now has a head, eyes, and ear. The right hand is employed to profile the front paws and hind legs. First, extending right-hand with palm towards the floor, point the thumb, then first and second fingers directly away from yourself. Spread them as widely apart as possible.

The third and little fingers should be drawn back against the palm. Rest the back of the left hand lightly against the

back of the right hand. Slide the right hand a little forward and upwards and — hey presto, a rabbit sitting on its haunches!

The fun really starts when you bring the rabbit to life. For instance, by wiggling the first and second fingers of the right hand up and down, the rabbit will appear to kick its front paws. Also, by moving the second and third fingers of the left hand, the rabbit will wiggle its ears.

Just as Punch and Judy entrances children and grown-ups alike, so will these fascinating little shadow shows amuse friends or acquaintances. A nursery rhyme about Mr Fox can best be illustrated by bringing that wily animal out of thin air, so to speak.

This figure only requires the use of one hand, with the left side of the body towards the light. Extend the right hand, palm uppermost, hold the fingers out straight, little finger at the bottom. Bend the first finger back until it touches the second finger just above the knuckle.

Second and third fingers should be extended and held together, no light showing between. The thumb is raised to form the animal's ear. The lower jaw is formed by lowering the little finger, taking care that the second and third fingers are not prised apart.

Once again, the still figure will come alive. Mr Fox will open and shut his mouth as you move your little finger up and down. Working the thumb will wiggle its ear, whilst moving the whole hand will make the animal leap at something.

Other animals such as ducks, geese, and a flying pigeon will quickly emerge from the shadows. As in other crafts, practice is the secret of success. Once the art is mastered by creating superb figures like a Red Indian (fingers extended widely to make the headdress), the next step is your own little theatre.

The screen is best when stretched taut in a wooden frame. Failing that, two heavy wooden rods may be used, the sheet being tacked to them top and bottom. In this way it can be rolled and unrolled.

A single light should be used, all others being turned off. It should be bright, as near to the floor as possible, and five to ten feet behind the screen. Establish the proper distance by moving the props backwards and forwards.

Also, a metal hood placed over the light bulb will help to confine its light to your screen dimensions. Coloured lighting effects may be obtained by placing painted glass slides in front of the light.



The whole shadow world is now at your disposal. Where humans do a play or pantomime, they must always be in profile. You can also accumulate a collection of cut-out props to present your little shows.

Get a writer friend to script your shows. And remember that record-player when you require background music!

REMOVING SCALE FROM KETTLES

Hard water districts suffer from deposition of scale in kettles. As this mainly consists of calcium and magnesium carbonates, it may be dissolved away by a suitable acid. The cheapest for this purpose is technical grade hydrochloric acid, which pharmacists sell under the name of 'spirit of salt'. Stir this into four times its volume of water, pour some of it into the kettle and swirl it around. Effervescence takes place, and the scale begins to dissolve.

When the action slackens pour out the spent acid and renew it. When bare metal appears here and there, pour out the acid and apply it to the remaining scale with a rag tied on a stick. Finally rinse out thoroughly, fill the kettle with water, boil up and finish by emptying and rinsing. Hydrochloric acid is corrosive to the skin, and any coming in contact with it should be flushed off with water, and a paste of sodium bicarbonate be applied for a few moments. (L.A.F.)

HOLDER FOR A POWER DRILL

A POWER drill left lying on a bench can be accidentally damaged by heavy tools, or knocked to the floor, breaking the power drill itself or any twist drill in the chuck at the time.

With the drill holder shown there is no risk of such a mishap. The holder is made entirely of timber and holds the power drill snugly even when fitted with any size of twist drill up to $\frac{1}{4}$ in. diameter. It also holds the chuck key, the

electric flex, and the plug. Two holes in the base allow for fixing on to a bench or wall.

Dimensions shown are suitable for a Wolf Cub drill, but they can be readily altered to suit any other make of power drill.

Two pieces of 9 mm. plywood $6\frac{1}{2}$ in. by $4\frac{3}{4}$ in., with the corners cut as shown, are used for the top and bottom. In the top piece a hole is cut with a fretsaw to take the body of the drill. To mark out this shape for cutting, unscrew the three

MATERIALS REQUIRED

- 2— $6\frac{1}{2}$ in. by $4\frac{3}{4}$ in. by 9 mm. plywood.
 - 2— 7 in. by $3\frac{1}{2}$ in. by 9 mm. plywood.
 - 1— $3\frac{1}{2}$ in. by $2\frac{1}{2}$ in. by 3 mm. plywood.
 - 2— 7 in. by $3\frac{1}{2}$ in. by $\frac{3}{4}$ in. timber.
- Glue and nails.

screws clamping the front to the body of the drill, and use the truncated drill as a template. Alternatively, a piece of pliable wire can be bent around the drill to get the shape.

A $\frac{3}{16}$ in. diameter hole is also drilled in the top to take the chuck key. A $\frac{1}{2}$ in. diameter hole is drilled $\frac{3}{4}$ in. in from the edge and a $\frac{3}{8}$ in. wide slot is cut in from the edge to meet this hole.

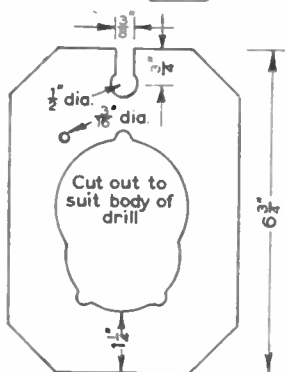
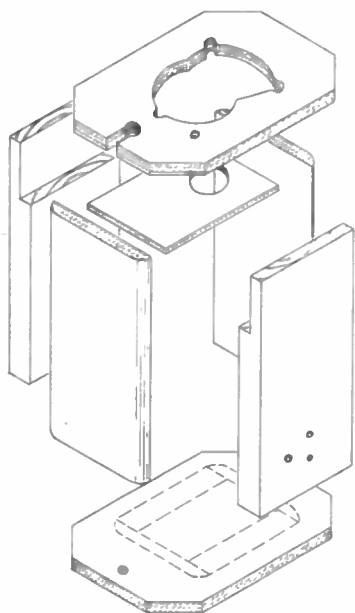
In the bottom piece two $\frac{3}{16}$ in. holes are drilled and countersunk. These are to take the screws for fixing the holder on to a bench top or horizontally on to a wall. A $3\frac{1}{2}$ in. by $2\frac{1}{2}$ in. platform of 3 mm. plywood is drilled $1\frac{1}{2}$ in. diameter to suit the collar of the drill. The tops of the 7 in. by $3\frac{1}{2}$ in. by $\frac{3}{4}$ in. timber sides

are sawn down as shown to provide a seating on which to glue and nail the plywood platform. The front and back are of 9 mm. ply, size 7 in. by $3\frac{1}{2}$ in. All parts are glued and nailed together.

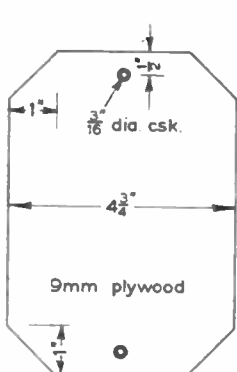
With the drill in position in the holder, coil the flex around the body of the holder, mark the positions of the plug pins, and drill holes to correspond to their size and spacing.

All nail heads should be punched below the surface and the holes filled with plastic wood. Glasspaper all surfaces and varnish or paint as desired.

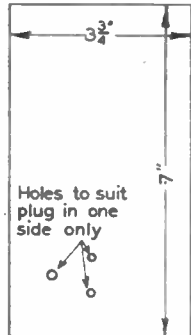
(J.A.L.)



TOP

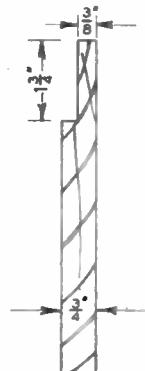


BASE

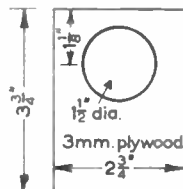


ELEVATION

SIDES



END VIEW



PLATFORM

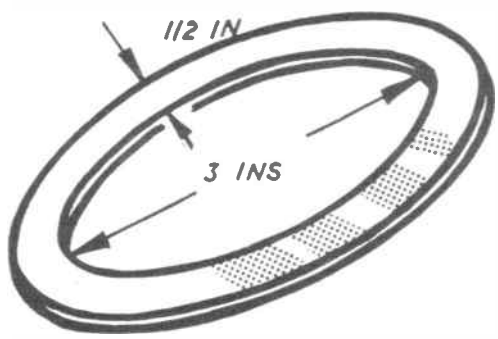
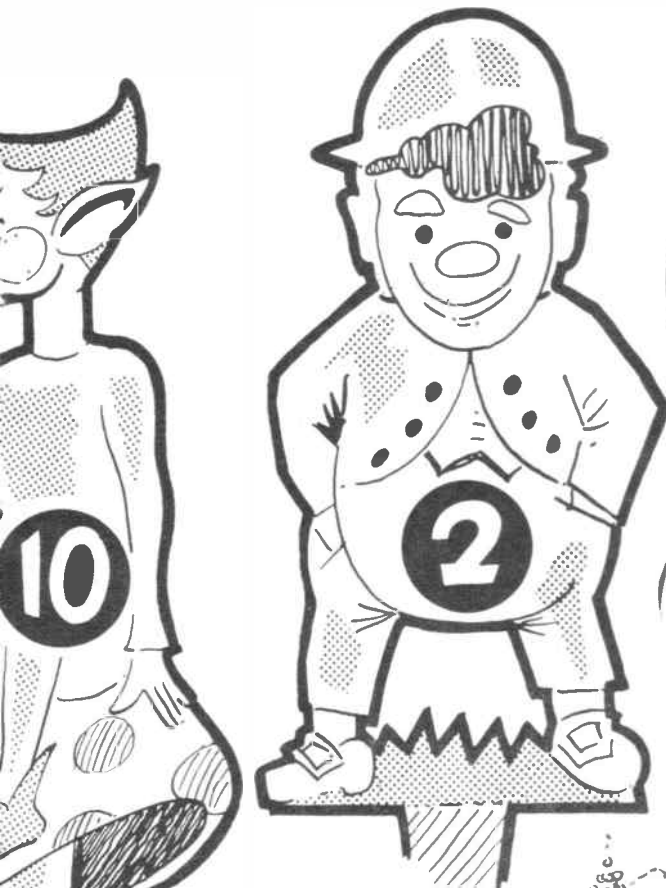
LAWN QUOITS

A GAME FOR ALL THE FAMILY

CUT TWO OF EACH
FROM PLYWOOD



THIS POINT
ADDED
TO
ALL
SHAPES

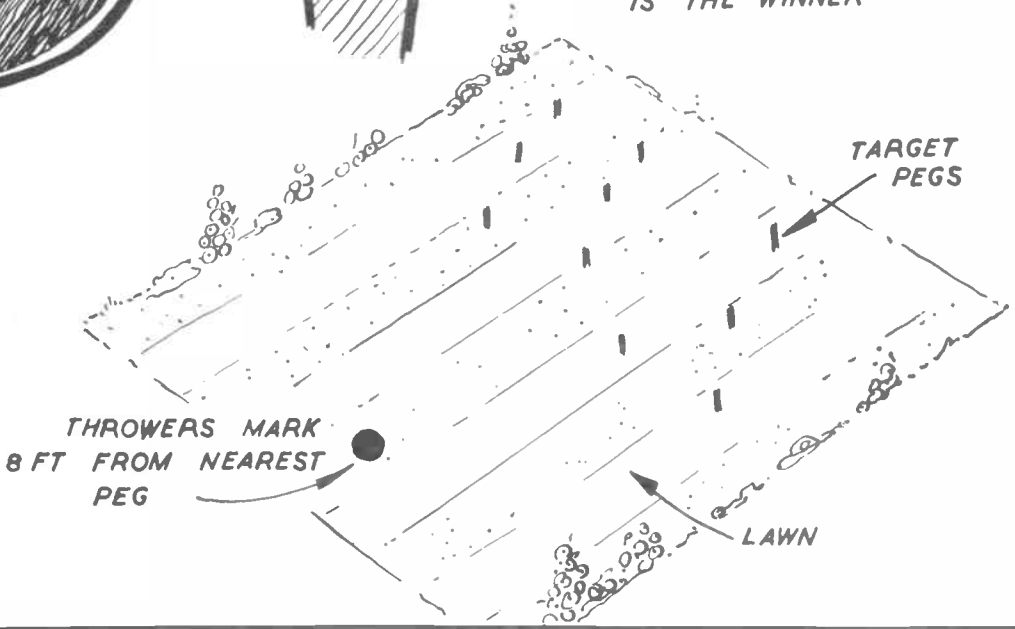


QUOITS CUT FROM
HARDBOARD FIVE
REQUIRED

PAINT TARGET PEGS
WITH BRIGHT ENAMELS

THE THROWER WHO
OBTAINS HIGHEST SCORE
WITH FIVE QUOITS
IS THE WINNER

INSERT IN GROUND



FIXINGS TO WEAK MATERIALS

WHEN fixings are required to be made to thin and hollow materials such as glass, hollow blocks, plasterboard, etc., special devices must be used. The following notes describe a few of the most common devices available which are suitable for such jobs.

Spring toggles

This device consists of a screw with two spring operated arms at one end. When in use the toggle is inserted into the material and once the arms have passed into the cavity behind they are designed automatically to spring outwards. The screw is then tightened up and the arms act as a nut which spreads the load over a larger area, as shown in Fig. 1. This is a particularly good type of device to employ when making fixings to lath and plaster, plasterboard and similar materials which are in themselves of low structural strength. It is necessary, however, to ensure that the space or cavity behind the material is sufficiently large enough to accommodate the toggle and the screw. Note that the item being fixed is hung on to the screw before the toggle is inserted so that all that remains to be done is to tighten up the screw. This type of device is not suitable for fixings to glass, and sheet metal.

Gravity toggles

The principle of this type of toggle is

similar to that of the spring toggle except that this type opens up by its own weight and not by springs. The device consists of a movable metal bar suspended on the end of a fixing screw. The illustrations at Fig. 2 show how it works. As in the previous method a hole is made in the material to allow the bar and bolt to pass through. At first the bar should be laid horizontal in line with the screw, but as soon as it passes through the material or enters the cavity its movable action causes the bar to fall vertically. The

By Finlay Kerr

screw is then tightened up, causing the bar to be drawn against the back of the material to serve as a nut. Gravity toggles are suitable for use on most thin and hollow materials except glass, sheet metal and lath and plaster.

Rawlnuts

These consist of cylindrical lengths of tough composition rubber which have a thin flange at one end and an embedded brass nut at the other end. When the fixing screw is engaged with the nut the tightening action causes the rubber to collapse and be drawn against the back of the material to form a sort of rivet head as shown in Fig. 3. This blob of collapsed rubber at the back simply acts

as a washer for the screw and nut. Rawlnuts are capable of making fixings which are shake-proof, watertight and airtight. They are suitable for making fixings to plasterboard, plywood, insulating boards, glass, sheet metal, hollow clay blocks (into cavities) and hardboard. They are, however, unsuitable for lath and plaster construction.

Rawlanchors

Although the principle of this type of fixing device is good it requires the use of a special collapsing tool which no doubt limits its popularity. The device, however, is particularly suitable for fixings to soft wall boards because it has a serrated flange head which tends to become embedded in the material and thus increase the holding power of the device. The method of using Rawlanchors is illustrated in Fig. 4. The device is screwed on to the threaded mandril of the collapsing tool and pushed through the hole in the wall. The collapsing tool is then closed, which causes the sides to collapse and spread out against the back of the material. After this, the mandril is removed and the fixing screw inserted into the threaded portion. The tightening action of the screw causes the Rawlanchor to be drawn more tightly against the back of the material. Rawlanchors are not suitable for fixings to glass, sheet metal or lath and plaster.

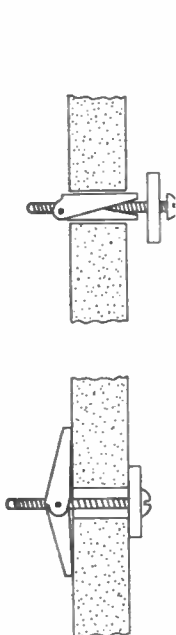


Fig. 1

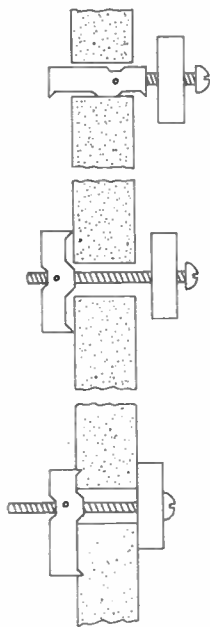


Fig. 2

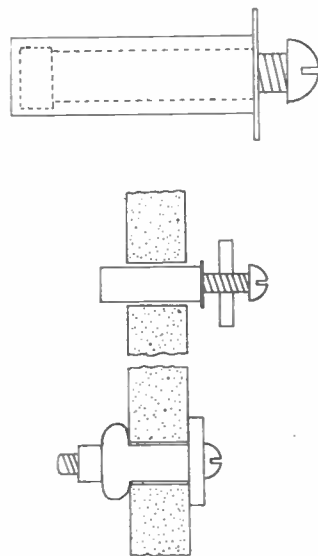


Fig. 3

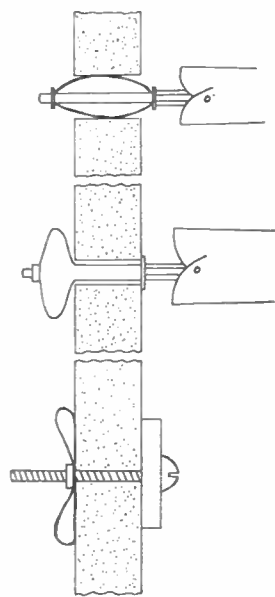


Fig. 4

MAKING A FUR RUG

NEARLY all married couples have at one time or another co-operated in the making of a rug for their home, whether it be by pegging cloth materials or wool — or, maybe, sewing with a machine. There is now available a rug-making kit, which uses yet another means of application — that is by Copydex adhesive.

Kits consist of a quantity of sheepskin pieces dyed in a variety of colours, or, if desired, in natural fur. These pieces are attached to a background by the adhesive, and there is sufficient quantity in each kit to make a rug of approximately 9 to 10 sq. ft. The shape of the rug undertaken does not matter so long as the overall area is borne in mind.

We tried out a kit which featured beaver lamb, and quite a good result was obtained from this first effort. Perhaps a little more care should have been taken in trimming and thus ensuring that the pieces fitted together more closely before fixing with the adhesive, but this is merely a condemnation of our own haste to get the rug finished. Nevertheless, after the rug had been in use and the 'pile' flattened over, gaps were not then apparent.

We also found that a further backing to the hessian on completion of the rug helped to give it weight, and thus keep it in place on the floor, although there is an alternative backing of rubber-backed felt underlay available which should not make this necessary.

The application of the skins to the backing with the adhesive was quite



Preparing to lay another piece of skin

simple and very effective, and this is a pleasant spare-time occupation which results in an attractive furnishing for any home. The job can be worked on singly or it can be a co-operative effort with two persons working at the same time, sharing the same source of adhesive, and thus enabling the job to be done much more quickly.

The real sheepskin pieces are dyed in delightful shades of pink, blue, and beige, and the natural skin kits (chiefly of beaver lamb) are in blacks, browns, and greys.

Kits and further particulars are available from Home Rugs Ltd, 1 Torquay

Street, London, W.2. The standard sheepskin kit costs 42/- and the fur rug kit is priced at 52/-. Alternative backings are offered, and further supplies of materials can also be obtained separately.

This same principle can also be applied in the making of delightful cuddlesome toys such as teddy bears, kittens, and ducklings, etc, kits for which are also available from the same source, complete with paper patterns. The coloured sheepskins, in particular, also lend themselves admirably to the making of a charming pram cover.

THE LEOPARD

THE leopard, panthera pardus, is found in Asia and Africa, but not in America, where it is replaced by the jaguar. The leopard or panther reaches a length of about 6 ft., and is a very powerful and ferocious animal. It is quite capable of killing a cow, and then carrying it over a 6 ft. fence.

As a general rule, in common with the other big cats, leopards do not attack human beings, but sometimes, as with lions and tigers, an individual animal will turn man eater, and can then be extremely dangerous. A leopard is not particular in what it kills, and will often kill more than it can possibly eat. They are expert climbers, and will pursue monkeys up into the tree tops; prey is also sometimes dragged up into a tree to protect it from other animals.



A fine study in our 'Peeps at Nature' series

There is a black or melanistic form of the leopard, popularly known as the Black Panther. This has been immortal-

ized by Kipling as the Bagheera of his Jungle Book. Black leopards come mainly from Java and Sumatra. (P.R.C.)

Transparent Lettering Stencils

STENCILS made from transparent materials are, undoubtedly, the best for rapid, precise lettering, and they can be made to conform with any style of type you choose. You will need a strip of stout celluloid or clear Perspex 1/32 in. thick, and long enough to accommodate an alphabet.

When making a stencil for 1 in. lettering your strip should be 2 in. wide, allowing a margin above and below the letters of 1/4 in. The letters should be evenly spaced along the strip, but note the following.

In Fig. 1 we show a series of thirteen shapes which will provide the outlines for the whole of the 26 letters of the alphabet, and it will be apparent that these are for clear block lettering. You may make 1 in. or 1/2 in. letters as you decide, or a series of the larger for capitals and smaller for the other letters. Such stencils will be exceptionally useful for preparing notices and the like.

Prepare the shapes by first drawing on a piece of white paper, ruling a pair of parallel lines for the letters, and leaving a 1/4 in. margin above and below, as stated. When this strip has been prepared, it may be temporarily attached to the strip of celluloid for cutting out. Place the celluloid on a hard surface, cutting out the shapes with a really sharp knife. The Perspex should be treated similarly, but it may be necessary to use a fretsaw. In

round a dowel rod, and trimming accordingly. For that matter, all the shapes should be smoothed with glasspaper after cutting, or the pen and pencil would not write smoothly.

By H. Mann

If the stencil is to be used for pencil lettering only, no further treatment is required, any inking-in being done after the letters have been written, but if you wish to use a pen it is necessary to raise the stencil from the paper surface to counteract any tendency to smear. Reference to Fig. 3 will show how to fit a thin strip of wood or cardboard, 3/8 in. wide, to both edges, ultimately binding with Sellotape. The wood should be stuck to the celluloid with a china fixative and allowed to dry, when the Sellotape may be attached as binding. These stiffeners will make the stencil much more substantial, and you will be able to write your lettering directly in ink without fear of making smears or blots.

It is sound practice to plan out any notice beforehand, using a straight edge. The stencil is laid against the straight edge so that the letters are correctly

positioned where desired on the paper, a word being printed by writing each letter in turn. This necessitates the moving backwards and forwards of the stencil along the edge of the straight edge. A tee square will be found ideal to enable the stencil to slide along horizontally according to the particular letter required.

It will be apparent from Fig. 1 that A, B, and D are quite straightforward, while such letters as C, G, and Q are prepared from shape 7. Shape 4 will produce the main outline for E, F, H, I, L, N or T — the latter being made by the top stroke with the stencil shifted for the down stroke; the centre strokes of E, F, and H are drawn in with the aid of a ruler. Shape 13 plus shape 6 will make the letter M, and similarly the letter W requires shapes 11 and 12. As mentioned, there are thirteen basic shapes, which are quite sufficient to make the entire alphabet if you use a little ingenuity.

Fig. 2 shows how to prepare a stencil for numbers, stiffened, and bound as previously mentioned, the size being decided by other stencils you make.

For other types of lettering you are recommended to refer to a textbook. You are warned, however, that some are much more difficult to cut, and will require much more patience. The plain block lettering shown in Fig. 1 is quite easy to prepare and easy to read.

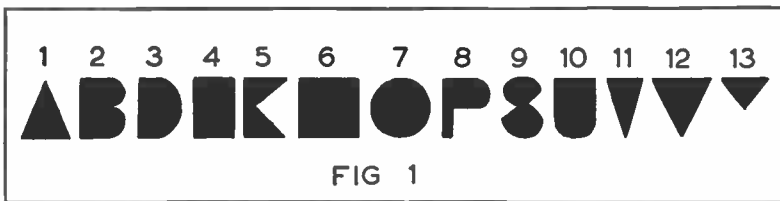


FIG 1

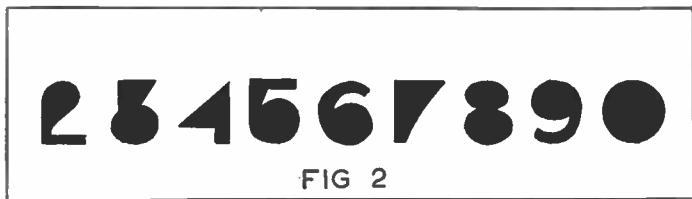


FIG 2

this case you are recommended to cut at a moderate speed, otherwise the blade may jam if the material melts by generated heat.

The rounded letters may cause you some unwarranted concern, as any difficulties are easily overcome by wrapping a piece of fine glasspaper

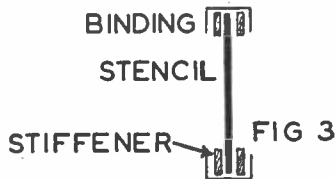


FIG 3

PLAYING CARD CALENDAR

A PACK of cards is a veritable calendar of information, with four suits that denote the seasons of the year, the red suits (hearts and diamonds) for Spring and Summer, and the black suits (clubs and spades) for Autumn and Winter. Backs and faces correspond with night and day, and each one of the fifty-two cards in the pack stands for a week of the year. In each suit there are thirteen cards, which equals the number of weeks in a quarter. If you count an ace as one, and a jack, queen, and king as eleven, twelve, and thirteen, respectively, the total for every card in the pack is 364. Add to this the joker, which you may count as one, and the final total will be the same as the number of days in a year. Modern packs contain two jokers, so there is even an extra card to represent leap year. (A.E.W.)



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WE now come to the study of the characteristics of the broadside view of the ships of the various periods. In some cases the full broadside view will be shown to give the hull shape from bow to stern; in others we will show only part of the hull to illustrate special features. In this section also will be given such details as are available of deck fittings and other items of interest to the ship model maker.

With the first of this series we studied the wooden ships of the ancient world and the types of bow, figurehead, etc. The differences between the ships of the ancient maritime nations were not so great in the general form of the hull as they were in the bow, stern, and decoration.

The Egyptian ships (Fig. 1), retained for a long period the form that was based on the first early boats built of bundles

of reeds and shown so plainly in Ancient Egyptian sculpture and pictorial writings. The style is also seen in some of their present day boats. The curve of these vessels is not regular, the angle of the forepart being higher than the after end. The midship frame, that is the widest part of the hull, is nearer the stern, and gives it balance and easy steering.

You will notice no sign of a keel in the vessels depicted in the sketch. This is because the Egyptians did not build on a framework of keel and ribs. A few light ribs were used, and the planks pinned to one another. The strengthening was supplied by the few deck beams from gunwale to gunwale, and these protruded through the sides of the hull.

To adapt the vessels in order to use them outside the Nile and for seagoing service in the Mediterranean, they later added the heavy rope truss, looped

around stem and stern, and passing along the centre line of the vessel, to prevent 'hogging'.

The only other nation of the same period who left any record of their ships were the Phoenicians, their merchant vessels being deep hulled, with straight stems and sternposts. They had flush decks to cover the hold. It is believed that one of these vessels, captured by the Romans, enabled their shipbuilders to design the Roman type shown in Fig. 3 at A. The Roman type shown at B is taken from an early sculpture.

WOODEN SHIP BUILDING—9

The Greeks were also one of the early maritime nations and, along with the other powers, began to develop ships for war purposes; thus came into use the war galley, a vessel that takes many forms.

In Fig. 4 we show Roman and Greek galleys and merchant ships from contemporary sculptures and drawings. Making allowance for artist's licence and the material used, vase, relief, etc, they do give us a good idea of the ships of the ancient world. In many cases they are our only sources of information apart from early classical writers.

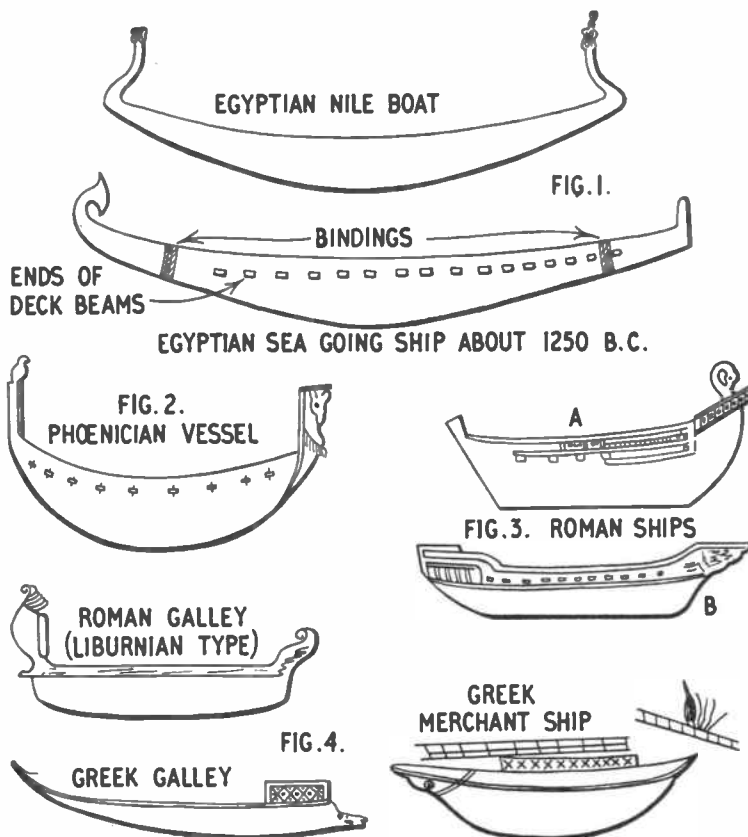
And now a word about materials. In later days oak, teak, and elm were used by shipbuilders, but the ancient world did not have this type of timber available. In the main, the hulls were constructed of pine for merchant vessels and fir for war ships. Cypress and cedar were also used. Some oak was available, as mention is made of the keels of large merchant ships being made of pine, selected with great care, and strengthened by false keels of oak.

In the interior of the hull, the old writers mention the use of such woods as elm, ash, acacia, lime, poplar, etc; oars, masts, etc, being of fir or pine. The seams of the hull were caulked with tow, or similar material, and tarred over.

The actual timbers were held together by wooden pegs (trenails) and metal was also used, in the form of nails, bronze being the favourite.

The outer hull was built on a keel and ribs, without a sternpost or stern, except in warships designed to carry a ram. The keel was curved upwards gradually to the level of the deck at the stern in warships, and at bow and stern in merchant vessels.

Planking varied in thickness from 2½ in. to 2 in., and rarely much above this standard, long wales being fitted outside the planking along the length of the hull. ("Whipstaff")





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...I to go over the wallpap...
...wish to make some plan...
...on the tan...
...mitter? (R.F.—Wolverhampton).
...Channel 10 would...

Replies to Readers

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...more.)
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...was made by fixing...
...board over a sto...

Static Generator

COULD you please tell me how to construct a cheap but efficient 'static electric generator'? (D.W.—Oxford)

THE most usual static machine uses one or two discs of glass or similar insulating material, rotated rapidly. Light pads of silk bear on the glass so that friction generates static electricity, which is collected as the discs pass by metal electrodes. This type can also be made up with a glass cylinder pivoted to rotate rapidly. A long pad of silk bears on the cylinder, and 180 degrees away, at the opposite side of the cylinder, a metal rod fixed to an insulator collects the electrical charge. Static electricity can also be generated by hand, an ebonite rod rubbed with flannel being most effective. A large charge can be accumulated by discharging the rod several times to charge up a Leyden jar (glass jar filled with lead shot with metal rod projecting). All static machines fail to work if damp, so experiments are best carried out in a warm room near a fire.

Radio Luxembourg fading

IHAVE a fairly old radio without an aerial and when I am listening to Radio Luxembourg it alters stations on its own so that I get a mixture of two stations. It also varies its tone without being touched. Could you please tell me the cause and how I can put it right? (G.B.—Northampton.)

THE station mentioned suffers from changes in volume arising with wavelengths around 200 metres, and also from phase changed due to reflections from the ionosphere. Modern receivers have automatic volume control to compensate for such 'fading'. This cannot usually be added to an old set. But if your set has a socket for an external aerial, providing such an aerial should improve results. The improved signal will also let the AVC system in the set function better, if such is present but not very efficient. Trouble from an interfering station arises from the lack of selectivity of the receiver. This may sometimes be improved by adding a wavetrap. This is only used with an external aerial. A trap for this purpose may be obtained from Osmor Radio, 418 Brighton Road, S. Croydon, Surrey. If your set has a frame aerial, turning the set for minimum pick-up of the offending station will much reduce interference.

Lighting Control Board

IAM constructing a control board for the lighting of a small stage, and wish to know if it would be possible to use surplus sliding resistors as dimmers. If this is possible, what resistance would be required if the supply voltage is 240V. A.C. and the total wattage of the lamps to be dimmed is 1,300? (R.J.—Bishop Auckland.)

A CIRCUIT carrying 1.3kW at 250V would need a resistance capable of carrying 5.5 amps. A sliding resistance of a maximum of 100 ohms would reduce the current by half and the brilliance to less than a quarter. This resistance would necessarily have to be large and safety precautions taken so as to radiate the heat away from the resistance. We suggest splitting the circuit into five separate circuits, with a resistance in each circuit having a value of 500 ohms each, and a current carrying value of at least one ampere.

Pick-up Amplifying

IAM building a small record player and I have come across a difficulty in connecting the two terminals on the speaker to the sapphire stylus needle. Could you please give me any help in this matter? (K.A.—Newcastle.)

THE output from the pick-up has to be amplified by an amplifier before it can work the speaker. The leads from the pick-up arm should go to the amplifier input sockets, and the speaker (with transformer if necessary) is connected to the amplifier output sockets. The type of amplifier depends on whether mains or batteries are used, and output needed. Mains operation is preferable. Radio and TV Components Ltd, 23 High Street, Acton, London, W.3, can supply amplifiers from about £2 10s. upwards. Radio Supply Co., 29-31 Moorfield Road, Leeds 12, can supply kits of parts for amplifiers. You might obtain the lists of these two suppliers.

TV Signal Strength

ISHOULD be grateful if you could help me with a problem regarding my television reception. When I have it on BBC with the aerial I made from your instructions, it is perfect. When the ITV started recently I got one of those 'Golden V' aerials which seemed satisfactory, as the picture is quite good (after I alter Brightness and Contrast). But the volume

of speech and music is a good deal less and the control has to be nearly full on. Is it harming the set by having the volume full on? (W.B.—Norwich.)

NO harm arises from having the volume control at maximum. It is unusual for BBC and ITV signal strengths to be equal, and adjustment of volume control, etc. is thus usually needed when changing from one programme to the other. As more directors are added to an aerial signal, pick-up is slowly improved. The positioning of an ITV aerial can prove very important, compared with a BBC aerial, and especially its relationship to roof, walls etc.

Painting a Canoe

IWISH to paint the underside of the hull of my canoe. I should be grateful if you could supply me with any data. (R.D.—Orpington.)

IF the hull is proofed canvas you can use ordinary household top coat paint on it. Alternatively, get a marine paint from a yacht chandler. Do not use an undercoat, which affects some proofing. Two coats should be sufficient on most canvas. Avoid giving too many coats, as a thick layer will crack eventually. Quantity depends on how much of the first coat is soaked up, but try a quart first. Price will be about 17/6.

Note: See back page for types of canoes available from Hobbies Ltd.

Removing Stains

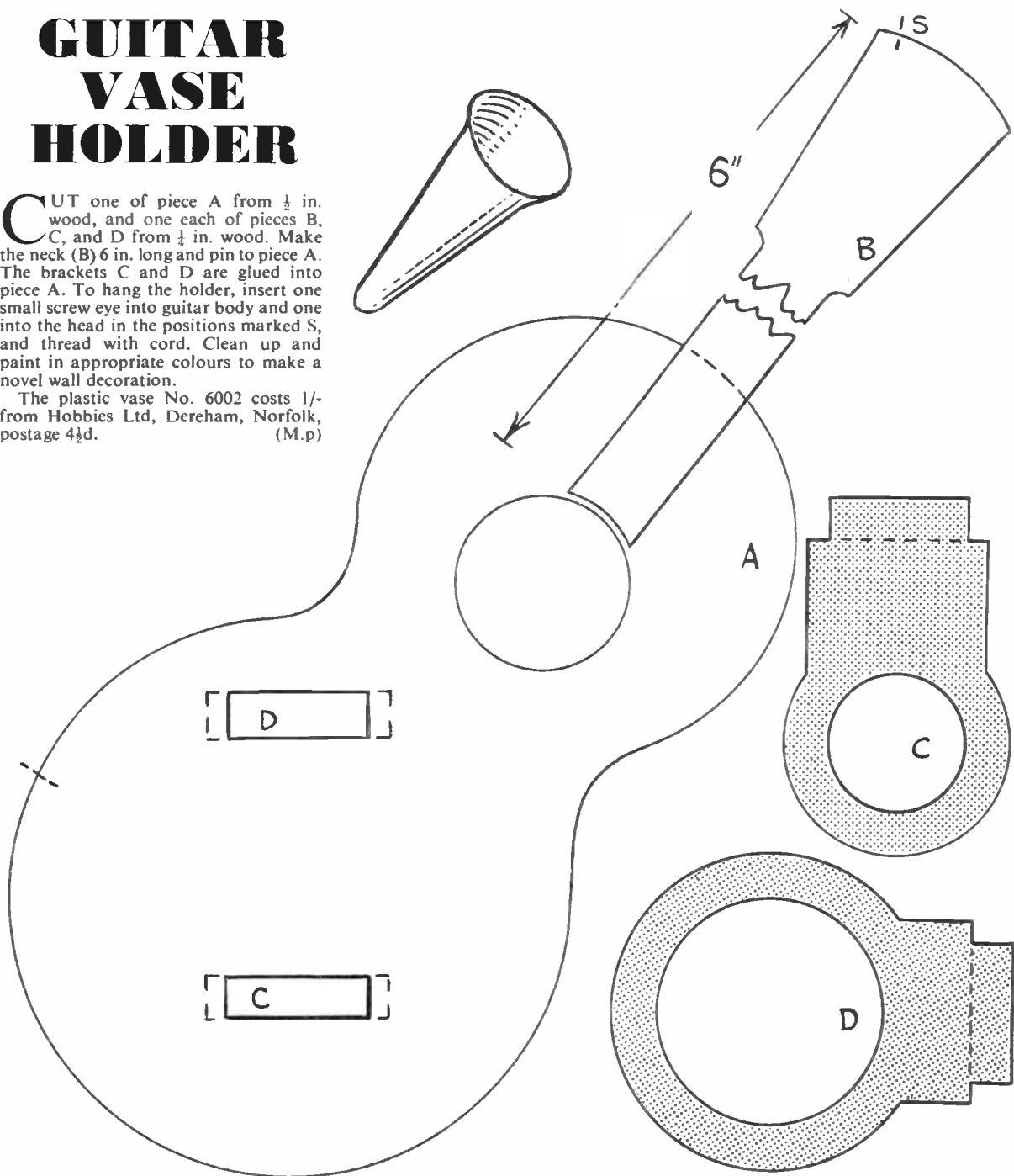
IAM renovating a sewing machine and I have made a table for it, which I wish to finish with a natural or clear polish. I want to re-use the present cover, but this is stained walnut and french polished. I would therefore be obliged if you could tell me how to remove the polish and in some way bleach the underlying wood. I have tried methylated spirit and removed some of the polish, but the stain eludes me. The wood on the cover is sapele-faced plywood and the table-top which I wish to match is beech. (E.B.—Stafford.)

WE do not think you will be able to make sapele plywood match beech in its natural colour. You have done right in using methylated spirit to remove the polish. The stain may be soluble in water, spirit or oil. As the methylated spirit has not removed the stain, try damping a part of the surface. If the colour comes off on the damp cloth, you may be able to remove much of the stain by washing with warm water. If it is an oil stain, it will have penetrated deeply and any attempt to remove it will result in patches. If you wish to try, experiment with petrol on an inconspicuous part.

GUITAR VASE HOLDER

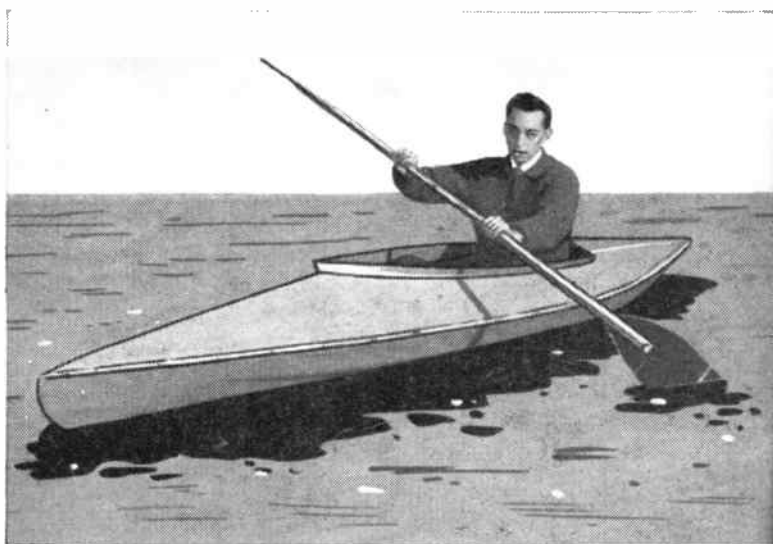
CUT one of piece A from $\frac{1}{2}$ in. wood, and one each of pieces B, C, and D from $\frac{1}{4}$ in. wood. Make the neck (B) 6 in. long and pin to piece A. The brackets C and D are glued into piece A. To hang the holder, insert one small screw eye into guitar body and one into the head in the positions marked S, and thread with cord. Clean up and paint in appropriate colours to make a novel wall decoration.

The plastic vase No. 6002 costs 1/- from Hobbies Ltd, Dereham, Norfolk, postage 4½d. (M.p)



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