





At the start of 1842 there was no such thing as a stamp in use in America. By 1875, stamps were used in connection with or on all mailings of any sort, including bulk mailings of newspapers and official Government mail. 'Postage due' stamps were introduced in 1879.

The first official stamps — a nickel stamp depicting Ben Franklin and a dime stamp with a picture of George Washington — were sold in New York City on July 1st, 1847. These stamps are now catalogued at £100 mint, £60 used.

Prior to the issuance of the first stamps, letters accepted by postmasters for dispatch were marked 'paid' by means of pen and ink or hand stamps of various designs. Such letters usually contained the town post mark and date of mailing. To facilitate the handling of the mail, some postmasters provided special stamps or devices for use on letters as evidence of payment. These stamps of local origin are known as 'Postmasters' provisionals'.

The 1846 five cent stamp of Annapolis depicting a bird is listed at £4,000. An 1845 ten cent value of St. Louis depicting two bears holding a shield is worth £110.

Up to 1845, the use of stamps was small. The universal use of stamps about 1860 produced two interesting effects. First and most conspicuous was the change-over to perforated stamps. But the earliest dates at which the various stamps are known perforated should be taken cautiously.

## CLASSIC STAMPS OF AMERICA

The other effect does not seem to be directly connected with the required use of stamps. But year-dated postmarks became plentiful, though far from general, almost exactly when stamps became compulsory. Curiously enough, year-date postmarking seems to vanish again in the 1860's and does not reappear till about 1880.

In 1865, the big Newspaper Stamps were issued for prepayment of parcels of dailies and weeklies. These stamps seem to have had a limited use. It has been suggested that they were used on packages of papers to be delivered directly to new dealers at stations or

rail lines or wharves on boat lines, when either carried mail. At any rate, these stamps stayed in use only to 1869.

The free franking of official mail ended on July 1st, 1873. Special stamps were provided for each Department, including a special 'Executive' series for White House Mail. These stamps are curious in one respect — they were not paid for in the usual way, but the quantities supplied to any Department were debited to it, and their cost transferred from the P.O. Department's books to those Departments involved. Thus their real purpose was as a book-keeping device to apportion postage costs to the various government services.

Special newspaper stamps were issued in 1875. But they were not affixed to the journals, whether mailed singly or in bundles. The system of cash payment for second-class matter was used. Instead of just handling cash, the postal service replaced it by these special stamps, which were affixed in the required amount to the mailing form presented with each lot by the sender. So these stamps did not arrive on the mail, and thus never became plentiful among collectors. This system lasted until 1898.

## The 'Whooping Crane'

THE American 'Whooping Crane' pictorial proved one of the most popular stamps of 1957. Fourth in the Wild-life Conservation series, it was released simultaneously at the Corpus Christi, Texas, and New York, N.Y., post offices on November 22nd, 1957.

The central subject of the design is a female whooping crane bending attentively over her two downy young, with the male bird in the rear, standing guard. The pair of whooping cranes are predominantly white against a dark blue background.

The chicks and the area immediately beneath them are yellow, blending into green grass in the foreground. The scene pictures the combination water and land areas sought out by this rare species for nesting and rearing their young.



# GARDEN TRELLIS WORK

**A**RCHITECTURAL features greatly enhance the appearance of the average garden. Trellis work, such as that shown on the front page, is so easy to make, and well within the capabilities of the handyman. The main thing is to decide upon a suitable design.

down hard, with a little concrete added, as shown in Fig. 2.

The trellis panels can be made up as indicated in Figs. 3 and 4. Use 1 in. by  $\frac{1}{2}$  in. wood, and make the panels in two or more sections. Laths can be specially cut to size if you contact your local

The top is shown in Fig. 5. It should be quite plain, as indicated, and should be the same width as the sides.

The posts and panels must be well creosoted before assembly. Secure the panels to the posts with  $1\frac{1}{2}$  in. nails, and put a loop of wire round the tops, to

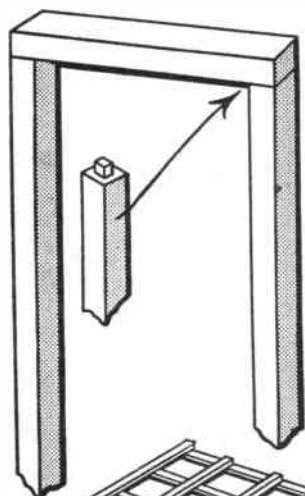


Fig. 1

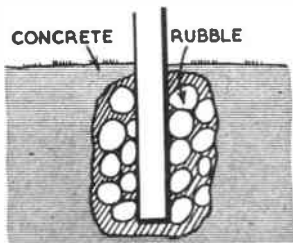


Fig. 2

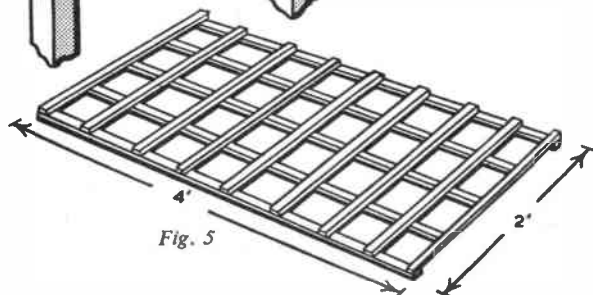


Fig. 5

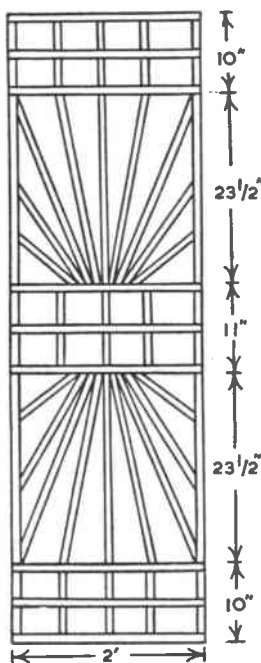


Fig. 3

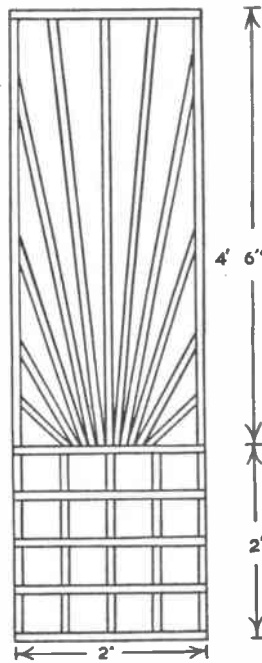


Fig. 4

Trellis panels, supported by posts and rails, are particularly useful for forming a screen between vegetable and flower gardens, and the obvious thing to do is to construct an arch for the pathway, so that climbing shrubs can be used to give a striking display of flowers during the summer.

The illustration shows how the arch may be used as a feature, at the end of a trellis screen, to link up the trellis, path, and, possibly, a low wall.

To ensure that the arch lasts for many years without attention, the main supports, to which the trellis is fixed, should be of oak. The sketch in Fig. 1 shows how the 3 in. square timber should be joined at the top. Give a coat of clear wood preservative, and a coat of priming before assembling the joint. This will help to keep the joint dry. The overall height should be about 6 ft. 6 in. and the width 4 ft. Creosote the bottom of the posts, and let them into the ground about 2 ft. 6 in. Fill with rubble rammed

timber yard, but some firms specialize in these materials, and the prices are a good deal cheaper. Use  $\frac{3}{4}$  in. nails for assembling, and turn them over on the back. The design may be modified to suit your own requirements.

secure top and sides together.

Suitable climbing plants such as honeysuckle, clematis, climbing roses, etc. may be used to cover the trellis, and provide blooms for your enjoyment during the summer. (M.h.)

## Making A Start with Marionettes

By Eric Bramall

**A**NY novice endeavouring to enter the field of puppetry soon finds himself beset by 101 problems, which, as likely as not, discourage him from continuing in this fascinating hobby. The puppeteer must be a painter, dress designer, make-up artist, woodcarver, stage manager, producer, and be also possessed of several other capabilities. Stage construction, lighting effects, etc. can be a problem to the beginner. And

then there is the all-important part — manipulation.

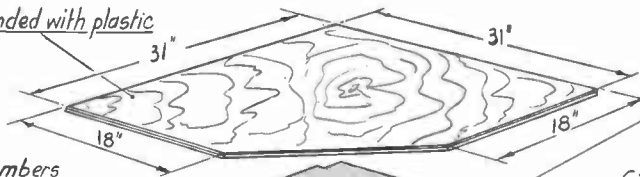
Anyone anxious to enter this highly interesting (and very often profitable) hobby, can most certainly benefit by studying this latest book on the subject. It covers all aspects in a clear and concise manner, and the many illustrations are crystal clear. The author, as Director of the Harlequin Puppet Theatre, Rhoson-Sea, North Wales, is a well-known authority on puppetry. Published by Messrs. G. Bell & Sons Ltd, York House, Portugal Street, London, W.C.2 — Price 12/6 net.





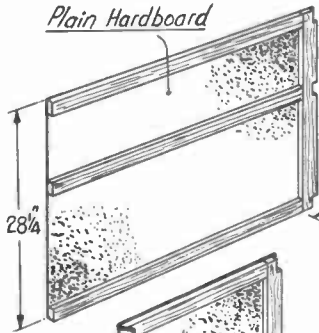
# Showing how the sections fit together

*Top 1/4" Ply bonded with plastic*



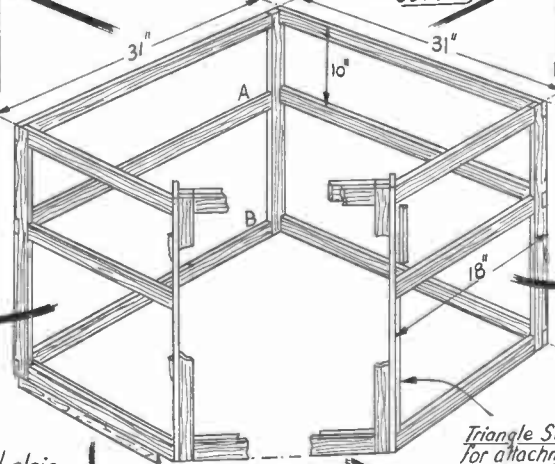
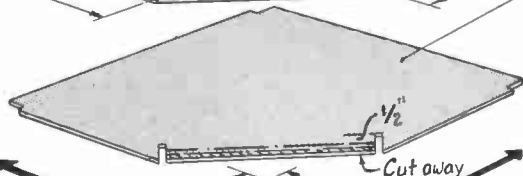
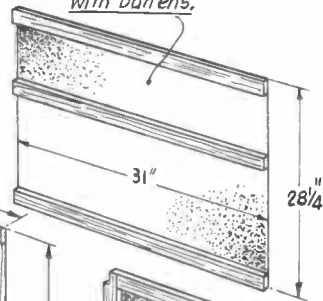
*Note:- All structure members made from 1 1/2" x 1/2" section*

*Plain Hardboard*

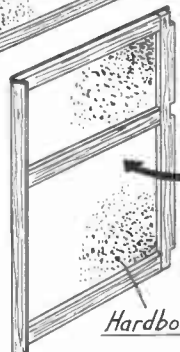


*Shelf - 2 Required  
1/4" Ply resting on  
battens at points A & B.*

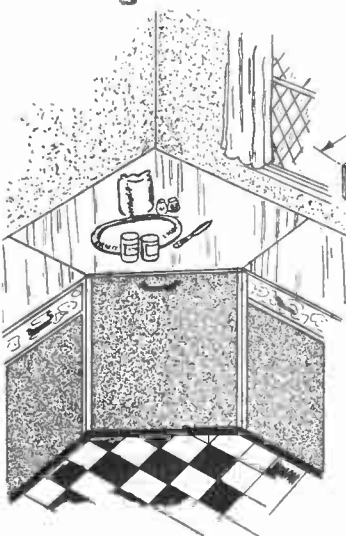
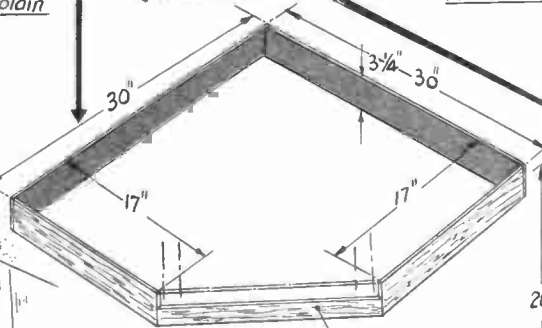
*Side Panel Hardboard  
with battens.*



*Hardboard plain*

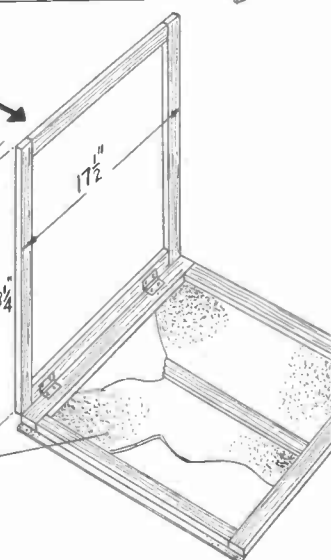


*Triangle Section beading  
for attachment of hardboard*

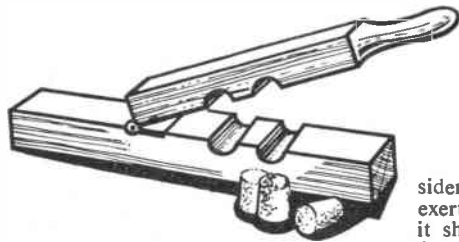


*3/8" Plywood Pinth*

*Reeded hardboard*



## CORNER CABINET



# MAKE A SQUEEZER FOR WINE CORKS

**T**HE home-made wine maker knows that in order to keep his stock in good condition all jars and bottles must have well-fitting corks. A good cork should be free from holes and flaws, and should be soft and pliable.

Nearly all new corks when bought from the shop are very hard, and require some sort of treatment before they are fit to use. There are several ways of doing this — some good and some not so good. Soaking them in hot water for a time will do the trick, but they will generally become hard again when they have dried out.

Rolling them under the foot is another way, although it is not a very hygienic method. The best way, however, is to use a cork squeezer similar to the one illustrated. The average handyman can make it quite easily, and it will well repay the little time taken to construct it. It can very well be likened to a large pair of nut crackers.

A piece of good hardwood such as oak or ash is best for the job. As a con-

siderable amount of pressure will be exerted during the process of squeezing, it should be substantial and also free from knots and similar faults.

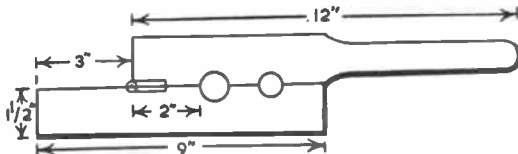
Wood about  $1\frac{1}{2}$  in. square will serve for both the base and the handle. Cut a piece 9 in. long for the base, while the handle is about 12 in. long. In order to obtain a firm grip, the corners are planed off the handle for a distance of 6 in., and finished by well smoothing with glasspaper.

Two or more grooves to hold the corks are cut in the handle bar, the first one being 2 in. from the end, and the next following with a space of

nearly half way. The next groove will be  $\frac{7}{8}$  in. at the widest end, tapering off in proportion. Other sizes can be made as space permits, if needed.

After cutting out with a gouge the grooves should be well smoothed with a file and then glasspapered. Grooves are now cut in the base strip to correspond with those already cut in the handle, but allowing for the projecting piece of 3 in. beyond the hinge. This is to hold the tool secure on the table with the hand, or it may be clamped down to make the job easier.

The squeezer is completed by flush-fitting a very strong steel hinge in the position shown. Some corks may want a considerable amount of squeezing in order to make them pliable; they will need turning round a little in between each squeeze. Very obstinate corks may sometimes be helped by soaking them



about 1 in. between them, and this one is somewhat smaller.

Most wine bottle corks are 1 in. diameter tapering off to  $\frac{7}{8}$  in., and the groove is made to hold this to a depth of

in hot water for a while before continuing with the process of squeezing. Very little hardening should occur when the corks have dried out and after they have been well squeezed. (A.F.T.)

## An exciting and skilful fishing game

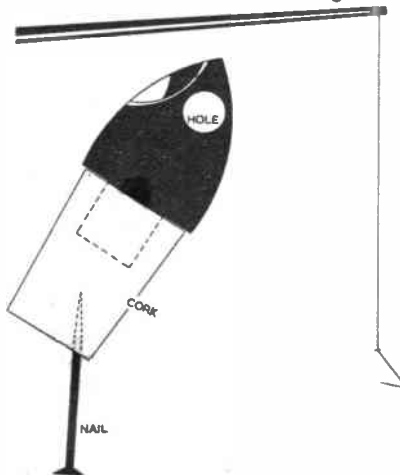
**Y**OU will need a steady hand and a good pair of eyes when you play this exciting fishing game of skill. Miniature fishing rods are used, and the object of the game is for any number of players to catch as many fish as possible within a certain pre-arranged time.

Use penny bamboos to make the rods, and to each one attach a length of strong thread to the end of which you have tied a bent pin to serve as a fish hook.

A dozen or more large corks will provide bodies for the fish. In the broader ends of the corks cut deep slots. Draw the heads upon strong cardboard in accordance with the illustrated pattern, and cut them out neatly. Make  $\frac{1}{2}$  in. diameter holes for the fishes' mouths, then fix the heads upon the bodies by inserting the projections at the bases of the heads into the slots in the corks.

Complete each fish by pressing a sizeable nail into the base of the body, but somewhat off centre. If this is done

correctly, the head will lean to one side when the fish is floated upon a bowl of water. Colour the fish with bright oil



paints.

Now you will be ready for your premier angling contest. Float the fish in a large bowl of water, into which a blue bag has been dipped to give an attractive effect, and distribute the rods among the competitors. When all have taken up their positions round the 'pond', let the game commence. After five or ten minutes have elapsed, the person with the largest 'catch' is declared the winner. It will be found amusing to time yourselves by means of an alarm clock.

An alternative method of play is possible if you write numbers upon the bases of the fish, using Indian ink. The game proceeds as already described, except that the winner is he who scores the greatest number of points as indicated by the values written upon the fish he catches. You may successfully adapt this game to provide a highly popular sideshow at a garden fête or other fund-raising event. (A.E.W.)



# MAKE A 'WINDOW' GARDEN

**W**INDOW boxes and tubs will not only provide bloom for most of the year, but they are easily tended, and can be enjoyed especially where garden space is limited. They can be made for an upstairs flat or a ground floor window, although when made for the former it is sometimes better to fill boxes with potted plants which may be removed for watering. The alternative is to fill with soil, sow seeds, or fill with various types of bedding plants or bulbs as the season proceeds.

Their construction is quite easy, involving nothing more than hammer and nails carpentry. Measurements should be taken for the length and width of the window sill, which will govern the size of the box, but 6 in. is a suitable depth. Sound  $\frac{3}{4}$  in. well seasoned timber is recommended for a box, but you may be able to obtain something suitable from an old packing case. When the box has been constructed to measure, drill a series of  $\frac{1}{2}$  in. holes for drainage purposes, about 5 in. apart, otherwise the soil will become sour. We must also provide the box with some feet to permit a circulation of air. These are made from  $2\frac{1}{2}$  in. by 1 in. material to fit the width of

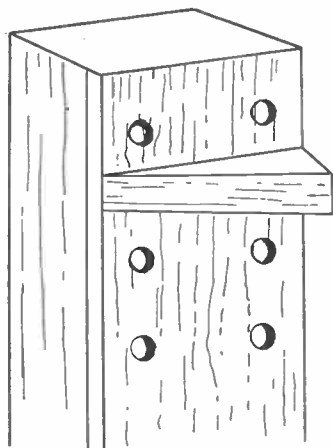


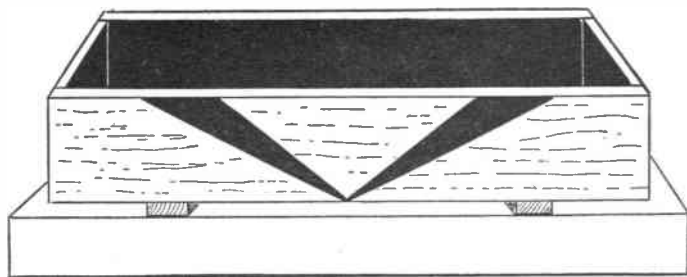
FIG 1

the box, tapering them if necessary to fit the angle of the window sill, as shown in Fig. 1.

Since the box is subject to almost continuous dampness we must endeavour to prevent the wood from rotting. You may use a good proprietary preservative that will not be injurious to plant life, but on no account should you use raw creosote. A reliable method is to char the wood by burning the inside surfaces. This can be done by applying a little paraffin with a brush, and throwing in a lighted piece of paper. When the surfaces have sufficiently charred, turn the box upside down to exclude air, and the flames will be extinguished. This operation must only be undertaken out of doors, and you are warned not to apply too much paraffin, or there may be an explosion. Another way is to place wood shavings and old paper in the box for firing.

Finally, we come to the question of decorating, and there is little doubt that painting is the easiest. The paint may match the existing decorations, or you may add a simple design, as shown in the finished job. Some window boxes are covered with fancy glazed tiles for easy cleaning, while others are faced with bark or half round larch poles. The addition of half round beading will make a pleasing pattern if arranged around the edges with a design in the centre, finishing with paint.

It may be necessary to secure the window box to the window frame, and if so, the solution is shown in Fig. 2. A pair of angle brackets have been suit-



ably bent, screwed to the box, and then to the frame. Remember to allow a little space between the box and the frame.

Add some broken crocks to cover the drainage holes to a depth of 1 in. On top of these place a layer of decayed leaves, chopped turves, manure or fibre to a depth of 1 in. or 2 in., completing the filling to within 1 in. of the top of the box with good loamy soil (Fig. 3). The latter should be reasonably fresh — not tired-out soil from the back garden — and it is a good plan to mix in two handfuls of bonemeal, which will act as a slow fertilizer throughout a season. The filling should be firmed, and allowed to settle before planting.

Window boxes can carry bloom throughout the year if some thought is given to planting. Always select dwarf varieties. In early Spring wallflowers, primulas, polyanthus, and similar flowers will last until the time for summer bedding plants. The latter can include pansies, violas, geraniums, nemesia, white alyssum or blue lobelia. Virginia Stock seed can be sown along the front edge to provide a colourful border.

When the summer flowers have gone, prepare for early Spring by planting crocus or daffodil bulbs and perhaps small evergreen shrubs. Apart from flowers, it is possible to grow radishes and lettuces in window boxes.

The position of the box in relation to sunshine will determine the frequency of watering, which should always be done in the evening. If rain splashes soil on to the windows, spread a layer of coarse coconut fibre on the soil. (S.H.L.)

FIG 2

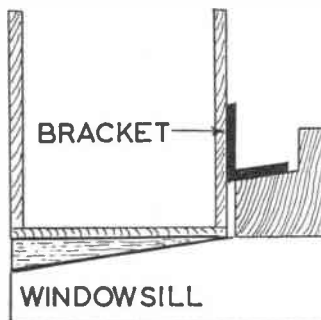
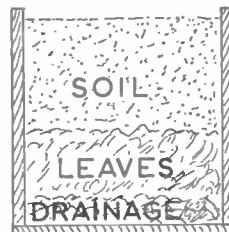


FIG 3



For those extra visitors

# A FOLDING PARTY SEAT

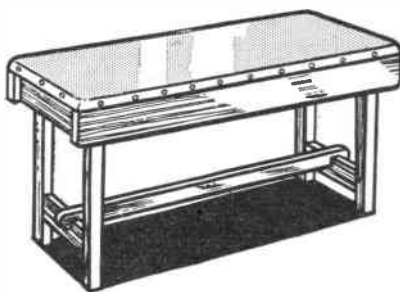
LACK of seating accommodation is often a problem at party gatherings. A good long seat, capable of holding three or four persons, can be of real use at such a time, especially if it can be folded up and put away when the party is over.

A front view of our design is given in Fig. 1, and a side or end view in Fig. 2, with suggested dimensions. The legs are fitted to fold inwards, so as to allow the seat to be easily stored away. When let out, a stretcher bar is fixed across the legs to keep the seat firm and stable.

Cut the long rails to length given in the cutting list, and, at the distance shown, groove across for the cross rails at each end, and at the centre. The grooves need not be more than  $\frac{1}{2}$  in. deep, and the rails should be glued and nailed across. Punch these nail heads down to a trifle below the surface. At points A and B, in Fig. 1, 1 in. square fillets are nailed across. Saw off the extreme corner angles at the ends of the long rails.

For the seat board, cut  $\frac{1}{2}$  in. plywood to the full length, and width of the seat, and screw to rails. Use flat-head counter-sunk screws. Divide the seat board into four divisions, roughly, with pencil lines, and in each division bore three holes with a gimlet, as shown in Fig. 3C. Now clean up the edges of the seat board and long rails to be level all round.

The construction of the legs will be plain from Fig. 4. Each pair are connected with cross rails as shown, simply



halved in and screwed or nailed. If the latter, then glue the joints as well. At the centre of each lower cross rail, saw out a

*By W. J. Ellson*

notch as shown, 1 in. deep, for the stretcher bar D.

Turn the seat over, and holding each pair of legs firmly against its respective cross rail under the seat board, fix the legs in place with a pair of 2 in. back flap hinges. These will allow the legs to be folded under the seat, and when opened out, they will butt up against the end cross rails. For the stretcher bar, cut a strip of 2 in. square wood to the same length as the seat. Lay this across the lower cross rails, letting it rest in the notches. With assistance from a friend to keep the legs out, and flat up against the

rails under the seat, mark with a pencil where they contact the leg rails, and there cut out notches 1 in. deep. A tight fit is desirable, and pressing the bar down in the notches should hold the legs firmly enough to ensure the stability of the seat.

A little padding to the seat board is desirable. A simple but quite effective method, calling for no particular skill in upholstery work, is as follows. Cut a piece of sheeting or close woven canvas a few inches larger than the dimensions of the seat board, and tack down one side to the front long rail. Now with a strip of  $\frac{1}{2}$  in. by  $1\frac{1}{2}$  in. wood under the material, tack down about 12 in. of the opposite edge of canvas to the back rail. A look at C, Fig. 3, will explain this. Remove wood strip, and then force the padding material (flock or kapok, perhaps) in the space between seat and covering.

Level the padding by application of the wood strip, working to an even thickness all over. Repeat this every foot or so to the end of the seat, then tack the ends down, and cut away all surplus. With a long stout needle, pushed through the holes in the seat board, make long stitches of twine to keep the padding from shifting about (Fig. 3, E). Cover the whole with a single layer of cotton wool to even out the surface, and then give a final covering of American or plastic cloth to finish off. Add a final touch by hiding the tack heads with matching banding, such as you can purchase from upholstery stores.

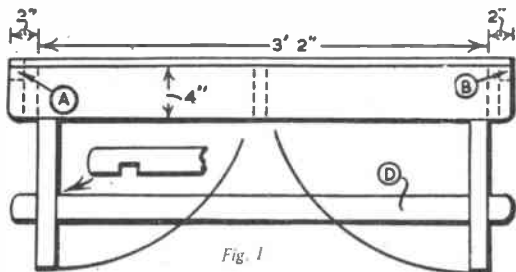


Fig. 1

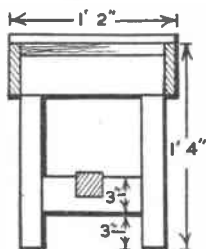


Fig. 2

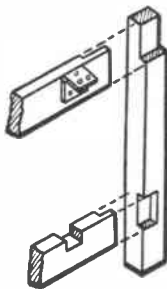


Fig. 4

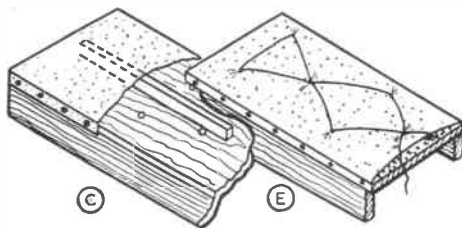


Fig. 3

## CUTTING LIST

Long rails.	(2).	3 ft. 6 in. by 4 in. by 1 in.
Cross rails.	(3).	1 ft. 0 $\frac{1}{2}$ in. by 4 in. by 1 in.
Fillets A and B.	(2).	1 ft. by 1 in. by 1 in.
Bar D.		3 ft. 6 in. by 2 in. by 2 in.
Seat board.		3 ft. 6 in. by 14 in. by $\frac{1}{2}$ in. plywood.
Legs.	(4).	1 ft. 4 in. by 2 in. by $1\frac{1}{2}$ in.
Rails.	(2).	1 ft. by 3 in. by 1 in.
Rails.	(2).	11 in. by 3 in. by 1 in.



Work for your camera

# OTHER PEOPLE'S HOBBIES

**P**HOTOGRAPHS of unusual and interesting models — whether mainly decorative or painstakingly accurate copies of the original subject — can add a touch of variety to your photographic albums. They can also widen your own interests, and bring you into touch with new friends — and sometimes add a little extra ready cash to spend on your hobby, photography.

There is almost certain to be someone in your district who models — in stone, metal, wood, cork, matchsticks. Ingenuity seems unlimited, as do subject matter and treatment. But in all cases there is a common denominator — pleasure and satisfaction in doing a job well. And there is rightly pride in a job well done — so when you make your request to photograph (and it is gen-

ing way. So your approach will depend sometimes on things outside your control — in others you'll be able to arrange the subject matter to your advantage for easier snapping. Each case, however, will benefit from a little forethought before clicking the shutter.

#### LIGHTING:

Unless you wish to produce some special effect very strongly, contrasty lighting is not generally suitable. But you need good lighting — you don't want a

consistent with the exposure you intend to give. At wide apertures of the lens sharpness falls off rapidly beyond the point actually focused on; the background becomes a blurred mass without distracting detail. But watch lighting conditions in this case. Patches of high-light and deep shadow in the background can be distracting in the final print, even though devoid of actual detail.

#### BACKGROUND:

This ties up with focusing. An against-the-sky shot gives little trouble. But indoors (or an inside shot with a normal background), may call either for some form of artificial background or for differential focusing. For a small, portable model an against-the-sky-shot usually means a low-level shot. You may not want this. Sometimes by standing the model on a shed roof, or wall, and by standing on a chair or folding ladder, an

## By E. G. Gaze

flat, uninteresting snap: a little contrast of high-light and shadow from side-lighting won't usually take you far wrong. But you don't want too much deep shadow — after all, while giving roundness and depth to the model, you do want to show its details. If taken indoors, watch for the too-dark shadows from a room light — a white card or sheet of paper held out of the picture area can lighten the shadow areas by reflecting light into them.

If taken out of doors, a high sun may be preferable to *strong* side-lighting — unless some sort of reflector is used. Perfectly even lighting, indoors or out, will tend to give a flat, lifeless result, but a cloudy sky with a strong gleam of light to throw soft shadows is often ideal.

Texture of the material used to construct the model is often a measure of its reality, and the ingenuity of the constructor. Soft side-lighting brings out texture.

If a model depends more upon its form and mass for interest, then lighting can be stronger. Deep shadows can add to the effect and reality, and interest.

#### FOCUSING:

It goes without saying that the model should be as sharply focused as possible. Because it may be quite small in size, don't go too close to get a larger image — this may give an effect of distortion to proportions. The effect of high-level, low-level, and same-level taking positions can produce different impressions. Try them all in your viewfinder, and, perhaps, use more than one.

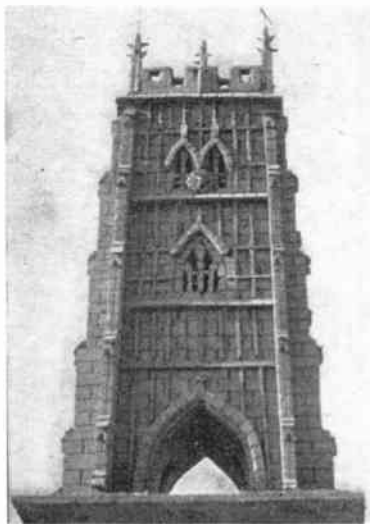
Focusing brings in the question of background — it's the model you want to depict, not the background. The model must stand out. You can use a backcloth of neutral colour, or sometimes, especially out of doors, you can achieve all you need by differential focusing. Focus dead on the subject, with as wide an aperture as possible



Same model taken nearer eye level, giving new view. Garden background thrown out of focus.

eye-level shot can be taken with a distant sky background. Even with sky backgrounds watch out for the odd pole, etc., which, though distant, appears in the final print to be growing out of the model.

And that extra ready cash to put to your hobby? Well, local newspapers are often glad of prints of interesting models made by readers, especially if the model is of some local object or building. But tell the owner you'd like to submit such prints, and get his agreement.



Ancient Bell Tower, Evesham Worcs., modelled in cork by Mr Lester., London.

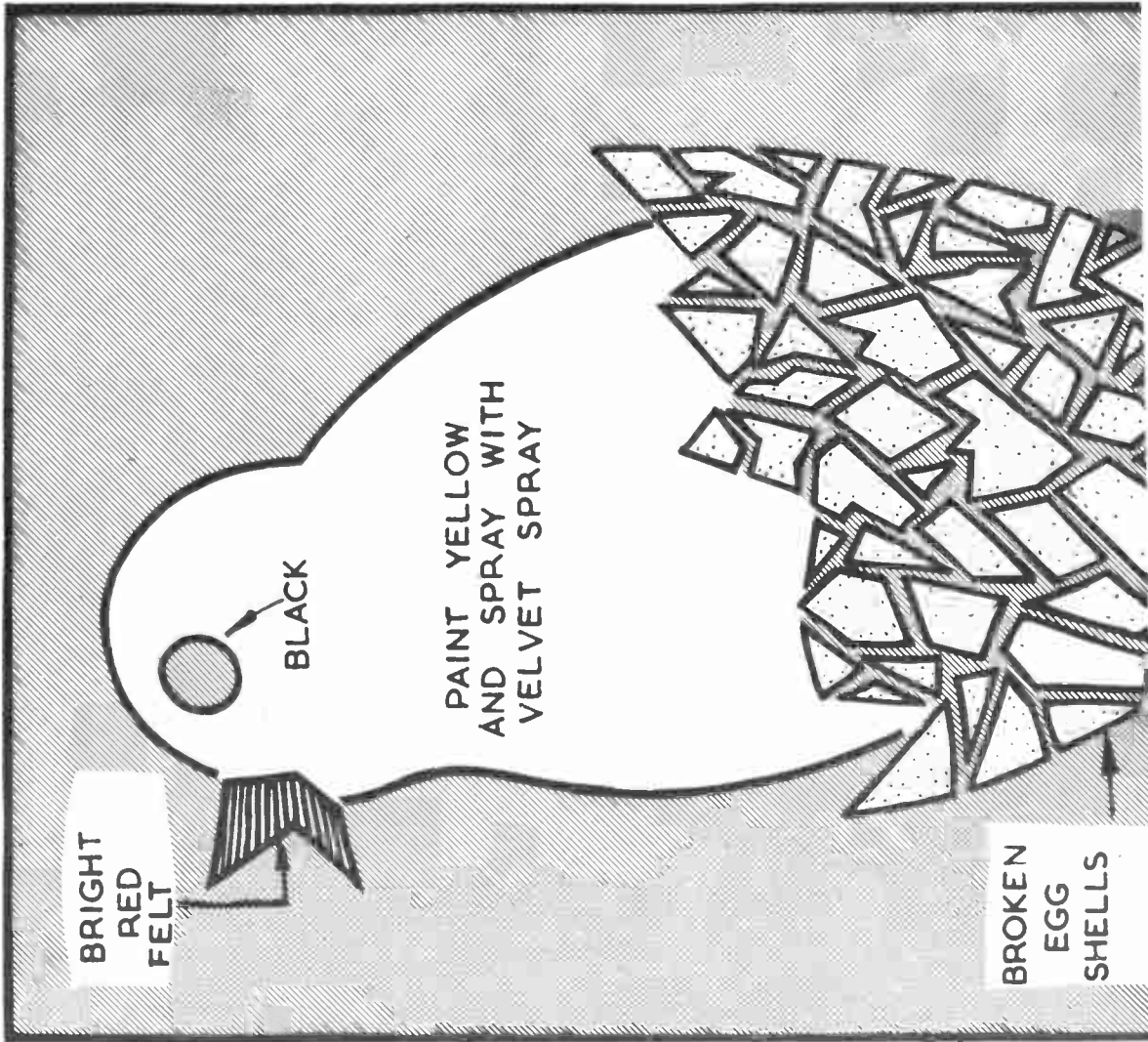
Low-level shot against sky.

erally freely accepted), don't just click the shutter at random, aim to make your snap a job well done also.

This article doesn't deal with photographs of models for working plans or manuals of 'how to make it', but with snaps for your own album. General interest snaps; snaps that can be taken with a little care and forethought, but without elaborate preparation of lighting conditions and backgrounds, and blocking out, etc.

By 'model' we generally think of something to small scale, and moveable, but, of course, it may be quite large, and 'fixed' — such as a wind-vane depicting a ship or aeroplane in a novel or interest-

# MAKE YOURSELF AN EAST



# ER PICTURE

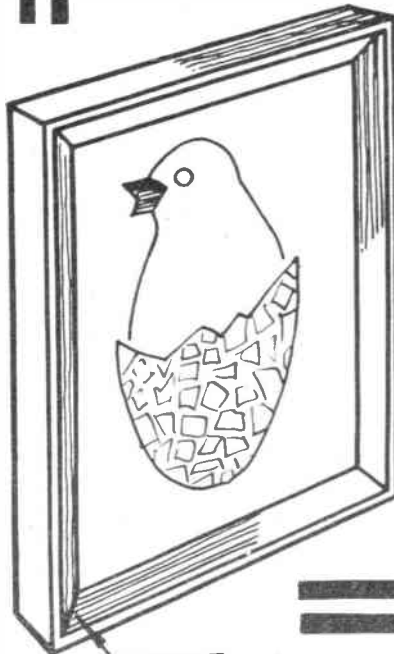
# THIS YEAR



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# CHEMISTRY AT HOME

**D**URING the fermentation of grape juice to make wine there separates out a discoloured solid known as tartar or argol. It consists of crude potassium hydrogen tartrate. After removal of the impurities it yields the pure potassium hydrogen tartrate familiar to all as the domestic cream of tartar.

In addition to its employment in the kitchen, it has many industrial uses, and is the raw material for the manufacture of tartaric acid.

## CREAM OF TARTAR

For the home chemist it is a cheap starting point for interesting experiments, and for the preparation of other tartrates for the laboratory stock. By heating it alone we get pure potassium carbonate.

Half fill a large crucible with cream of tartar, and heat it. It blackens owing to carbon formation, and evolves an odour of burnt sugar. When the whole is at a dull red heat let the mass cool. You now have a mixture of insoluble carbon, and very soluble potassium carbonate. Therefore the two may be separated by stirring with water, and filtering.

Use enough water to disintegrate the mass into a limpid liquid containing freely floating carbon particles. Run one lot of water through the carbon residue on the filter, and evaporate the combined filtrate to dryness. White potassium carbonate remains in the evaporating basin. Bottle it while it is still warm, for as well as being very soluble in water, it is also highly deliquescent. Use a screw-top bottle to store it, and cut a disc of sheet rubber to fit inside the screw top. This will give a hermetic seal, and prevent moist air entering and converting the carbonate into a wet mass.

If you shake some cream of tartar with water in a test tube, you will find that most of it remains undissolved. It is, therefore, only sparingly soluble in cold water. On heating, it easily passes into solution.

It may be converted into readily soluble normal potassium tartrate by treatment with some of the potassium carbonate already prepared. Dissolve about half of the potassium carbonate in water. Note that on bringing a drop of the solution in contact with a slip of red litmus paper the latter turns blue, thus indicating an alkaline reaction. Cream

of tartar has an acid reaction, and potassium tartrate a neutral reaction. Therefore, by adding enough cream of tartar a neutral solution of potassium tartrate will be obtained.

It helps to heat the potassium carbonate solution. Add the cream of tartar in very small quantities, and test with red litmus paper after each addition. When the litmus paper turns not blue but purple, the solution is neutral, and the reaction complete.

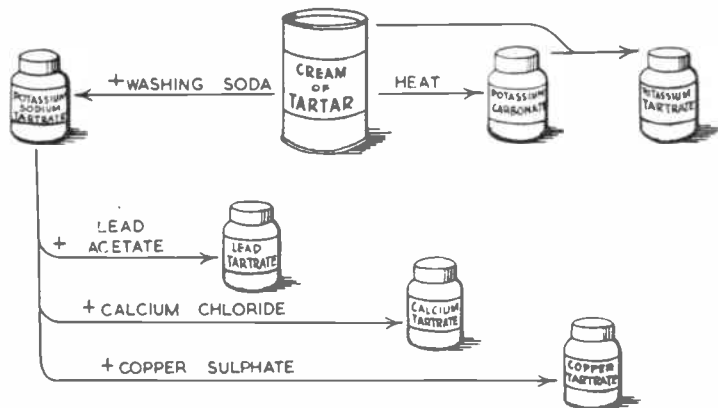
Evaporate the solution to low bulk over wire gauze, stirring constantly, and then allow it to cool overnight. Tiny prisms separate, but as much of the tartrate is still in solution owing to its high solubility the maximum yield is obtained by evaporating to dryness on the water bath. Evaporation over wire gauze should not be adopted, or the salt will decompose and char. Despite its high solubility the normal potassium tartrate so obtained is not deliquescent, and so may be kept in a bottle without the rubber disc used for potassium

tartrate in quantity. In place of potassium carbonate use a solution of sodium carbonate (easily accessible as washing soda). Neutralize this by gradual addition of cream of tartar.

When the solution of potassium sodium tartrate so obtained has cooled, it may be kept, temporarily, as a stock solution for preparing the insoluble tartrates. It is instructive to add a few drops to small portions of solutions of various metallic salts contained in separate test tubes. The appearance of a precipitate indicates that the tartrate is insoluble. For future reference a list may then be made of the soluble and insoluble tartrates. Notable among the insoluble ones are those of lead, calcium and, copper.

Lead tartrate may be prepared by adding potassium sodium tartrate solution little by little to a solution of lead acetate until, on filtering a little of the mixture, the filtrate no longer gives a precipitate on further addition of potassium sodium tartrate solution. The precipitate of lead tartrate is heavy, white, and granular. Allow it to settle, pour off the upper liquid, add plenty of water, and stir up the precipitate, finally pouring off the wash water. Repeat this washing by decantation several times, filter off the precipitate, open out the filter paper on to a porous tile, and let the whole dry.

Calcium tartrate separates as white crystalline powder on adding potassium



Flow sheet for Cream of Tartar experiments

carbonate storage.

Some tartrates are insoluble in water, and so may be prepared by mixing solutions of salts of the respective metals with a solution of the potassium tartrate just prepared, when the insoluble tartrates are, of course, precipitated, and may be filtered off. If you wish to make substantial quantities of each, you will need more potassium tartrate than the potassium carbonate afforded. This may be solved by preparing potassium sodium

sodium tartrate solution to one of calcium chloride. This precipitate, too, settles readily, and so may be washed free of solutes by decantation. Dry it on a porous tile. This salt occurs naturally in senna. It is also used to prepare free tartaric acid from cream of tartar.

Make a hot solution of cream of tartar in water, and gradually add precipitated chalk (calcium carbonate). Carbon dioxide is given off, and a white crys-

● Continued on page 429

# The Mystery of Pepper's Ghost

LOOK out of the window of a brightly lit room on a dark evening and you will see a ghostly reflection of yourself mingling with the shadowy forms outside. Of course you have done this on many occasions and have never been frightened, or even surprised, by what you saw. Yet this familiar illusion was the origin of some of the most mysterious stage effects exhibited during the

ghost was stabbed right through many times by the sword, before the brave warrior, unable to destroy the apparition, fled in panic and the curtain fell.

Fig. 1 illustrates one of the arrangements by which Pepper's Ghost was made possible. A is an actor on a sub-stage, dressed as a ghost and illuminated by a bright lantern. B is a mirror supported at 45 degrees, and C is a sheet of

glass, also placed at 45 degrees, reaching right across the stage. D is the apparent position of the ghost as witnessed by the audience. It was necessary for the actors on the dimly lit stage to rehearse their movements very carefully so as to accord with the very precise actions of the 'ghost' on the sub-stage.

You may imitate Pepper's Ghost with an easily-made optical toy. Mark out the pattern shown in Fig. 2 upon fairly stout cardboard and score along the dotted lines, using a ruler and penknife. Paint both sides of the cardboard jet black and glue a photograph or drawing of a castle or ancient room upon section X. Cut out the  $\frac{1}{2}$  in. diameter hole in section Z, using a cork borer if one is available, and glue a little white cut-out figure of a ghost or skeleton in the position shown in section Y.

Fold around the shape and assemble the box by gluing the tabs where necessary. Glue a cork on to the bottom of the box to serve as a handle. Obtain a piece of thin glass or celluloid to fit neatly inside the box (Fig. 2).

In order to use the toy, hold the box so that light can enter through the sides, then whilst looking through the hole at the picture, use one hand to lift up the front edge of the glass until it rises above the level of the eye hole. You will see a transparent phantom reflected upon the glass and poised against the background. You can make the figure dance if you wag the glass very slightly up and down.

With a little ingenuity you will be able to invent original effects based upon this elementary principle.

(A.E.W.)

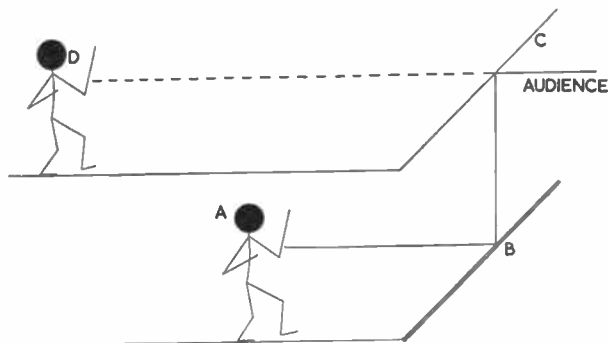


Fig. 1

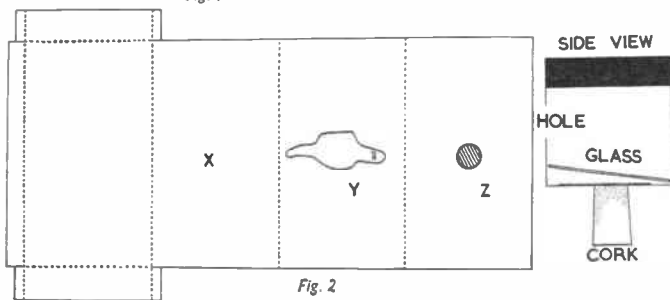


Fig. 2

nineteenth century. An undoubtedly terrifying demonstration was the burning of a live 'witch' at a stake placed upon the stage. This effect was achieved by means of a huge sheet of plate glass which traversed the platform at an angle of 45 degrees with the auditorium. A fire was ignited in a huge bowl, which was concealed by the theatre wings, and the stake, with its pile of faggots and tethered victim, was placed in such a position behind the pane of glass that, to the audience, it appeared that the horrible drama was actually taking place.

The most famous of these macabre entertainments was named after its well known exhibitor, John Henry Pepper. The effect was that a shining spectre appeared upon the stage, to the accompaniment of wild music and ghostly groans, and this was then attacked by an intrepid swordsman. In the eyes of the astounded audience, the screaming

● Continued from page 428

## Cream of Tartar Experiments

talline precipitate of calcium tartrate is formed. When the solution is neutral to litmus, that is, a drop no longer turns blue litmus paper red, filter off the calcium tartrate. The filtrate consists of a solution of normal potassium tartrate. Add calcium chloride solution to it. More calcium tartrate is precipitated. When further addition of calcium chloride ceases to yield a precipitate, the calcium tartrate is filtered off, and combined with the first lot. Industrially, the calculated quantity of dilute sulphuric acid is now heated with the calcium tartrate. Insoluble calcium sulphate and soluble tartaric acid are thereby formed. By filtering off the calcium sulphate tartaric acid is obtained by evaporating the filtrate.

Copper tartrate, as will have been seen in the preliminary tests, has a beautiful light greenish-blue colour. A specimen may be prepared by addition of potassium sodium tartrate solution to copper sulphate solution until a little of the filtered mixture gives no more precipitate with potassium sodium tartrate solution.

Filter off the precipitate of copper tartrate, wash it well with water until a little of one wash water is shown to be free of dissolved potassium and sodium sulphates also formed in the reaction. This may be ascertained by testing the wash water with strontium nitrate solution, when the white precipitate obtained with the earlier wash waters no longer appears. Dry salt on a porous tile.

# TO CURE DAMP WALLS

**T**HE dampness found in many houses is often attributed to rain penetrating through the walls, particularly if they happen to be facing an exposed position.

At one time there was no effective cure for this form of dampness and many people had to keep spending a lot of money continually redecorating their rooms only to find that the dampness soon ruined them again. Nowadays, however, the job can be successfully tackled with the aid of Silicone waterproofers. These are sold under a variety of trade names and consist mainly of Silicone resins which are dissolved in some suitable solvent.

Once a surface has been treated with one of these solutions the solvent evaporates, leaving the Silicones firmly embedded in the material to ward off any moisture falling on it. If water is applied to a treated surface it immediately breaks up into small droplets similar to the effect you would get if water was poured on to a greasy or waxed surface.

## Cover the whole surface

Silicone waterproofers are only effective in preventing the penetration of moisture which would otherwise travel through the pores of the walling material. They will not cure dampness resulting from structural defects like cracks, defective pointing, broken tiles, damaged damp-proof course, etc. They are also unsuitable for use as damp-proof courses, waterproofing the walls of basements or cellars and any other place where moisture is likely to enter the building under pressure.

If you should decide to treat a damp wall with a Silicone waterproofer, then it is necessary to cover the whole surface of the wall. It is no use treating isolated parts, because dampness would still get through the wall by by-passing these areas.

Silicone waterproofers are sold in tins ready for immediate use. The wall surface should be thoroughly brushed down to remove all dust and loose particles. If the pointing is found to be defective then this should be made good with a new filler of cement and sand mixed in the ratio of 1:3. The best time to carry out the waterproofing of walls is after a dry spell of weather in order to ensure a good degree of absorption. Don't tackle this job when the walls are soaking wet.

The solution may be applied with either a brush or spray. If a brush is used then it should be the largest one you can

possibly get hold of so that it will flood the solution over the surface. Spraying is, of course, the most satisfactory and economical method. It is essential, however, to use the minimum amount of pressure so that the liquid is ejected in a slow even stream. High pressure tends to atomise the application and cause excessive over-spray.

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*By K. Finlay*

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The majority of Silicone waterproofers are inflammable, so care should be taken not to expose them to naked flames. Many manufacturers also advise the use of a mask when applying the solutions to avoid inhaling the solvent vapours, which are often toxic.

When treating a porous material it is sometimes rather difficult to tell whether or not you have covered a certain part. This is because the solution has been absorbed so quickly. To avoid the possibility of parts being missed, waterproofers can be obtained containing fugitive dyestuffs which give a faint colour and render a treated area more noticeable. This tinting enables progress to be followed, and after a short while the colour vanishes, leaving a normal stain-free surface.

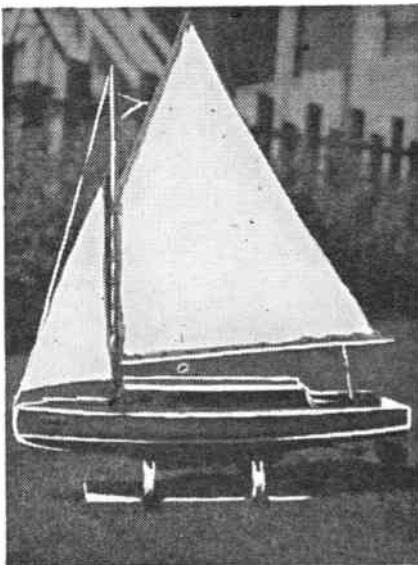
Generally speaking, only one application is necessary for waterproofing a wall surface. If, however, the material

is extremely porous and a second coat is found desirable then apply this after the first coat is thoroughly dry. Precautions should be taken to prevent the solutions splashing on to painted woodwork or nearby plants.

The amount of waterproofer required for each job will depend on the porosity of the walling material. As a guide, however, it is generally accepted that a gallon of solution will cover approximately 15-25 square yards. The waterproofers can be applied to a number of different materials such as brick, stone, cement-rendered walls, roof tiles, etc. The duration of each treatment depends mainly on a host of circumstances but usually under normal conditions many manufacturers claim that an effective 'life' of six years upwards can be expected.

Don't imagine that these waterproofers clog up the pores of the walling material so that they cannot 'breathe'. If this was the case then excessive condensation within the building would result. On the contrary the treatment allows the normal passage of air and water-vapour through the walls as before.

These silicone waterproofers are rather expensive to produce. However, when one considers the advantages that can be obtained from a single application over a period of several years, it must be admitted that the initial cost is money well spent.



## A Canadian success with model of the 'Japonica'

**W**HILE on a visit to England in 1958, Mr H. F. Harford, 2985 Newmarket Drive, North Vancouver, Canada, purchased a kit for making Hobbies 'Japonica', a 20 in. sailing cruiser with auxiliary motor, from our London branch at 78a New Oxford Street. Pictured here, the completed model was awarded second prize in the boat division at the Pacific National Exhibition.

The complete kit, No. 3254, contains all materials for making, including electric motor, metal keel, sailcloth, etc. Overseas readers should note that all Hobbies kits, etc, can be obtained by post from Hobbies Ltd, Dereham, Norfolk.



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# Mnemonics and a Memory Act

**A** MNEMONIC is, quite simply, a memory device in words, and may be merely a helpful phrase, or an elaborate jingle cleverly composed to assist the committing to memory of a long series of related facts. The familiar rhyme about the number of days in each month is a good example of a mnemonic, and the young student of Science is always glad to remember the nonsense phrase: 'Richard of York gained battles in vain', as a reminder of the correct order of the seven rainbow colours, which is — red, orange, yellow, green, blue, indigo and violet, whose first letters correspond with the first letters of the words in the sentence.

*By A. E. Ward*

That mnemonics are frequently nonsensical in themselves is usually an advantage, owing to the peculiar psychological principle that we tend to remember things which seem funny or incongruous much more easily than more solemn truths. For example, if you are not adept at remembering the people you have met in the past, you would not be likely to forget a Mr White, if his features had appeared unusually pale. Similarly, you would never forget the name of a particular street if, when you first visited it, you had seen an old man wearing a dunce's cap, and skipping in the middle of the road. Bearing this important principle in mind, you will be capable of performing a startling type of entertainment, which will gain for you a reputation for possessing a truly mammoth memory.

## Backwards, too

The effect upon an audience is as follows. An assistant writes the numbers one to twenty upon a blackboard, and you request that members of the audience shall call out the names of objects, to be written opposite the numbers. You then permit yourself to be blindfolded and declare that you will give the word against any number called by the audience. This you are able to do without failure, and in conclusion you can recite the whole list backwards — an achievement which is invariably greeted with amazement and tumultuous applause. This is an effect which many professional 'mind readers' and 'mystics' have performed with success on stage and television.

You will be required to learn by heart

a list of twenty key words and phrases, each in association with the numbers given below:

- |           |                                   |
|-----------|-----------------------------------|
| 1. gun    | 13. unlucky                       |
| 2. glue   | 14. shoe (size fourteen)          |
| 3. tree   | 15. banana (bunch of fifteen)     |
| 4. door   |                                   |
| 5. hive   | 16. sweet sixteen                 |
| 6. stick  | 17. queen                         |
| 7. Heaven | 18. call-up (age of conscription) |
| 8. gate   |                                   |
| 9. mine   | 19. dine                          |
| 10. hen   | 20. score                         |
| 11. team  |                                   |
| 12. elf   |                                   |

It will be noticed that mnemonic principles have been applied in order to make the list easy to commit to memory, and difficult to forget. Take the little trouble needed to learn the list so thoroughly that its recall becomes second nature to you.

Now, test your ability to remember a list of twenty objects by applying the principle of humorous association already referred to. Write down a list of twenty objects, or have a friend compile a list for you. Let the first object be a Flying Saucer. Build up a picture in your mind of a marksman trying to shoot down a Flying Saucer by means of a shotgun. Let the second object be a submarine. In your own mind, form an image of a submarine submerging in an enormous pot of glue. As soon as you have made the necessary impression in your mind, do not dwell upon it consciously, but concentrate upon making a mnemonic for the next object named. If, for example, a hubble-bubble pipe is called for number eleven, you may imagine a team of soccer players, taking a rest on the field, all busily smoking in this unusual manner. If number sixteen is a letter, you can think of a lass of 'sweet sixteen' receiving her first love letter. Proceed in this way until all the twenty objects have been 'remembered'. Afterwards, you will have no difficulty in recalling any word you please, and it will be an easy matter to recite the list backwards. You will amaze yourself. Furthermore, you will be able to repeat the performance with a new list, without any confusion arising in your mind.

You must practise this procedure well before attempting to entertain an audience, as the effect is so wonderful that you should not risk spoiling it, owing to insufficient rehearsal. Once you

are familiar with the actual technique, you will be well advised to give thought to the presentation of your entertainment. Do not introduce yourself as a conjurer, or claim to possess 'magic powers', but rather offer the effect as a demonstration of 'mnemonic association'. Do not dwell upon the possible meaning of this phrase, but talk briefly about famous memory feats and 'photographic memory'. Such talk will sound genuine, and will, indeed, have more than the mere ring of truth.

## Presenting the Act

The feat may be performed before a family group or may be adapted for a dramatic stage act at a concert. Here is a suggested arrangement for two persons. You, the performer, talk briefly about mental powers and memory in particular, and then you introduce an assistant, who may be a young lady. Your assistant is blindfolded by a volunteer, and seated upon a chair down stage, facing the audience. Twenty names of objects are called out by the audience, and written upon a large blackboard by you. When this has been done you request that everybody be silent, as your assistant must concentrate very deeply. Members of the audience raise their hands, and call out the various numbers, when pointed to by you. Your assistant names the objects called for, and concludes by reciting the full list in reverse.

An important point that you must remember is to make certain that your blindfolded assistant has heard the names of the objects called for each number. This can be ensured if you repeat aloud the word and number as you write each word upon the blackboard.

Advanced performers of this effect request a single adjective in addition to the object called, but this should on no account be attempted until the simple version has been thoroughly mastered. At some public performances it may be preferable to have a list of objects already composed by some well-known responsible person, and entrusted to an important guest or member of the audience. This alternative will speed up the act where time is limited. The list can be placed in an envelope, which should be as large and imposing as possible, and sealed grandly with sealing wax, so as to enhance its appearance and interest to the audience. At the proper time the list may be read aloud by an assistant, and the words written clearly upon the blackboard.

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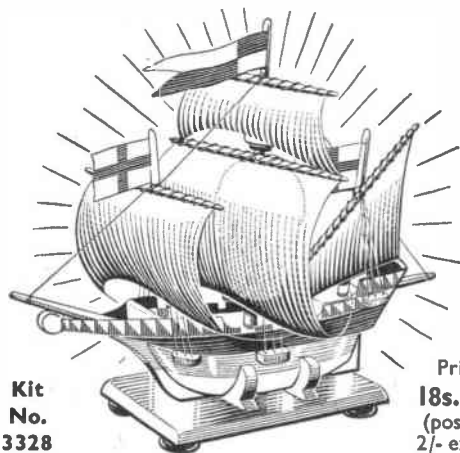
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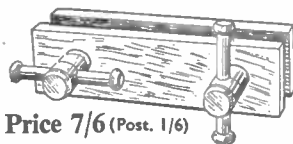
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**WOOD BENCH VICE**

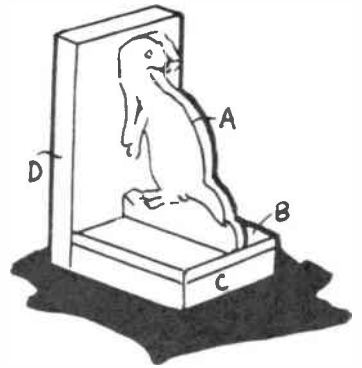
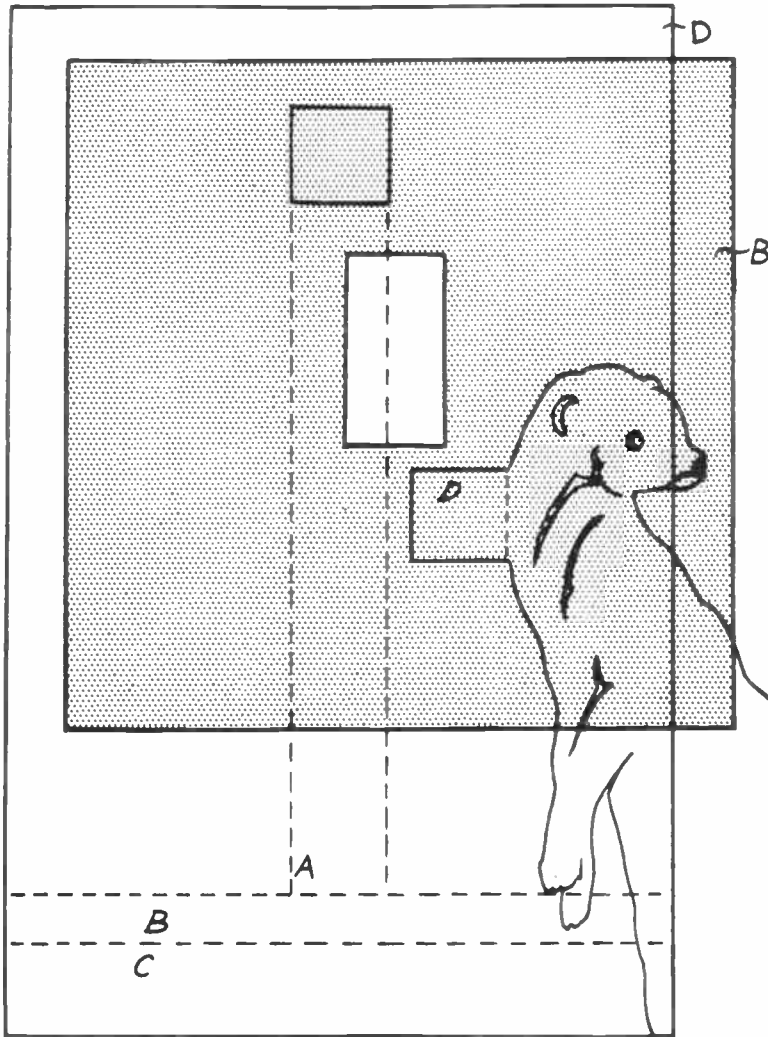


A strong hardwood vice which can be screwed to the work bench. A real serviceable tool, well made, and fitted with hardwood screws. 12 ins. long.

From branches or:  
**HOBBIES LTD.,  
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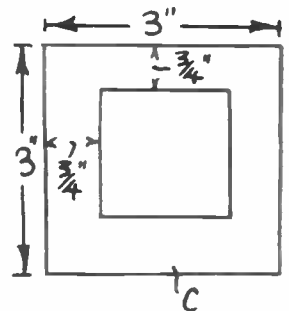
Price 7/6 (Post. 1/6)

# THE OTTER BOOKENDS

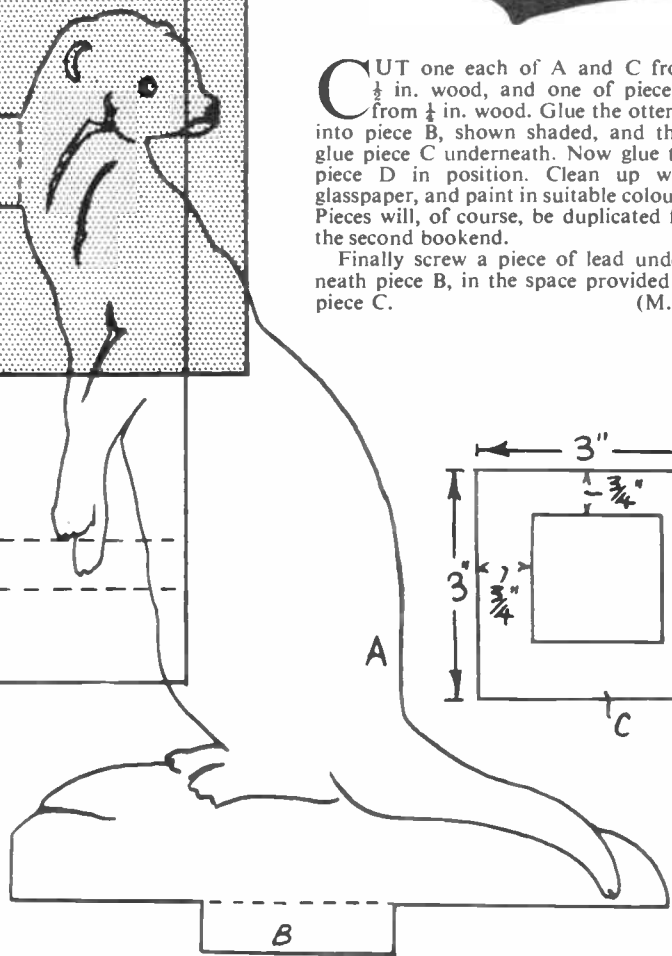


**C**UT one each of A and C from  $\frac{1}{2}$  in. wood, and one of piece B from  $\frac{1}{4}$  in. wood. Glue the otter A into piece B, shown shaded, and then glue piece C underneath. Now glue the piece D in position. Clean up with glasspaper, and paint in suitable colours. Pieces will, of course, be duplicated for the second bookend.

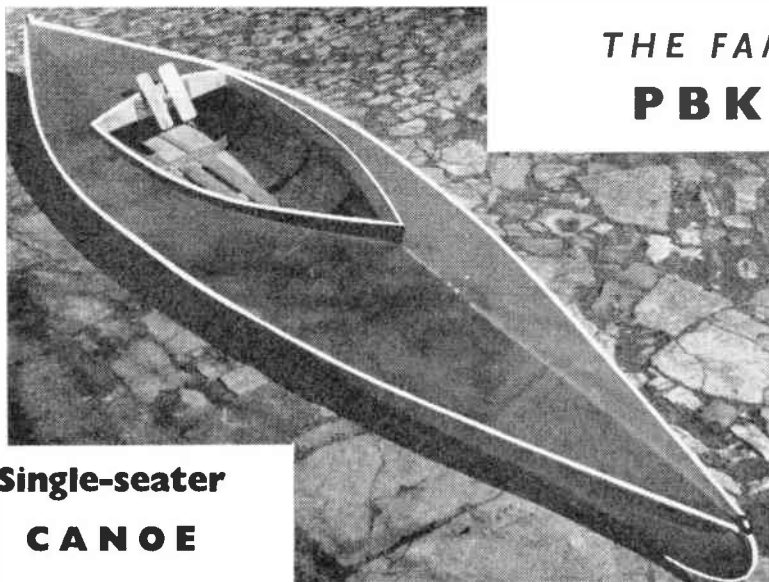
Finally screw a piece of lead underneath piece B, in the space provided in piece C. (M.p.)



## A JOB FOR THE FRETSAW



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Show at  
Ideal  
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Olympia,  
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459**



**THE FAMOUS  
PBK 10**

**Single-seater  
CANOE**

**NOW AVAILABLE READY-BUILT OR  
MAKE IT YOURSELF FROM A KIT**

**1** We are pleased to announce that 'Midge', the famous PBK 10 single-seater canoe designed by P. W. Blandford, is available from Hobbies Ltd. as a complete craft ready for the water.

**2** For the do-it-yourself enthusiast there is offered the complete kit of materials, plans and instructions for building 'Midge'. Only first-class and dependable materials included in these kits

Send for price details and specifications of the completed canoe, and kit of materials

**3** Alternatively, Hobbies Ltd. can supply full-size plans complete with instructions for building PBK 10 and accessories from your own materials.

**PRICE 11/-** (post 9d. extra)

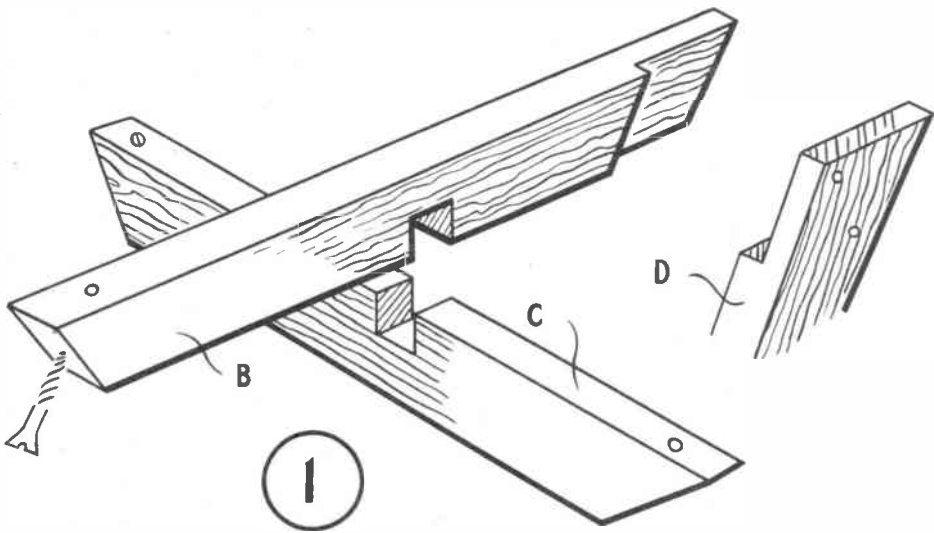
PBK 10 is of rigid construction with canvas skin. It is designed to carry a maximum load of 300 lb. and has an overall length of 11 ft. As a single-seater there is also room for plenty of kit. Propelled by a double-bladed paddle, it will float in 4 in. of water, and is thoroughly at home on lake, river, or canal—or even on the sea, in experienced hands.

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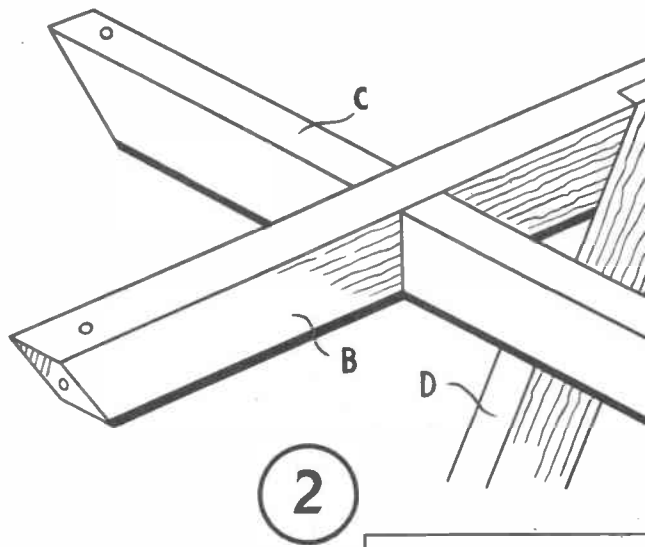
*Complete canoes, kits, and plans available from all branches or from*

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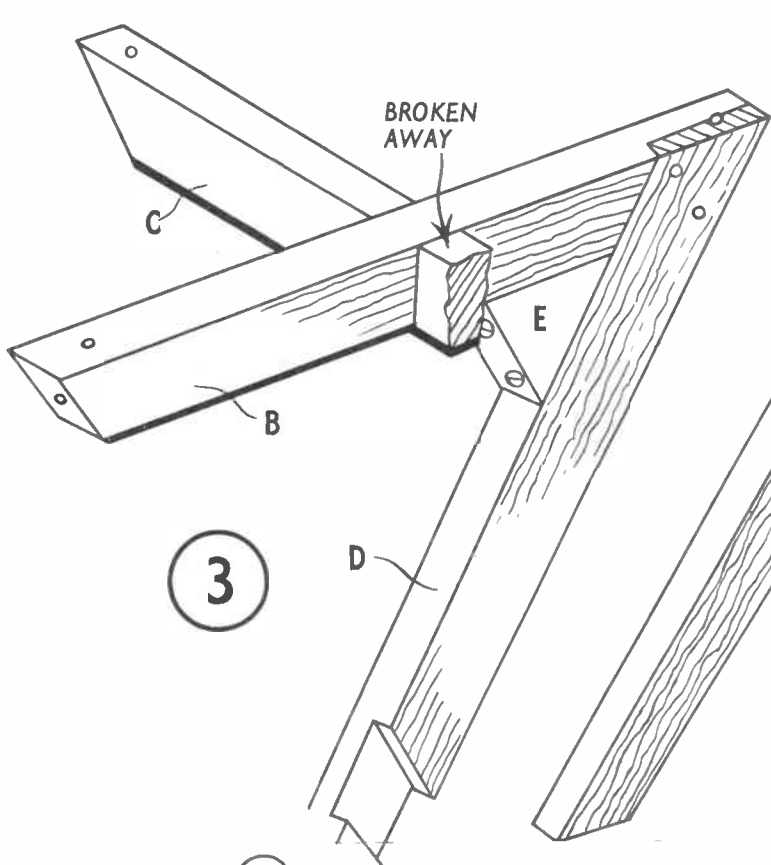


1

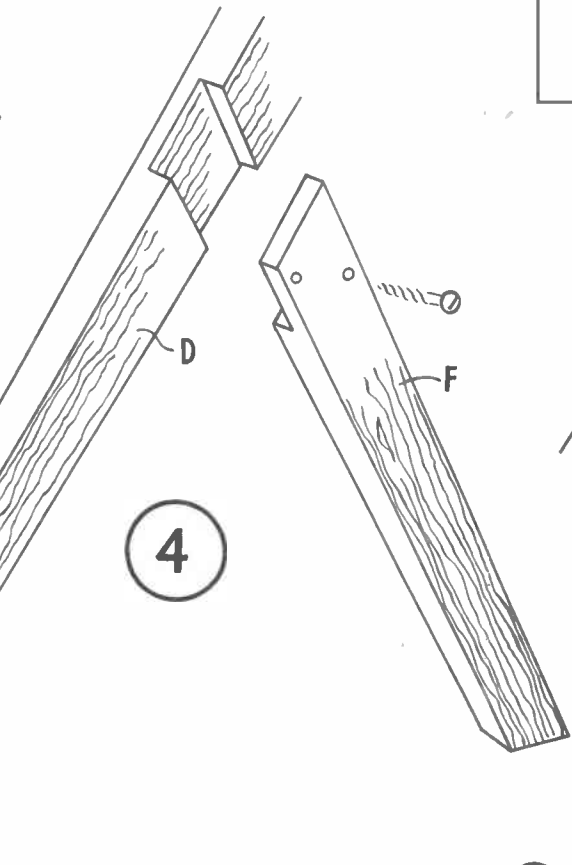


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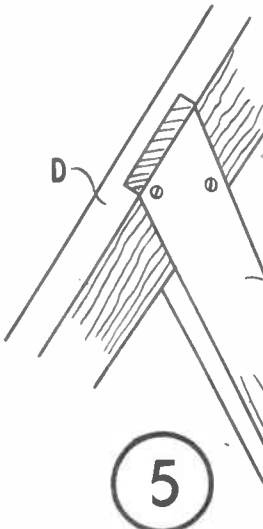
A KIT OF MATERIALS  
DESIGN IS SU  
HOBBIES LIMITED, DE  
PRICE ON APP



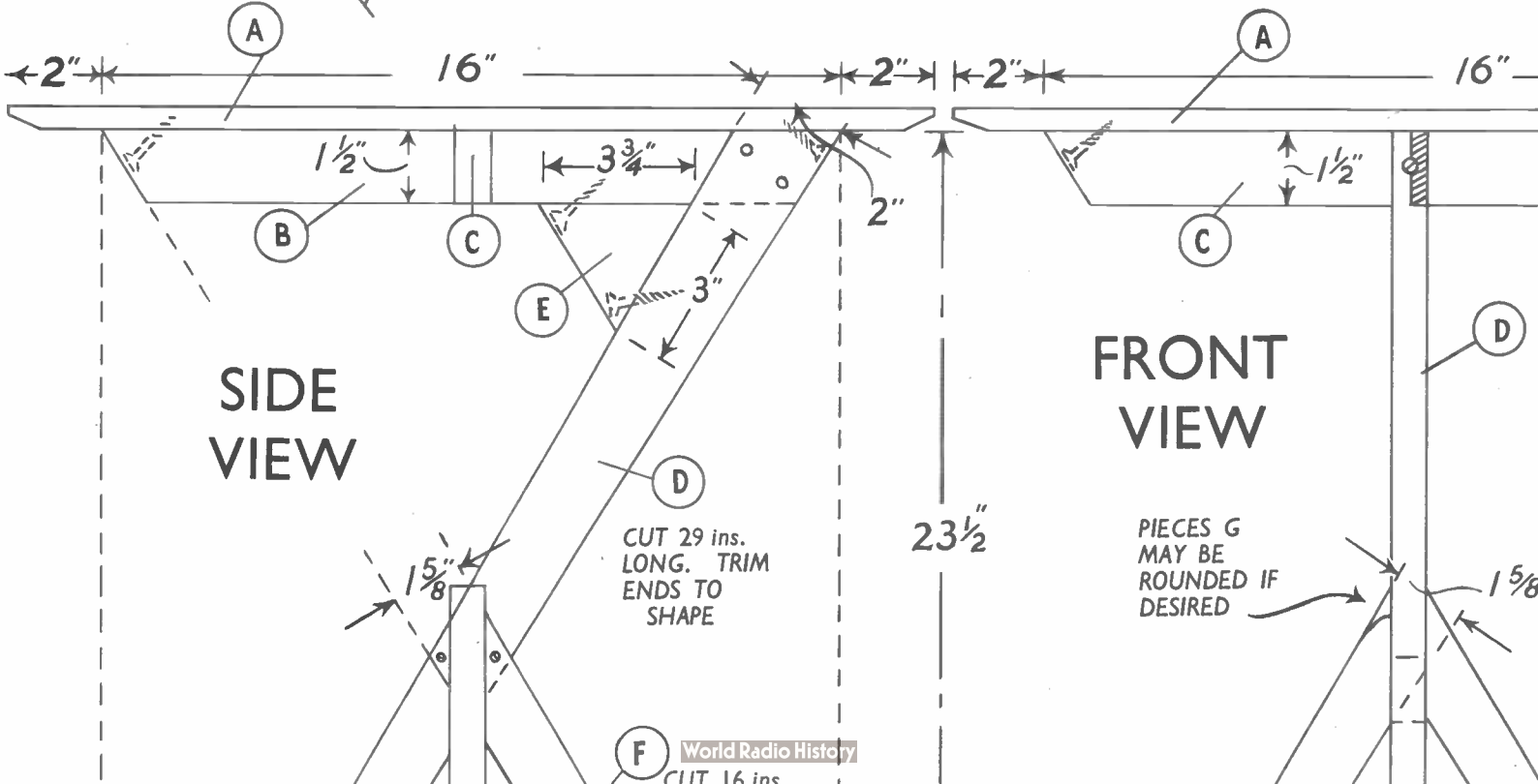
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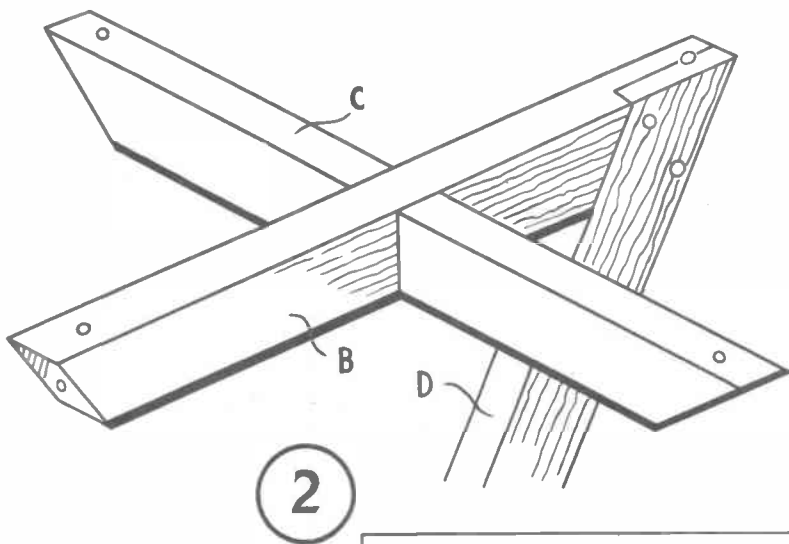




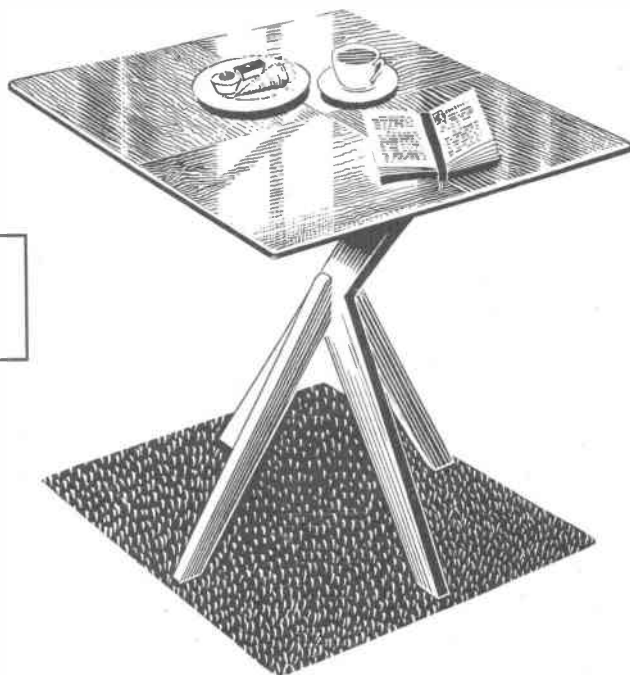
DESIGN

No. 3354

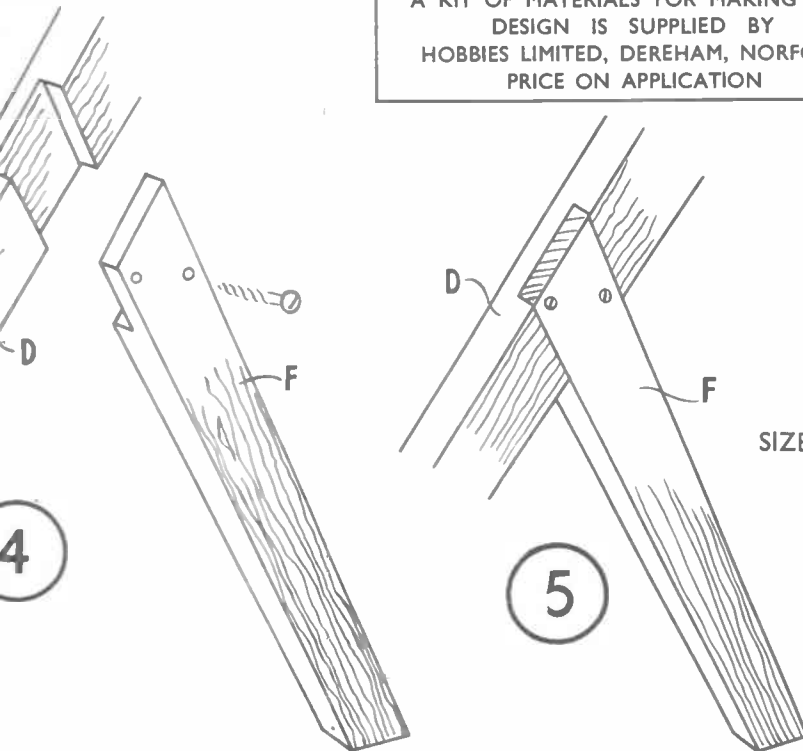
# OCCASIONAL TABLE




A KIT OF MATERIALS FOR MAKING THIS DESIGN IS SUPPLIED BY HOBBIES LIMITED, DEREHAM, NORFOLK. PRICE ON APPLICATION



SIZE 20 ins. SQUARE  
24 ins. HIGH



Use **CASCAMITE** 'One Shot' Resin Glue for all Wood Gluing

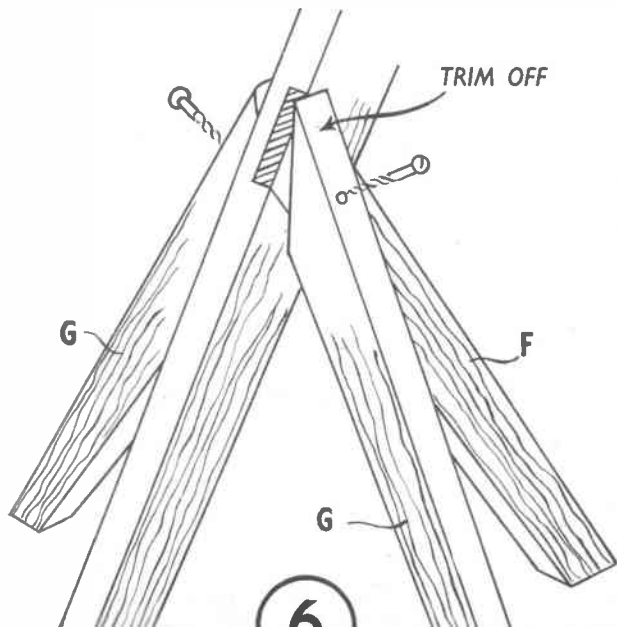
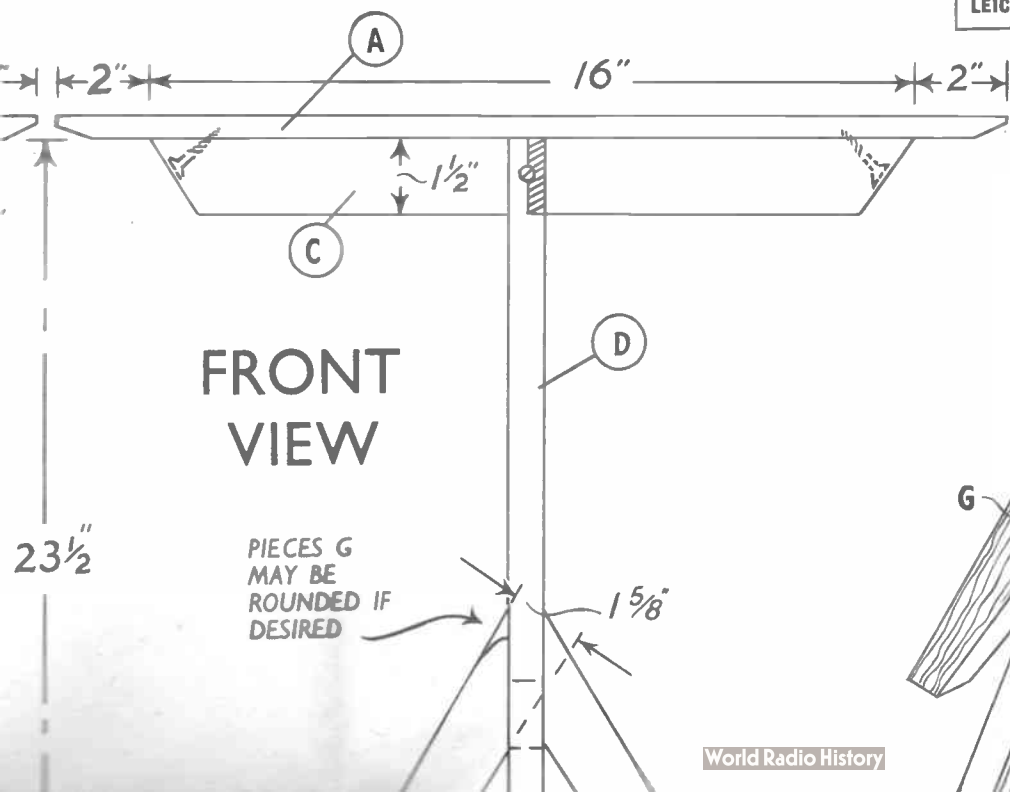


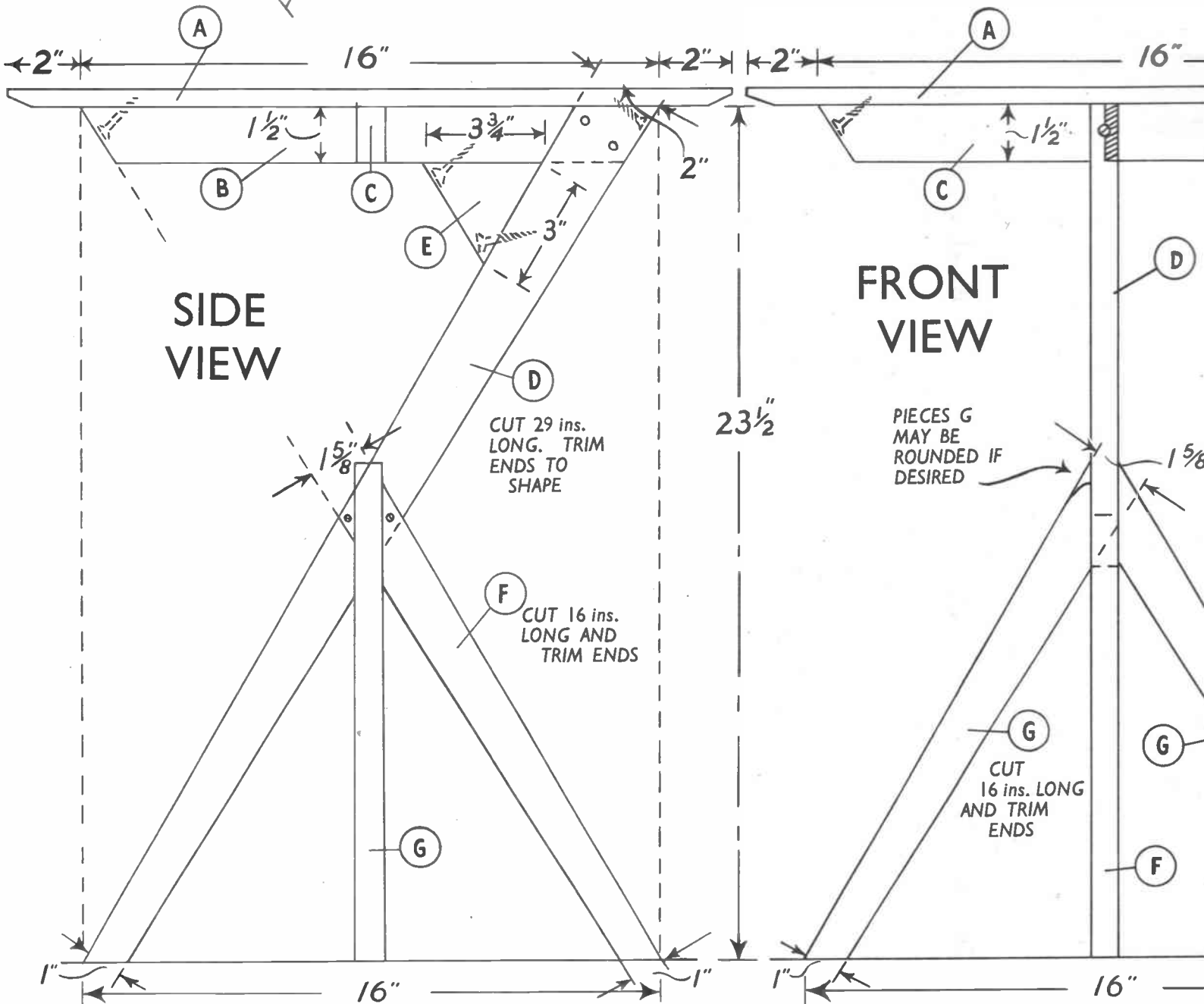
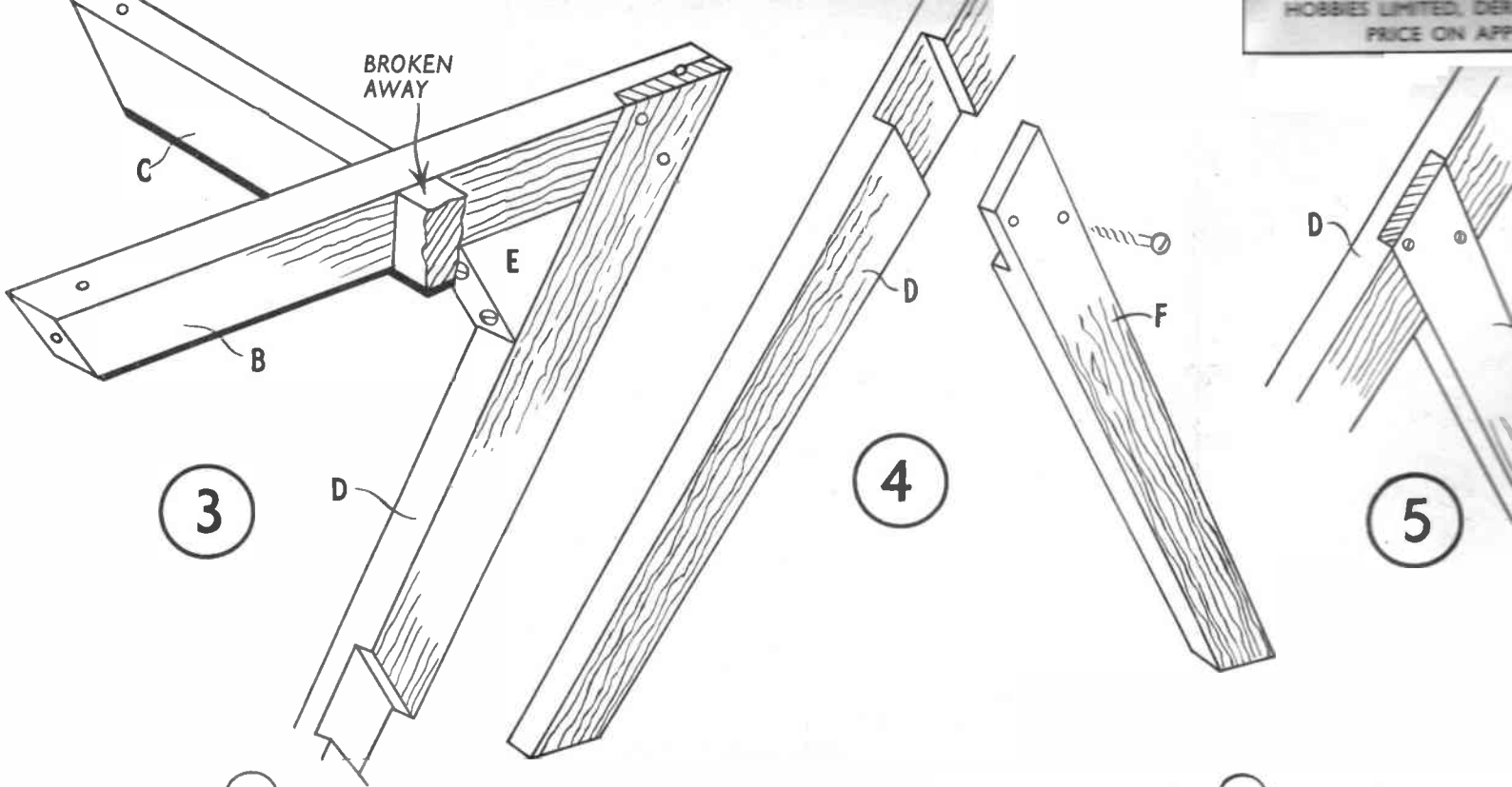
● Mixed & use cold ● Waterproof type  
● Gap-filling and non-staining

Obtainable in: 3½-oz.; 7-oz. and 18-oz. tins.

Stocked by: Ironmongers, Builders' Merchants, etc.

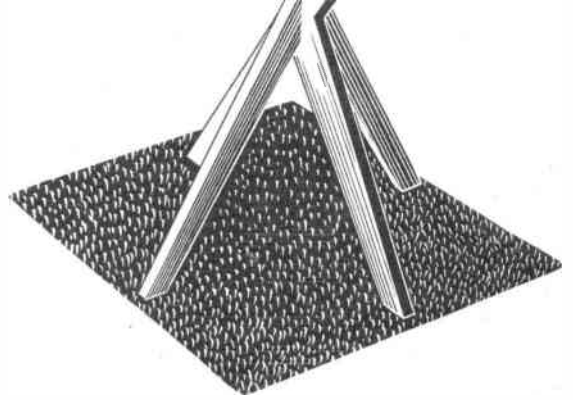
Manufactured by:  
**LEICESTER, LOVELL & CO. LTD.** North Baddesley, Southampton



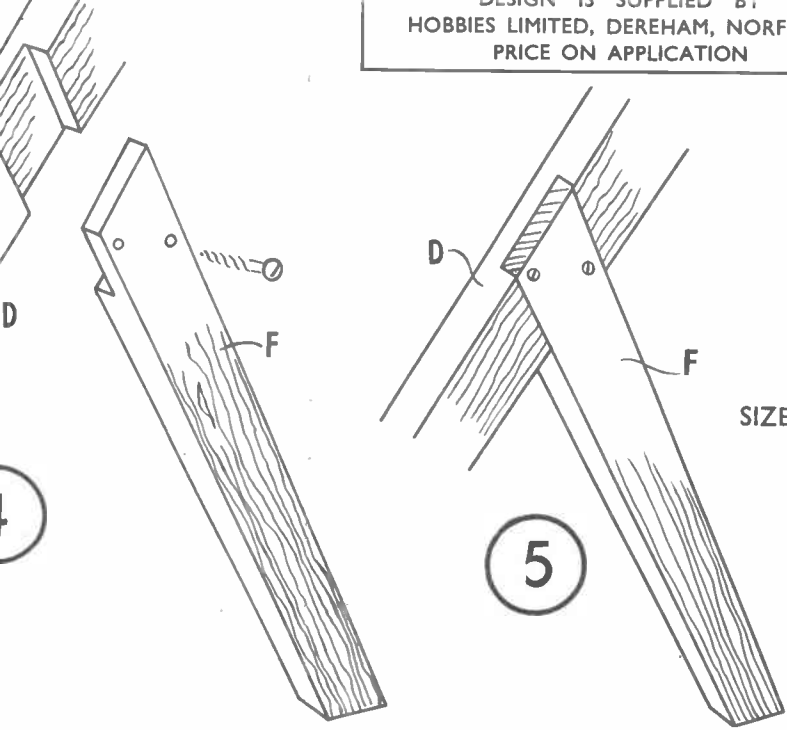




DESIGN IS SUPPLIED BY  
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PRICE ON APPLICATION




SIZE 20 ins. SQUARE  
24 ins. HIGH



5

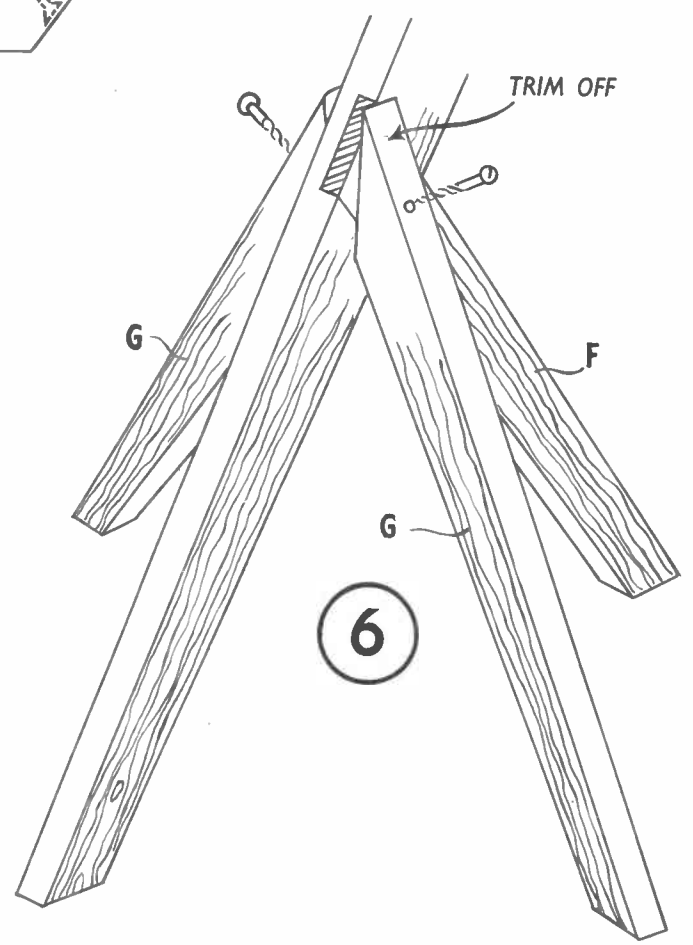
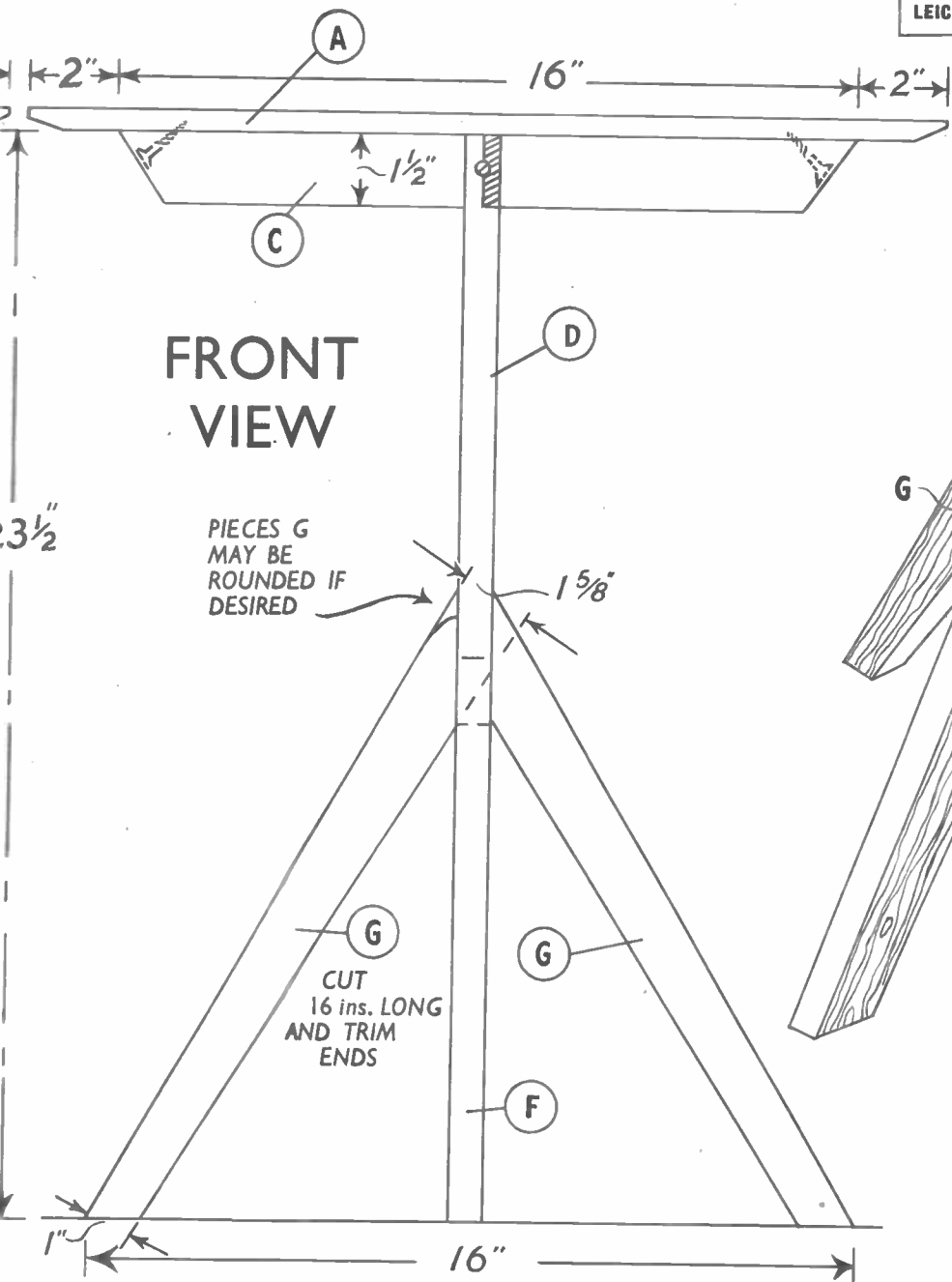
Use **CASCAMITE**  
**'One Shot'**  
**Resin Glue**  
for all Wood Gluing



Obtainable in:  
3 1/2-oz.; 7-oz.  
and 18-oz. tins.

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