

HOBBIES WEEKLY

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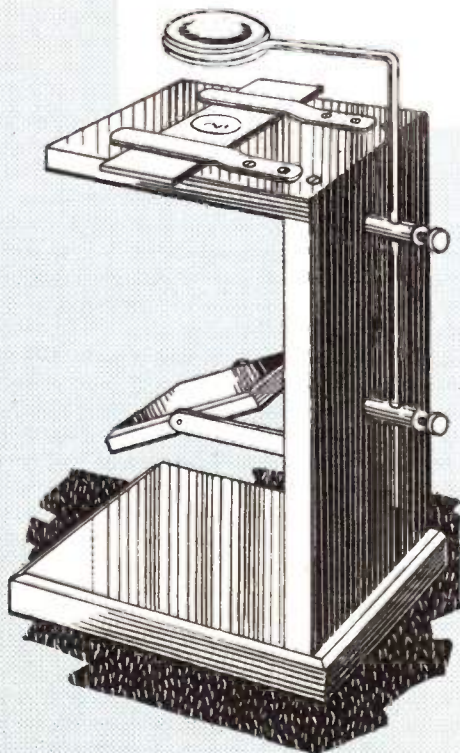
NUMBER 3269

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MAKE THIS MICROSCOPE

MOST of us have at some time or other had a desire to possess a microscope however elementary it may be, but the very high cost of a professionally made instrument has in most cases prevented this.

Besides being a most fascinating and instructive hobby, a study of microscopy may help to solve some of the problems of science still awaiting a solution. There is always much research work to be done by the amateur with the simplest apparatus as well as by the expert with his complicated and expensive equipment.

It is not necessary to possess a powerful instrument in order to do useful work and the owner of the simplest form of microscope can compete with the giants of the microscopical world with their precision-made instruments.

Many of the wonders of the universe are seen in new light and there is something to delight the microscopist every day throughout the year. Therefore why not start off by making this very

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FOR ALL HOME CRAFTSMEN
Over 60 years of 'Do-it-Yourself'

4^{1D}/₂

simple little instrument? The cost can be kept very low and it is quite possible that all the necessary parts may be found in the junk box. Even if you have to buy everything, including the lenses, a few shillings should be ample.

A good substantial stand is necessary for any type of microscope so that there is no vibration to upset the observations. Only three pieces of wood are used for the stand, and to make it steady choose a good solid hardwood. Mahogany is generally used for scientific instruments, but so long as it is fairly heavy the particular kind is not important.

The base is 4ins. long, 3ins. wide and $\frac{1}{2}$ in. thick, and the top edge can be bevelled off as shown. On to this fix the upright piece 4ins. long, 2ins. wide and with a thickness of $\frac{1}{2}$ in. Both this and the top section are glued and then firmly screwed in position with two countersunk screws to each.

A thinner piece of wood is sufficient for the top or 'stage' and this is 3ins. long, 2ins. wide and $\frac{1}{2}$ in. thick. Before fixing it in position drill a $\frac{1}{2}$ in. hole $1\frac{1}{2}$ in. from the front edge to enable the light which is reflected from the mirror to pass through to the slide under observation.

Get the best lens

The most important part of the microscope is the lens and it pays to get the best you can afford. You may of course have something suitable but if not you should not have much difficulty in getting one or more quite reasonably. A local optician will probably have an assortment to offer, or, better still, second-hand shops frequently have odd pieces of optical instruments. The eyepiece of an old telescope or ex-army rangefinder all offer possibilities for experimenting and should not cost much.

If possible use a lens that is in a mount, but if not this can be easily arranged. In order to hold the lens this is fixed to a stout wire which slides up and down in two telephone terminals for focusing purposes. If these are placed about 2ins. apart and fairly near the top of the upright, as shown, the wire will have a good adjustment range and also be rigid enough for general purposes.

When the lens is fixed in a mount it can be held in a ring made on the end of the carrier wire, which is bent so that the other end slides in the two terminals. For a plain lens a simple little mount can be made quite easily. Choose a tin lid into which the lens will just fit, and cut a hole in the bottom leaving a rim wide enough to keep the lens from falling through. A wire ring can be sprung in to hold it secure. Solder a carrier wire on to the lid and bend in the same way as for the mounted lens.

Perhaps you have two or three lenses of different powers and would like to use them. They can all be mounted on one wire so that the powers can be changed quickly. Cut a piece of sheet brass or tinplate in the shape of an arc shown at (A), cut out the holes for the lens mounts and solder a wire in the other end.

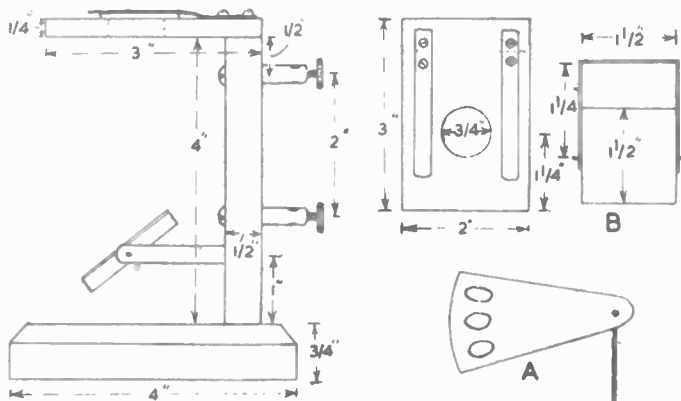
For viewing transparent objects it is necessary to direct a strong light on to the object. This is made possible by means of the mirror which is fixed in a gimbal mount under the stage. By adjusting the position of this mirror strong daylight or the light from a lamp of some kind is reflected up towards the

the two arms in slightly so as to grip the mirror block sufficiently to keep it rigid. Two fine pins will keep it in position and enable it to swivel backwards and forwards as required.

Two spring clips will be needed on the top stage to hold the slides in position for viewing. These are cut from springy brass sheet $1\frac{1}{2}$ ins. long and $\frac{1}{2}$ in. wide, and are screwed with round-headed screws.

The object to be examined is placed on a glass slide, set under the clips of the stage and centred so as to be in the field of view. Direct the light via the mirror on to the object and focus up by raising or lowering the lens wire.

There is not room in this article to go



object which is thus well illuminated and observation can be carried on with ease.

The mirror is simply a $1\frac{1}{2}$ in. square of thin silvered glass stuck on to a similar sized piece of wood. This is mounted between the arms of the gimbal and can be swung in any direction to send a beam of light where wanted. Make the gimbal from a strip of springy brass $4\frac{1}{2}$ ins. long and $\frac{1}{2}$ in. wide, and bent as shown at (B).

Drill two small holes $\frac{1}{2}$ in. from each end and another in the centre. Screw it to the upright from the centre hole so that it is friction tight, and then bend

into the vast field of slide making except for perhaps a few short notes. A handy size to make them is 3ins. by 1in. and old photographic negatives being thin and of good clear glass are ideal for the purpose.

Most objects are best enclosed so they can be kept and examined at will. Cover glasses can be obtained to do this, but you can put two slides together with a piece of card between them, cutting a $\frac{1}{2}$ in. circle in the centre to contain the object. Write any particulars on the card and then bind them all together with passe partout binding. (A.F.T.)

LETTER FROM NIGERIA

THE following letter has been received from H. J. Obayuuana, 2 Igusi Street, 'B' Ward, Benin City, Nigeria. Although we were unable to help, we thought the letter might interest readers.

'Dear Sir,

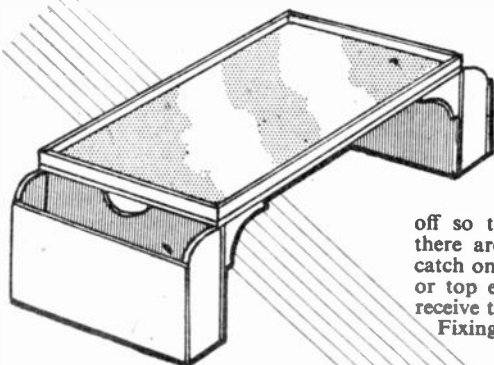
'I got your address here from *Hobbies 1958 Annual* very shortly, and I therefore decided with myself to acquire from you whether you can help me enough to look for people who are in need of old

Benin iron bronzes, sculpture, brass castings, all kinds of roosters, men's heads, plaques and carvings from me. If possible they can send photographs of all what they want amongst all these olden days carvings and bronzes.

'Sir, I will be very pleased if Master will be very kind enough to send me addresses of all kinds of museums that will be in need of all these things from me, any of these could be used to decorate houses.'

A USEFUL BED TRAY

Described
by
A. F. Taylor



off so that everything is smooth and there are no rough or sharp edges to catch on the bed clothes. The moulding or top edge of the tray could likewise receive the same treatment.

Fixing the legs on to the tray can be

THE many people who enjoy a cup of tea whilst reading the newspaper or a magazine in bed will appreciate this handy tray and paper rack. Unless the tray can stand firmly the risk of spilling the drink is fairly obvious but the two wide legs incorporated in our design will cut this risk to a minimum.

The size of the tray is ample and allows plenty of room for the necessary utensils, while the wide legs take the form of paper racks and will each hold quite a consignment of reading matter.

For the invalid convalescing in bed one side could be adapted to house knitting and other forms of light needlework, or writing paper and pencil, or even jigsaw puzzles.

The tray top is constructed of plywood and the sides of the legs in a thinner version of the same material. Cut the top from a piece of $\frac{1}{4}$ in. ply 20 $\frac{1}{2}$ ins. long and 12 ins. wide, and round this fix a moulding. It can be quite plain or with a little amount of ornament or it may be just a strip of ply, but a good thin hardwood would be better. The height need not be more than 1 $\frac{1}{2}$ ins.

The two legs are made separately and then fixed to the tray. The inside of each leg is 8 ins. high while the outside piece is 6 ins. which makes the handling of the papers easier. Both these pieces are $\frac{1}{4}$ in. ply and are 12 ins. long. Keeping them the correct distance apart are the bottom and two end spacing strips 2 $\frac{1}{2}$ ins. wide and about $\frac{1}{4}$ in. thick.

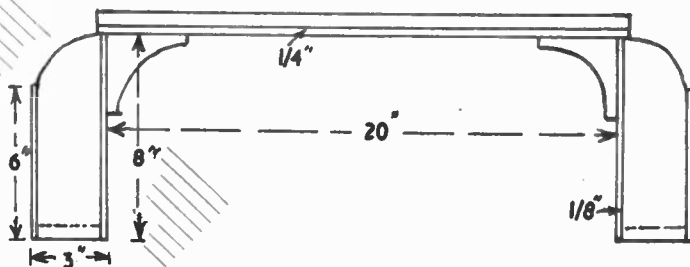
Before gluing and tacking these together cut out the semi-circular piece in the top of the 8 in. side so that the fingers can be placed under the tray when lifting it from place to place. A diameter of 4 ins. will be sufficient for this.

The top edge of the outside of the paper rack and also its two curved top ends could with advantage be rounded

accomplished in either of two methods — with metal right angle brackets, or with similar brackets made of wood. Two for each leg fixed at the outside ends will make a strong job.

Finishing off the tray should not present any difficulty and after well glasspapering, two coats of good enamel paint in a pleasing shade will make a very attractive article. If you have used an oak or mahogany faced plywood and the mouldings match, then french polish or varnish would be suitable.

To make a really first class job the tray could be lined with one of the plastic materials now on the market in a large variety of colours and patterns.



Books to Read

Chemistry Magic

by Kenneth M. Swezey

A SIMPLE textbook with many excellent photographs, this latest scientific work by a universally acknowledged authority is sure to prove of great interest and value to all home or school chemistry enthusiasts. It contains nearly 200 fascinating experiments performed with the minimum of apparatus, the most interesting aspect of these demonstrations being their application to everyday life. Here is the answer to the teenage chemistry-set fan, the student chemist, and, indeed, to the science master himself who is looking for a work which will demonstrate, through practical experiment, how chemistry is applied to modern industry. Published by *Nicholas Kaye Ltd.*, 194-200 Bishopsgate, London, E.C.2—Price 17/6.

Jewellery Making

by Greta Pack

AS its title implies, this is a work manual for the novice, and, to emphasise its claim to be written for children, almost each page is illustrated in the bold clear style of a child's

picture-book depicting step by step progress in the fascinating construction of jewellery from various metals. Everything, from the few essential tools to the finished piece of craftsmanship is most entertainingly described.

Published by *Messrs. Macmillan & Co.*, St. Martin's Street, London, W.C.2—Price 21/-.

Complete Book of Wood Finishing

by Robert Scharff

AS any woodworking project can be enhanced or spoiled by the finish given to it, this work, with its complete survey of all the methods of wood finishing, is a most important contribution to the world of 'do-it-yourself'. From the opening chapter on woods to the concluding section dealing with the latest ideas in decorative finishes, this well illustrated volume explains in easy language the step-by-step stages of preparation, filling, sealing and the ultimate appropriate finishing. There is also a valuable chapter on reviving the finish of old furniture and the repairing of cracked or scratched surfaces.

Published by *Faber & Faber*, 24 Russell Square, London, W.C.1—Price 25/-.

Picture Framing

USING only hardboard, picture framing and a glass substitute you may make some really modern, attractive pictures with a minimum of trouble.

The size of the actual picture will help you to determine the size of the frame but it should be noted that where it is proposed making a miniature picture gallery the whole series should be considered at the same time. Larger pictures can be trimmed down to a uniform size, irrespective of whether they happen to be horizontal in format or vertical, for it is possible to employ identical frame sizes by merely modifying the mounting.

Fig. 1 shows a set of three pictures, including vertical and horizontal types, revealing the best mounting treatment although they need no necessarily be hung in a straight line. They may be stepped downwards or hung vertically if desired. Always allow for at least 2ins. at the top and sides, with 3½ins. at the base for vertical pictures, making a series equal. It will then be an easy matter to adjust a horizontal picture to fit the same size of frame.

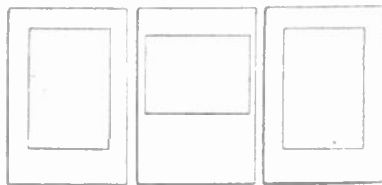


FIG 1

It will be seen that when using an average size of picture say 6ins. by 4ins., the hardboard should be 11½ins. by 8ins., although there is no hard and fast rule about the width of the border. Examination of a few pictures in the shops will be useful in this respect.

Before proceeding further it is advisable to measure for the picture framing, a section of which is shown in Fig. 2 and obtainable from Hobbies Ltd. Make quite sure that the hardboard is square at the corners. Later we will deal with the making of the frame but at the moment we are concerned with the backing.

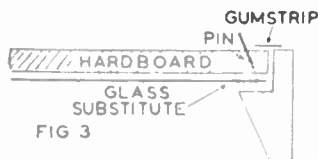
The hardboard is to act as the backing for our picture and the mount itself, the idea being to paint the smooth side in any chosen colour. Since hardboard is extremely absorbent you are recommended to apply a priming coat of thin paint or a sealer and, after drying, your choice of colour. Any colour of paint to

match existing decorations may be used but perhaps the best results are produced by applying contrasting colours like pale green, pale pink, pale blue or pale cream, yet related as near as possible to the general colour tones of the picture. It will be realised that this does not apply with equal force to black and white photographs, but it is immaterial whether you use a matt or glossy finish. Incidentally, we may mention that it is possible to apply a piece of wallpaper to the hardboard providing the pattern is not too dazzling.

When the paint is perfectly dry the picture is mounted in position with a good adhesive or a rubber mountant. If the latter is used it will be found quite easy to rub away any surplus after the print has been allowed to dry.

If you wish to provide a protective covering in the form of a glass substitute you may use a transparent material as supplied by Hobbies Ltd. A piece 9ins. by 12ins. costs 1/6. When

FIG 2



framing smaller pictures this refinement is not always necessary, yet it does ensure the picture keeping clean. It almost goes without saying that the transparent material should be cut to the same size as the hardboard.

The picture framing is cut to fit the hardboard backing and mitred with the aid of a mitre box at each corner in the usual manner, but the modern effect is obtained by colouring this framing separately and in contrasting colour. White is extremely popular, but you may use black, red or what you will, and in some cases the effect is increased by finishing the outside edge in another distinctive colour. The best method is to prepare the beading, apply glue to the corners and allow to set while held in position by a piece of string, encircling the frame and tied quite tightly. After the glue has set you may paint in the desired colour.



Now lay the painted frame on top of the picture — covered by the transparent material if being used — turn over to the back and fasten with small panel pins knocked in at an angle as shown in Fig. 3 so that they hold the panel in position yet do not protrude on the face of the picture. By using the glass substitute all fear of breakage is avoided, but you should only use fine pins or the wood may split. Three or four pins on each side will be ample, but the amount depends entirely on the size of the picture.

Finally, lengths of gumstrip should be attached all round the back where the hardboard and framing meet so as to seal against dust.

Some method of hanging is essential and here you may screw in some small picture rings, but do make certain that they do not pierce the hardboard or your work will be ruined. Alternatively, you may attach some small, linen fasteners with a ring provided which can be glued to the back of the picture and these will be quite suitable for light pictures of this description. The normal type of picture frame with glass often has a panel pin knocked in the framing at each corner and you may do this to make quite secure, but since the framing is attached to the hardboard and glued at the corners, such pinning may not be necessary.

Neat mitring is essential and care should be taken to see that the hardboard is accurately cut. You will find that having your own choice of colouring for the framing and mounting makes all the difference and will provide you with lovely pictures at small cost. (S.H.L.)

TRICKS WITH PAPER

HERE are some easy tricks for you to do using newspaper as a basic material and you are recommended to experiment with them in the order given.

In Fig. 1 we show a ladder made by rolling and cutting a tube made from a strip of newspaper measuring 4in. by 40in. The actual width does not matter greatly but it is essential to make the length ten times the width. You will see from Fig. 2 that the paper is rolled into tube form with a hole in the centre approximately $\frac{1}{2}$ in. in diameter. The outer end should be coated with gum or paste to fasten securely.

Using a pair of scissors, or a sharp knife, remove half of the tube as shown in Fig. 2 so that there is about 1 in.

the length of the tube so that these finish about $1\frac{1}{2}$ ins. from one end, and as shown by the dotted line in Fig. 4.

This time the cut parts are opened and flattened out as shown in Fig. 5, and it will be seen that the remaining

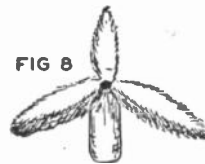
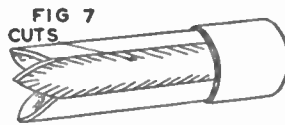
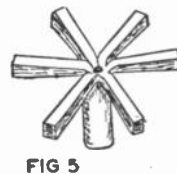
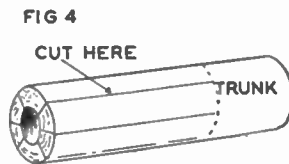
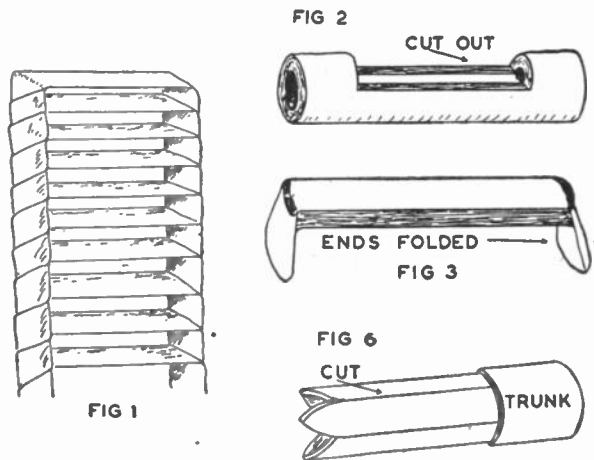
By S. H. Longbottom

1½ ins. now forms the trunk of our tree. The latter is held by one hand while the other separates and draws up the top leaves of each of the flattened parts,

tened temporarily with a paper clip.

Now make three cuts in the green tube as shown in Fig. 6, extending to the trunk, trimming the ends of these to the shape of a fish head. We now make several tiny snips with the scissors down the sides of each section pointing towards the brown paper trunk. This produces a feathery effect in the finished tree (Fig. 7).

Flatten down the three sections as shown in Fig. 8 so that the leaf parts extend outwards. Hold by the trunk, remove the paper clip and gently pull up the *trunk*. This will lift in the form of a spiral and when considered tall enough the free end may be fastened by paste or a piece of gumstrip. Do not pull out the



remaining intact at each end. With this done the tube is pressed quite flat on the table and the ends folded down as in Fig. 3, so that the cut part is uppermost.

Hold the two turned down ends in one hand, carefully pulling out the top layer of the cut out. Ease out this top rung of the ladder gently with the fingers or a penknife, and it may be found easier if pressure is reduced by the holding hand so that the sides can be lifted. You must not attempt to open out the ladder merely by trying to pull on the top rung, the method being to raise this a little, then the second, the third and so on until the whole ladder is erected. Afterwards the sides are carefully straightened leaving you with the completed ladder.

After this you may attempt production of a fir tree, and for this a paper tube is made exactly as for the ladder. Having prepared the tube make six cuts down

using the same method as described for the ladder until your tree assumes the appearance of a Christmas tree.

Finally we have a palm tree, similar to the others but modified a little, and it may be mentioned that here you may use two colours of paper with good effect.

Two strips of paper are required for our palm tree, one of green paper measuring 4ins. by 25ins. and one of brown paper measuring 2½ins. by 25ins. The latter forms the trunk.

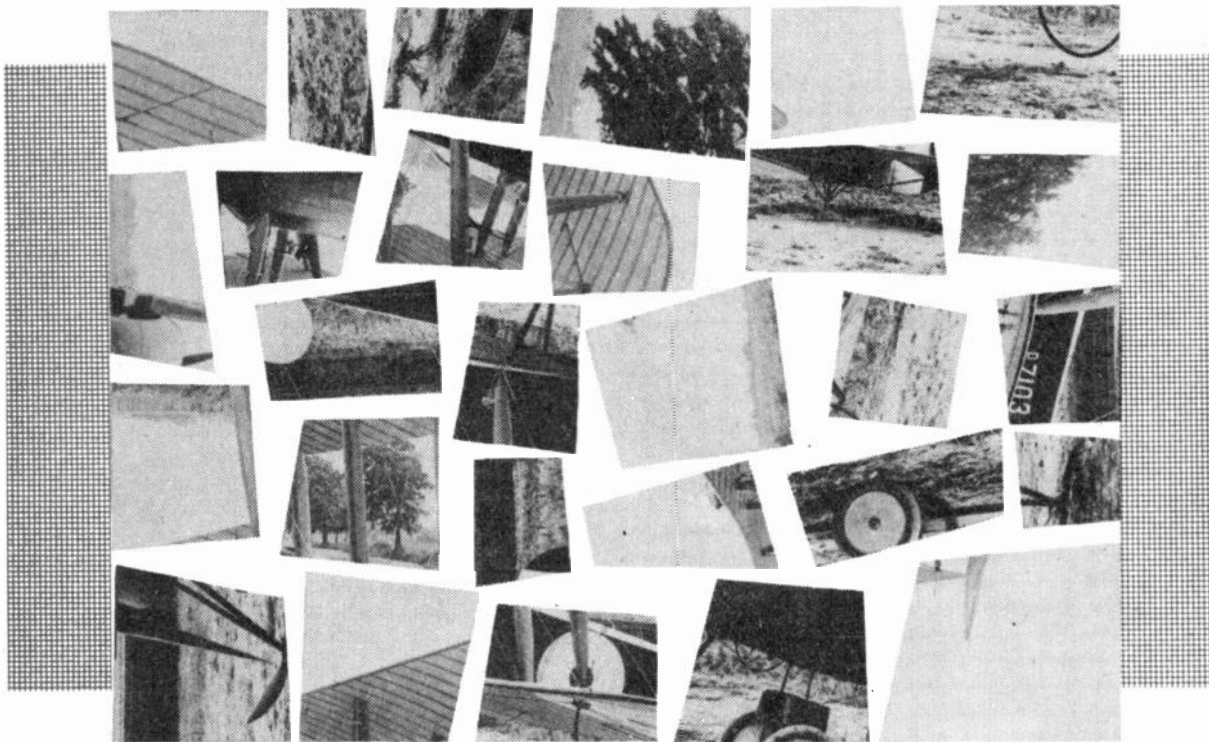
First make a tube from the green paper so that there is a hole in the centre with a $\frac{1}{2}$ in. diameter, easily made by rolling round a pencil. Around one end of this tube we wrap the brown paper after applying a little gum to connect the two parts together. In this instance it is inadvisable to gum the final end of the brown paper but you may find it convenient to keep the loose end fas-

trunk too far or it may become flimsy, and all that is required to finish our tree is the fringing and loosening of the leaves — like a palm tree.

Diagrams of the completed trees have not been prepared in order that you may enjoy the element of surprise, but the foregoing instructions will enable you to make a complete success of these few tricks with paper.

★★★★★★★★★★★★★★★★★★★★★
★ Next week's free design will be for ★
★ a Noah's Ark with drop down front ★
★ and separated into 'cages'. Seven ★
★ animals and a dove will be featured. ★
★ Also other regular features and ★
★ projects. Make sure of your copy. ★
★ ★★★★★★★★★★★★★★★★★★★★★★

AIRCRAFT SPOTTING



FOR our Jig-Quiz this issue, we feature a world-famous training aeroplane which was designed many years ago, and was the forerunner of many well-known light biplanes.

This aircraft made its appearance during the First World War although it was probably for its peace-time role that it is best remembered.

Production of this aeroplane was on an enormous scale and nothing like it had ever been attempted before. Machines were rolling off the production line at over 200 per month and the total war-time production was well above 8,000 machines. In fact a statement was issued in 1918 to the effect that more aeroplanes of this type had been built than any other in the world. The same year production was initiated in Canada, at the factory of Canadian Aeroplanes Ltd., the Government-sponsored undertaking which had taken over the Curtiss works and staff at Long Branch, Toronto, late in 1916. The initial contract was for 100 machines but only one, or at the most two, had been delivered by the time of the Armistice.

The reputation of this aeroplane

spread as far as the United States. The British Liaison Officer in Washington, Colonel Lee, was of the opinion that it was the finest trainer ever built, and he had one sent to America during the

By G. Allen

winter of 1917-18. After making several demonstration flights over the city, the Americans decided to acquire a sizeable quantity but could only obtain a few machines which they used for instruction in aerobatics.

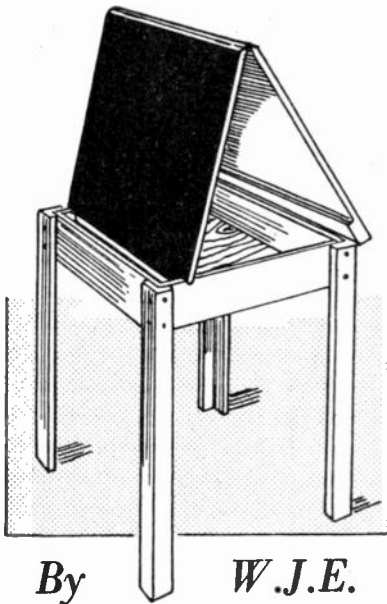
The post-war use of this aeroplane was considerable, with many foreign countries adopting it exclusively for training purposes, and manufacturing rights were granted in Japan, Belgium, Australia and Canada. Many enthusiastic ex-R.F.C. officers had them converted into three-seaters for joy riding flights at seaside resorts and it is estimated that more than 200,000 people were carried in this way without accident. These 'barnstorming' days did as much as anything to help make the public aviation

minded, and it is quite true to say that this aeroplane was one of the pioneers of that venture.

With the passing of time and the progress in aviation, the aircraft gradually disappeared from the scene, and all that remained to remind people of its existence were the old faded photographs kept by enthusiasts. Then in 1955 came the news that one of these aircraft, believed to be the only one in existence, was unearthed in a collection of old-type aircraft. Immediately, the designers hit upon the idea of restoring the machine and giving demonstration flights, partly to re-create the atmosphere of the 'old days' and partly because it would be a wonderful publicity scheme. The task was given to the firm's apprentices and what a first-class job they made of it! The machine was finished in a few months and was immediately passed for flying. There must have been some memories re-lived by the early pioneers when the aeroplane took to the skies again that day, late in 1955 — almost forty years since its initial design.

SOLUTION NEXT WEEK

A PLAYTABLE FOR CHILDREN



table, that is the part the child will sit at, a shallow tray is fitted, as at (B). This is a simple affair, consisting merely of a 1in. wide strip of thin fretwood, joined to a bottom strip of wood 2ins. wide. The whole is supported in place by nailing to fillets of wood fixed to the inside of the box. This tray will be handy for holding chalks, pencils, etc. Just against the tray, cut out each side a $\frac{1}{4}$ in. deep notch, angular shape, for the lower edge of the drawing board to rest in.

Fig. 2 shows a side view of the completed table, and reveals, by the dotted outlines, how the table top and drawing board are brought in position. For the legs of the table cut four lengths of $\frac{1}{4}$ in. wood to the length given (or longer, if a

A SEPARATE table for a child, on which to play games or model, is most desirable. The design illustrated serves this purpose well, and has a novel attachment in the form of a drawing board to encourage the child to sketch things for itself and develop any tendencies it may have. The table has, in addition, a box apartment for containing toys, games, in fact anything of small compass.

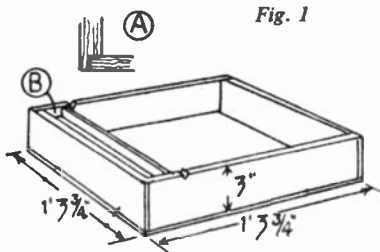


Fig. 1

Construction is quite simple, and the cost in timber reasonable. Make a start by constructing the box compartment, shown in Fig. 1. Any good quality wood, $\frac{1}{4}$ in. thick, can be employed. The dimensions given are the outside ones. For the corner joints, the rebated joints, shown at (A) should be made. Glue and nail together with oval nails, the nail heads being afterwards punched below the surface and stopped up level.

For the bottom use plywood, $\frac{1}{4}$ in. thick. This is better screwed down than nailed; it makes a stronger joint, especially if strengthened with glue. Near what will subsequently be the front of the

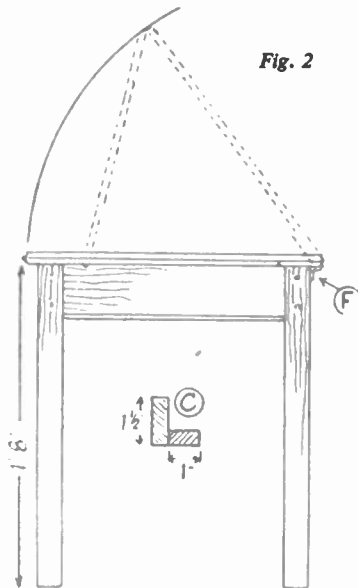


Fig. 2

higher table would be preferred) and $1\frac{1}{2}$ ins. wide, and four lengths of $\frac{1}{4}$ in. wood, 1in. wide. These are nailed and glued together at right angles (see detail (C)) and then fixed to the corners of the box with 1in. round-headed screws. Take care to get the legs all cut to exactly the same length, and then lay the box upside down on a flat surface while screwing them in position. This should ensure a stable piece of work, not liable to rock, or wobble.

The table top consists of two pieces of plywood, $\frac{1}{4}$ in. thick, cut to the outside

CUTTING LIST

Box sides.	(2).	1ft. 3 $\frac{1}{2}$ ins. by 3ins. by $\frac{1}{4}$ in.
Box sides.	(2).	1ft. 3 $\frac{1}{2}$ ins. by 3ins. by $\frac{1}{4}$ in.
Box bottom.	(1).	1ft. 3 $\frac{1}{2}$ in. by 1ft. 3 $\frac{1}{2}$ in. by $\frac{1}{4}$ in. ply.
Legs.	(4).	1ft. 6ins. by 1 $\frac{1}{2}$ ins. by $\frac{1}{4}$ in.
Table top.	(2).	1ft. 6ins. by 1ft. 6ins. by $\frac{1}{4}$ in. ply.

FITTINGS

2 pairs 1 $\frac{1}{2}$ in. solid brass butt hinges, with screw. ($\frac{1}{4}$ in.).
1 small metal button.
16 1in. round headed screws.

dimensions given at Fig. 3. One piece is left intact, the other is divided into two parts (D) and (E), as shown in the diagram. Part (D) is glued to the underside of the first panel, which actually is the top of the table. Part (E) is hinged to this latter part, at its bottom edge. The hinges should be recessed in both surfaces to enable (E) to fold up flat to the top panel. The side view, in Fig. 3, ex-

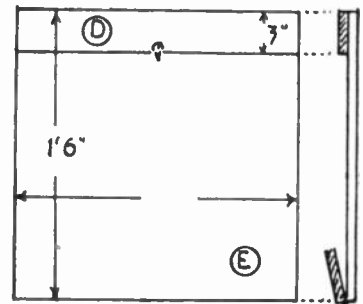


Fig. 3

plains this. The whole is then hinged to the box, the hinges being screwed to the legs, not the box, as at (F), in Fig. 2.

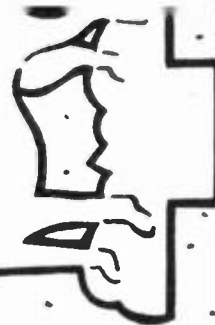
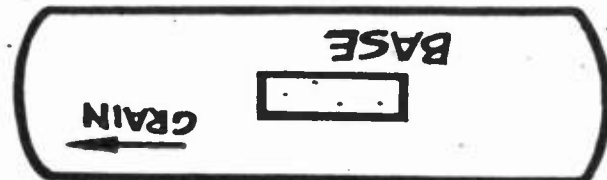
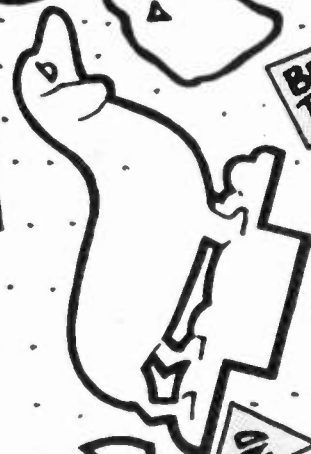
This completes the work of construction. Give the table a clean up with glasspaper, after stopping up all the nail holes. Level the edges of the table top and make everything smooth to the touch. The face side of the drawing board can be given two or three coats of black-board paint. A small metal button should be fitted to part (D) (shown in the diagram) to keep the drawing board from falling forward when the top is lifted up to gain access to the box below.

The remainder of the job can be stained and varnished, or painted, as preferred.



Patterns for

12





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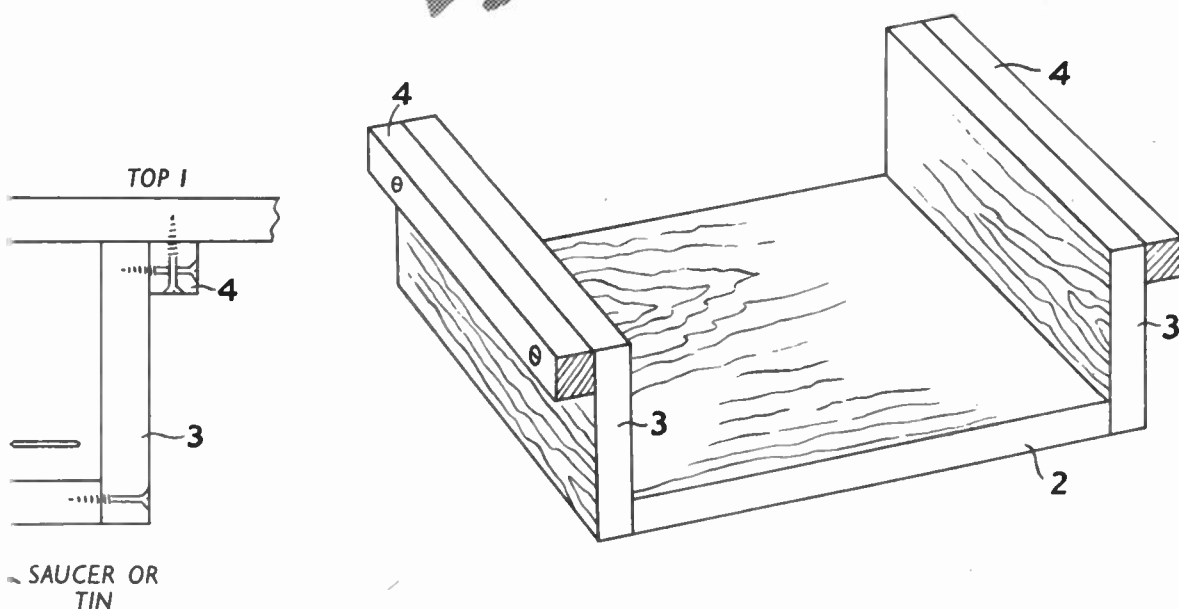
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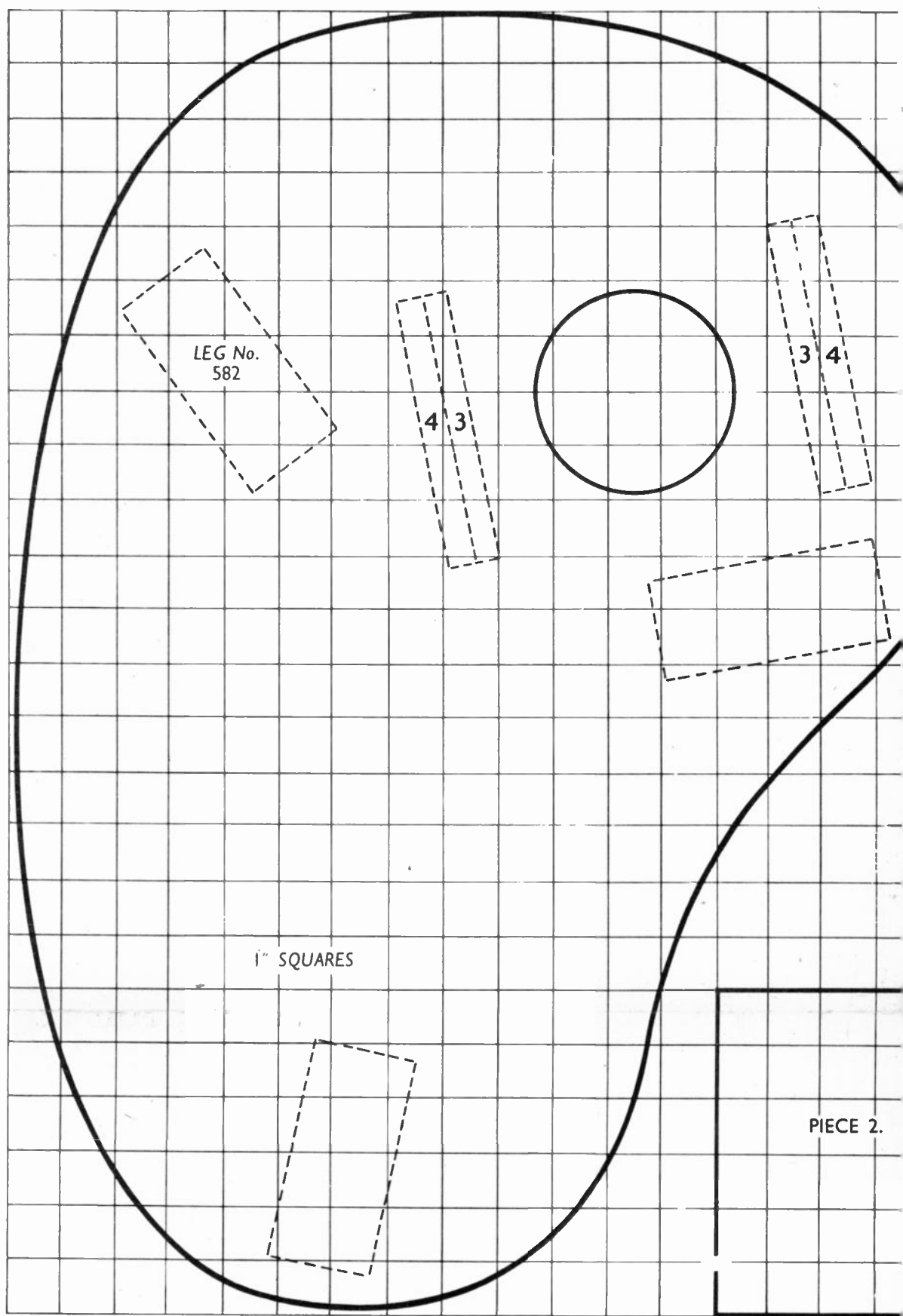
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**A Simple Job
for the
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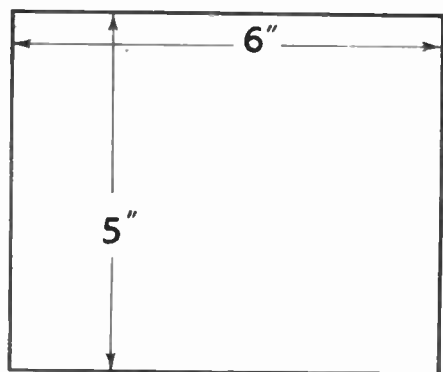
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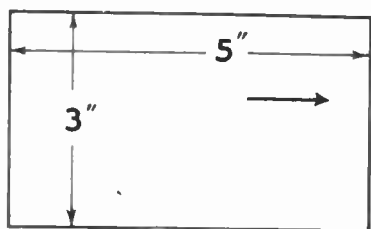
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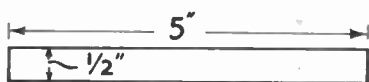
PIECE 1. CUT ONE 1 2 in. PLYWOOD.



PIECE 2. CUT ONE 1 2 in. PLYWOOD.

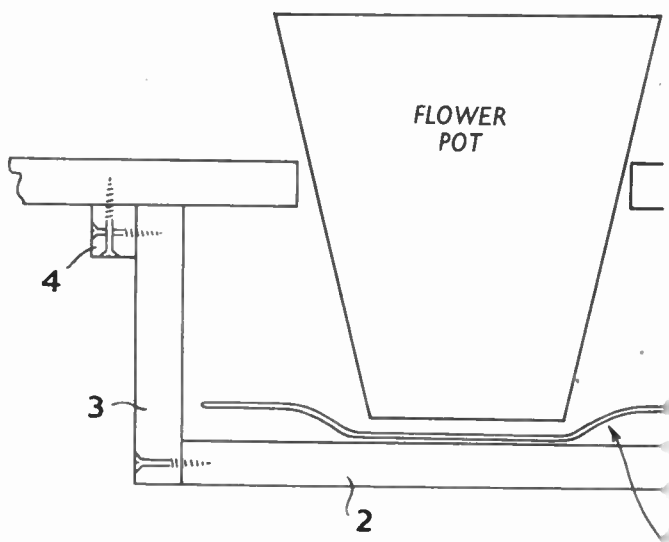


PIECES 3. CUT TWO 1 2 in.

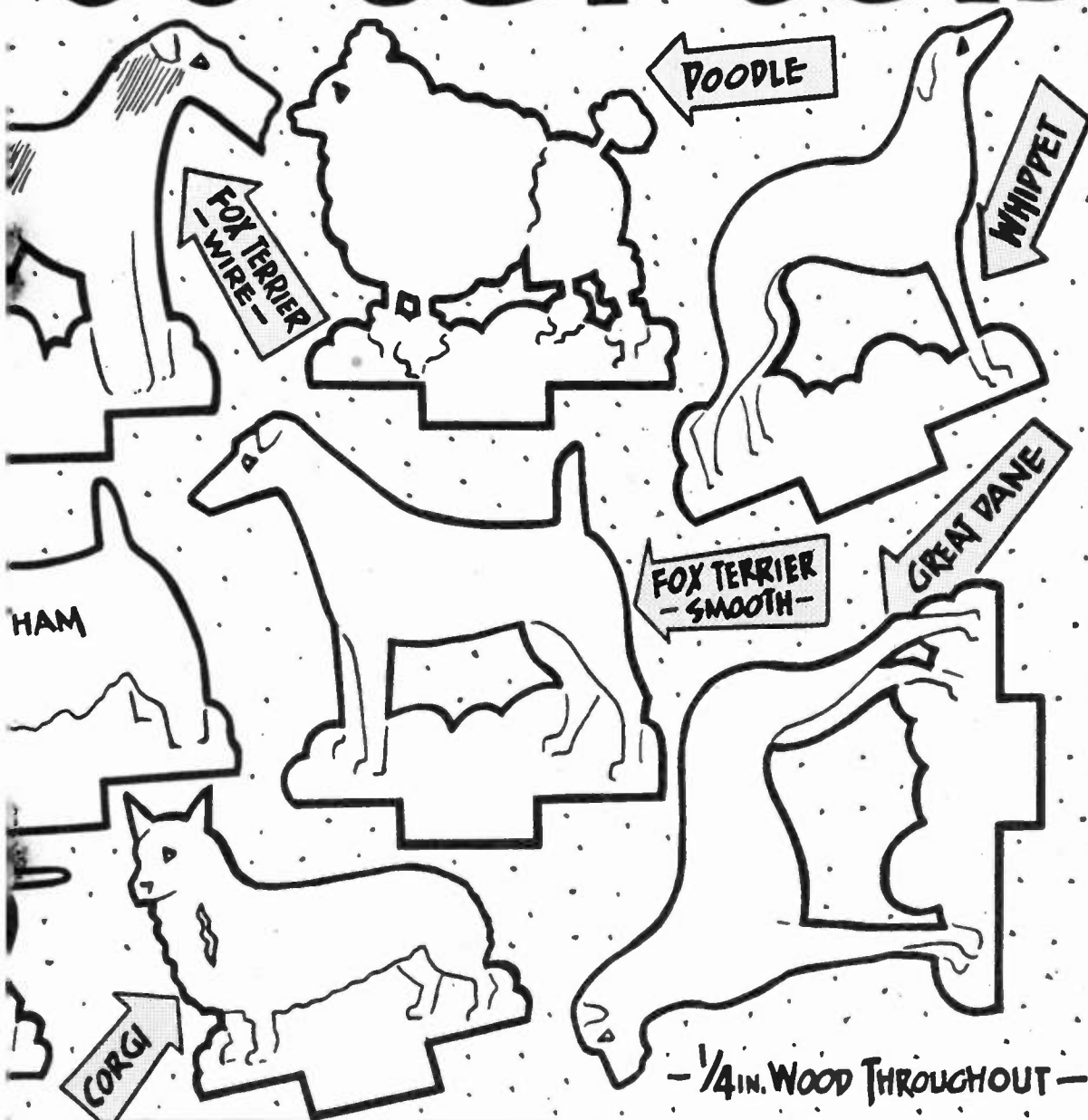


PIECES 4. CUT TWO 1 2 in.

THE ARROW
DIRECTION
OF



DOG CUT-OUTS



Make it yourself

EASEL FOR OIL PAINTING

MANY would-be oil painters are deterred from beginning by the relatively high cost of the necessary equipment. Much of it, however, can be constructed at home from simple materials at very little cost. The largest, if not the most important piece of apparatus is the easel; of the available factory-made easels the cheapest ones are necessarily either small or of limited use, or both. The more elaborate, and therefore more useful ones, are understandably expensive.

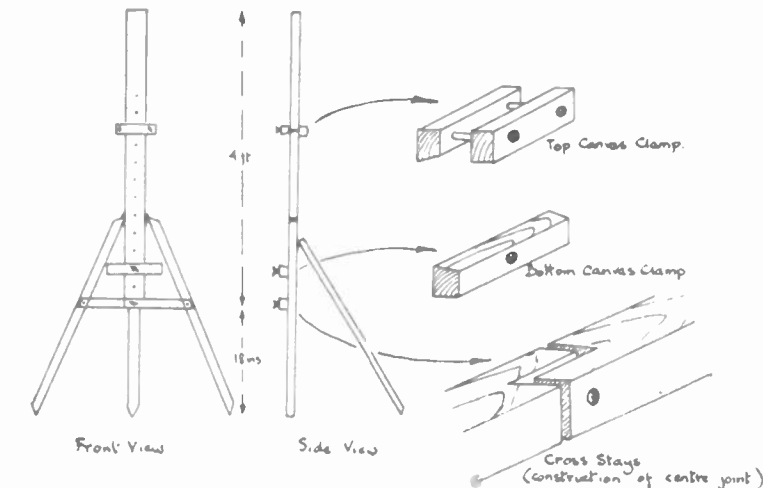
Here then is an easel which is quite simple in design and construction but quite capable of very useful service. It is what I would call a semi-folding type of easel. By this I mean that it can be folded sufficiently for easy and convenient storage in the home but not enough to make it easily portable for a lot of field work. But of course, the more it is made to fold the more complicated it becomes.

The general construction may be seen from the accompanying diagrams. The height is shown as 5ft. 6ins., but by varying the measurements of various pieces, the easel may be made to any convenient size according to individual needs and preferences or perhaps to suit whatever timber happens to be available. Some people like to paint while seated, some standing up and others in both positions from time to time. If the easel is made up approximately to the height and proportions shown it will be suitable for painting in either position and on any size of canvas likely to be used by an amateur painter. The canvas clamps are adjustable so that the lower edge of the canvas can be at any height from about 20ins. to upwards of 4ft. above floor level in 2in. steps.

Central 'spine'

The easel consists of a main central 'spine' 4ft. in length by 1½ins. to 2ins. wide by ¾in. thick. To this all three legs are hinged and the canvas clamps are carried upon it so that it serves as the main chassis member of the easel. The legs are made from 1in. batten and are about 3ft. long. The two side legs are hinged on to the spine about 15ins. or 16ins. from its lower end and the rear leg is hinged to the back of the spine an inch or two lower down. When the legs are opened the two front ones are held rigidly in place by a cross stay.

This is made in two pieces which meet in a loose halved joint at the centre and are held tightly in position by a ½in. coach bolt and wing nut passed right through



them and through the lower end of the spine.

The outer ends of the cross stay pieces are fixed to the legs by means of two stoutish brass round-headed screws (with a small washer under each head), about which they are able to pivot but not too loosely. All three legs are pointed so that they will not wander or slide away when the easel is used on carpet, grass or similar soft surface. If, however, it is likely to be used on linoleum, polished boards or any smooth surface, then it may be necessary to fix a cord or thin chain from the rear leg to the bottom end of the spine by means of small screw-eyes in order to prevent the leg from sliding backwards. The length of the cord should be so regulated that the easel stands as nearly vertical as is possible without upsetting the balance of the easel.

The construction of the canvas clamps is shown in the enlarged detail. The top one consists of two pieces of 1in. batten, about 5ins. long, clamped together and embracing the spine by means of two ½in. coach bolts and wing nuts passing through the two pieces, one on either side of the spine — not through it. This clamp is thus capable of sliding up and down the spine and being clamped at any point.

The lower clamp is one piece of 1in. batten somewhat longer than the top clamp in order to provide additional support for the canvas. It is held in place by a ½in. coach bolt and wing nut passing

through one or other of a series of ½in. holes drilled at intervals along most of the length of the spine. Both clamps are planed to an angle so that the edge in contact with the canvas tends to thrust the latter back towards the face of the spine rendering it unlikely to fall off.

Cost about 5s.

Most factory-made easels are constructed from beech or mahogany but common deal serves the purpose adequately even if it does not look quite so decorative. My own easel is actually made from a few feet of second hand 2in. by 1in. rough deal, four coach bolts, three hinges and a few screws, — total value perhaps 5/- or 6/-. Of course it is always possible to improve the appearance of the easel with a coat of lacquer or varnish.

When the easel is not being used it may be folded by removing the bolt in the centre of the cross stay, pivoting the two halves of the latter upwards so that they lie on the two front legs. Then all three legs are brought together and a strap or piece of cord passed round them to hold them.

(H.H.E.)

SOLUTION TO CROSSWORD No. 17 PUBLISHED LAST WEEK

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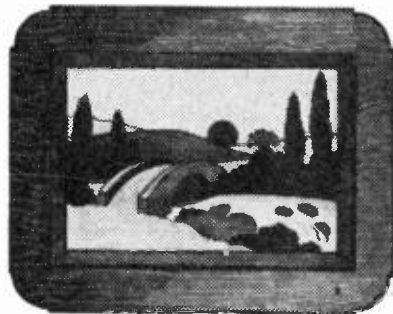
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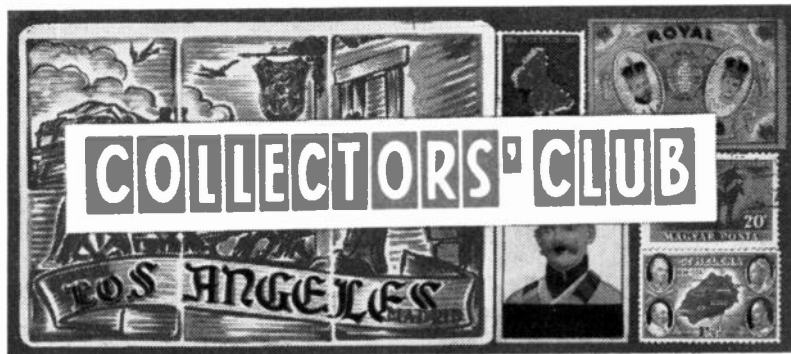


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PORTUGAL is a country really carved out of Spain, but the greatest insult you can pay a Portuguese is to mistake him for a Spaniard.

The Spaniards smoke at all times and everywhere; the Portuguese, up to a recent date, abominated smoke in any form, while they take snuff perpetually. In Spain the women wear shawls, and the men cloaks; in Portugal the women wear cloaks, and the men shawls.

PORTUGAL

— By R.L.C.

Lisbon (the capital) was founded about 1200 B.C. by the Phoenicians. For situation it is almost unequalled. Many of the streets are narrow, so that to a stranger Lisbon is very like a maze. Its harbour can shelter 10,000 ships. It was in 1775 visited by a fearful earthquake. In five minutes 50,000 souls perished.

Oporto, the next largest town, is chiefly known as the place from whence the Portuguese wines are exported, and especially that which derives its name from the town.

Festivals popular

Portugal is rich in popular festivals. Many are held in September, celebrating the grape harvest and safe return of the fishing-fleets. All begin with Mass, followed by processions of people in regional costumes, the girls wearing the characteristic crochet stockings and backless slippers; then there is feasting and dancing.

In June occur the feasts of Saints Anthony, John and Peter, and on the 13th of every month, from May to October, great processions and festivals are held at the Shrine of Our Lady of Fatima, near Tomar.

Stamps: 1926. 96c. black and red —

Independence Monument, Lisbon — 3/- mint. 1931. 40c. brown — Lisbon Cathedral — 6d. used; 75c. red — St. Anthony — 2/- used. 1941. Various Costumes — set of 10, 3/- used. 1950. 50c. green — Our Lady of Fatima — 2d. used.

Certain parts of the Peninsular are for ever famous because of the valiant deeds that were done in them. Cape St. Vincent calls to mind the battle between the English and Spanish fleet, in 1797, when fifteen small English vessels, under Nelson and Jervis, defeated twenty-seven Spanish vessels, capturing four of them outright.

In the famous Peninsular war, Salamanca, Corunna, Vittoria, Talavera, Ciudad Real, Badajoz, Saragossa, were

all scenes of glorious victories over the French.

Stamps: Barbados 1906. 1d. black and red — Nelson's Monument — 2/- used. Great Britain 1951. 2/6 green — H.M.S. 'Victory' — 9d. used.

Portugal is essentially a seafaring country. Along the coast the fishing fleets — the boats brilliantly painted, and with square sails — are a picturesque sight.

Stamps 1951. 50c. green on buff — Fisherman — 2d. used. Match labels: 1956 — Life-belt and Anchor — 1d. mint.

In 1910 Manuel II, last of the Braganza kings, abdicated. Since then, Portugal has remained a republic. The colours of the Monarchy were blue and white, but after the revolution, they were replaced by green and red. The Arms of the Monarchy, unchanged for centuries, were retained and appear on the flag in the centre of a golden armillary sphere. The blue shields on the white ground are in memory of the victory of Alfonso Henriques in 1139 over the five Moorish Princes at Ourique, and the five white circles on each symbolize the five wounds of the Saviour who gave Henriques the power to win.

Stamps: 1940. 1e. 75c. blue — Alfonso Henriques — 6d. used. 1910. 5 r. black — King Manuel — 1d. used. Match labels: 1956 — Medieval Knight — 1d. mint.

In some parts of Portugal the people are poor. They are good-natured, and, if well treated, will work hard for little pay. Card playing is a favourite home pursuit.

Match labels: 1956 — Homestead — 2d. mint. 1957 — Four Aces — 2d. mint.

Stamp and label collecting is very popular—so why not seek a pen friend from that country?

As announced last week, Mr. R. L. Cantwell will be happy to give readers helpful individual advice and information on this and all aspects of collecting. Address your letters c/o The Editor, *Hobbies Weekly*, Dereham, Norfolk, enclosing a stamp for reply.



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Start a Bird Study Group

BIRD watching, besides being a most fascinating hobby, can teach us quite a lot about our feathered friends. Much has been written on the subject but there is a vast amount of information yet to be found out.

Good work is being done by bird watchers everywhere, and the observations they make, either singly, or, better still, in organized groups, is helping to augment our knowledge of ornithology.

Interesting though it may be to study by oneself, this interest is increased many times when a group of people carries on the work together. It is therefore the intention of this article to show some of the things that can be done by starting a bird study group among your friends.

In the first place the group should be kept quite small, and about half a dozen of your friends would be a good number to start with. When there are many more than this it would be better to start another group and to meet occasionally for the exchange of notes. By keeping the group small the indoor meetings can be held at each other's homes whenever possible.

A secretary should be appointed to take charge of all clerical work; to make arrangements for the meetings and outings, to keep and tabulate the various notes gathered by each member and to see that the group is run smoothly.

Meet regularly, say once a week and the group activities can be carried on throughout the whole year. More outdoor work will of course be done during the summer, but there will be much to discuss by the fireside in the winter months.

Keeping accurate records of all observations is most important and each member should have a small notebook to carry around and jot down everything seen or heard, however small it may seem at the time. Often these seemingly unimportant items may prove of great value at a later date, therefore nothing should be too small to record.

Maps can be extremely useful for plotting the territories of various birds or for making a chart of the nests in the district. The Ordnance Survey is probably the best set of maps for the job and can be obtained quite reasonably in the scales of 1in. to the mile covering the whole district, and 6in. to the mile showing the local surroundings in more detail. Then there is the 25in. to the mile map which will give the immediate neighbourhood in minute detail and is

excellent but somewhat more expensive.

Much can be learned about birds from the house, and it is a good idea for each member to erect a bird table and to watch this carefully. Even if you have no garden, or live in a flat with no such facilities, it is generally possible to arrange something on the window sill.

As a guide to the identification of the different species certain books will be needed. It is not necessary for a member to have to purchase many different works, but it is helpful if all members undertake

By A. F. Taylor

to buy at least one each, and if it is arranged for these to be different in order that they may be lent round the group. The secretary should have a list of all the books, the persons owning them and to whom they have been lent.

The Observer's Book of British Birds is an excellent pocket reference book and is reasonably priced at 5/-, but there is a very large assortment of others for use outdoors or for reference at home. James Fisher has written a very useful little book called *Watching Birds*. This is a Penguin Book and should prove extremely helpful when planning the work of the group.

The local branch of your County Library, too, should be a source of further literature for study or reference and it usually has a wide range of books on the various aspects of bird life.

Where you live will, to a certain extent, determine the type of birds you see and the kind of work the group can do. It is obvious that sea birds will rarely invade large cities nor will many woodland kinds be found at the seaside. You must, therefore, plan according to your environment.

Large industrial areas may not have many varieties of bird life but there are always parks, gardens, and perhaps woodlands within fairly easy distance. When going out on a trip however, remember never to trespass on private property. It is generally possible to get permission from the owner of the park land, woods and private waterways.

If you explain the object of the group you will receive helpful co-operation in most cases. Farmers also are only too willing to allow you to make your observations on their land when they know you are not out to do any damage. It is an advantage to get written permission,

then you will have evidence to show if stopped by the police, a game warden or water bailiff.

The work that a bird study group can undertake is almost limitless but we make a few suggestions here to help you to get started.

To commence with, you can compile a Tally List of the different birds seen within a certain area and if possible an approximate estimation of their numbers. You might choose one particular species and learn all you can about them or perhaps your interest will be confined to the kind of food they eat.

Make a map of a particular district and find all the nests within this area. Mark them in carefully and study their distribution. If possible find the number of eggs each nest contains without disturbing the birds and this information can be compared each year.

The singing of birds is yet another line for investigation and you can make a chart showing the days throughout the year when each bird is heard.

A study of courtship and the behaviour of pairs during the breeding season will prove very interesting and may bring new facts to life.

If you possess a large garden, besides setting up a bird table and bath you can erect nesting boxes in appropriate places or prepare a bird sanctuary.

Making a careful study of their roosting habits, how birds react to weather changes, or on their different methods of flight or gait, are but a few of the many jobs for a group to undertake.

To help in your observations at least one member of the group should own either a telescope or pair of field glasses. Do not get too high magnification otherwise the field of view will be too small. Something between x6 and x8 will be found best for general work.

A camera too is very helpful and much useful work could be undertaken with it. This opens up another vast field of study.

When the weather is too bad to go out, the notes made by the members of the group can be sorted out, tabulated and entered up as a permanent record. Some people use stiff covered exercise books, while others prefer a loose leaf book or a card index, and the system you adopt will be governed by the type of work undertaken.

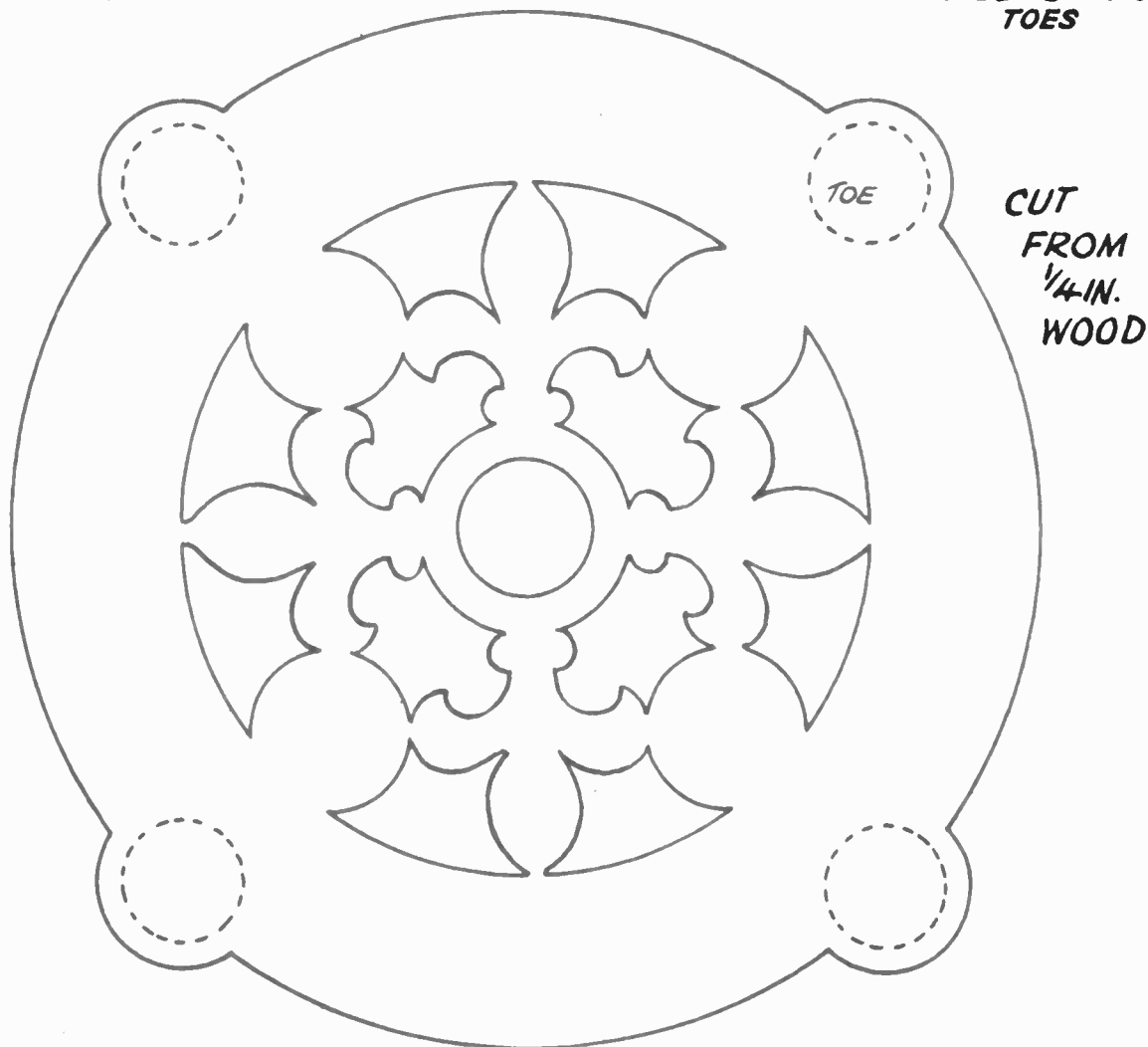
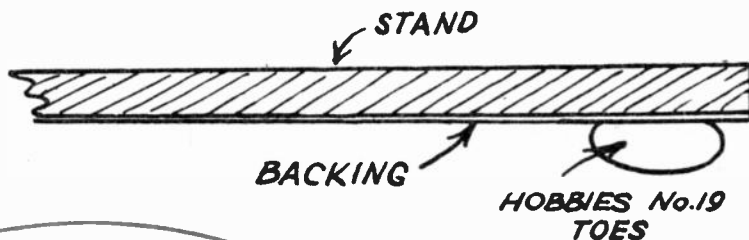
Whatever the kind of study involved you will be making new friends both among the birds and fellow bird watchers as well as doing a good job of work in the interests of ornithology.

With 'Scout' motif

FRETWORK TEAPOT STAND

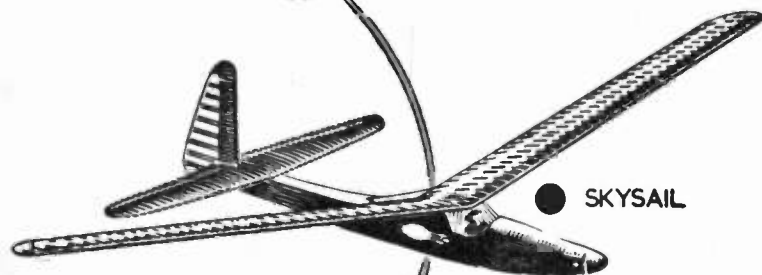
CUT out the stand from $\frac{1}{4}$ in. wood or plywood. The interior frets should be cut first and then the outline. Clean up with glass paper and give two or three coats of heat-resisting enamel or clear lacquer.

Glue a piece of contrasting backing material underneath as shown by the section on the right. Finally glue four Hobbies No. 19 toes or four small circles of $\frac{1}{4}$ in. wood underneath. (M.p.)

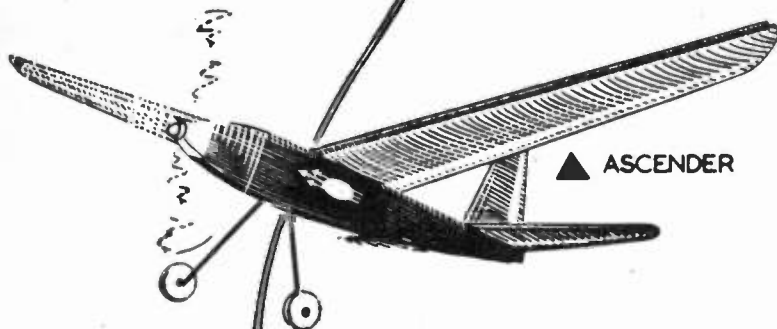


OUT of the BLUE

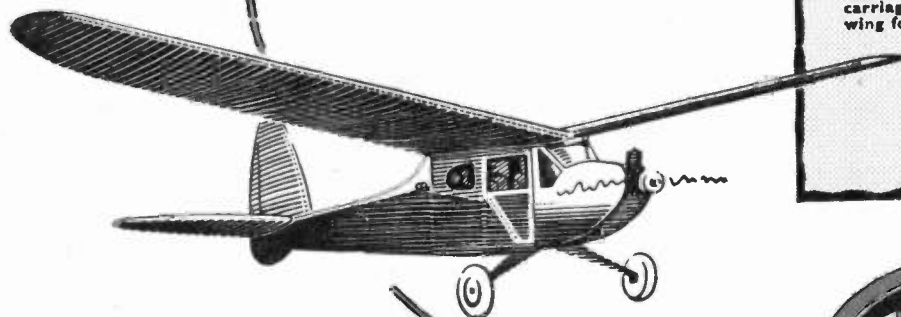
SUPER AIRCRAFT KITS



● SKYSAIL



▲ ASCENDER



★ CHAMPION

EXCLUSIVE FEATURES

These kits introduced by Hobbies have many important exclusive features. Designed to give top performance in their various classes. All sheet parts are die cut and there are super detail plans. Easy to build and fly.

● SKYSAIL — A 36in. wing span glider for tow launching. 'Wing-saver' tow hook—printed dummy pilot — anti-warp wing bracing — jig-lock fuselage alignment.

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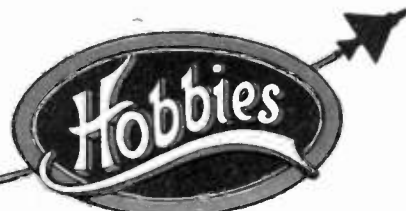
▲ ASCENDER — A 30in. wing span rubber duration model. Adjustable pitch propeller with replaceable blades — fixed tail surfaces for positive trimming — anti-torque automatic-action rudder.

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★ CHAMPION— A 36in. wing span free flight power model. Suitable for .5, .75, .8 and 1 c.c. motors. Opening cabin door and complete cabin details — scale type light alloy undercarriage — optional polyhedral wing for high power.

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