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THE ORIGINAL
'DO-IT-YOURSELF'
MAGAZINE

HOBBIES *weekly*

FOR ALL
HOME CRAFTSMEN

Instructions for making . . .

Also in this issue:

A CONTEMPORARY
'WEATHER' BRACKET

COLLECTORS' CLUB

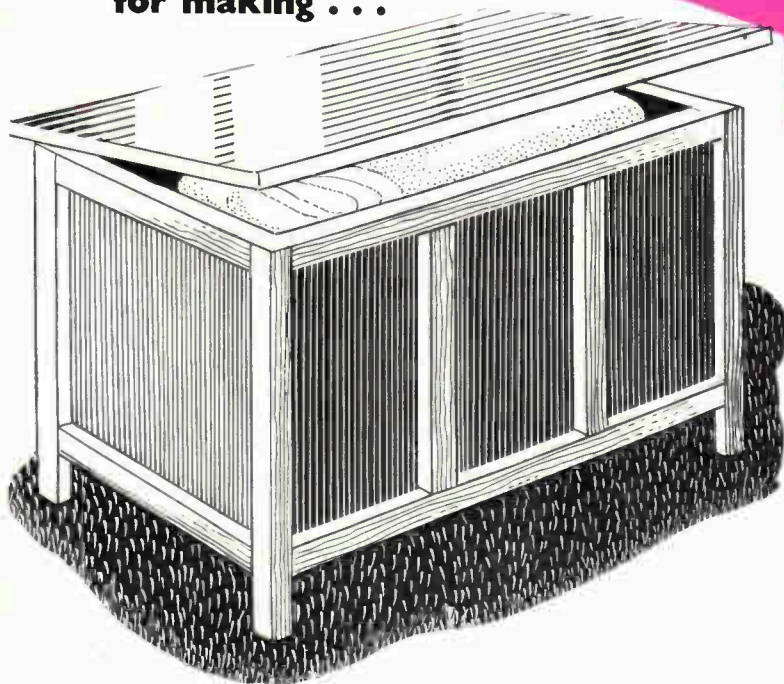
MAKING DOUBLE
EXPOSURES

PATTERNS FOR A
MODEL MINI-CAR

MAKING DOLLS
WITH SHELLS

PLANS FOR NOVEL
THERMOMETERS

ETC. ETC.



BLANKET CHEST

A HANDSOME PIECE OF FURNITURE
FOR THE MODERN HOME



Up-to-the-minute ideas

Practical designs

Pleasant and profitable things to make

5^p



THE Pope has the earliest map of the world. This map, which is drawn on parchment, is about 7 ft. long by 3 ft. wide. It depicts elephants, lions, bears, stags, trees, and galleons. There's also an inscription in

... OF MAPS AND GLOBES

Spanish which reads — 'Universal map, containing all that has hitherto been discovered of the world. Made by Diego Ribero, geographer to his Majesty in Seville, 1529.'

The first map of Canada was published by Guillaume le Testu in 1555. His outline of the North American coast is illustrated with animals and Indians.

The advances of the French settlers are indicated with flags planted in the supposed positions of Quebec and Port Royal.

Maps like these were popular in Shakespeare's time. Othello's stories of vast caverns and men whose heads grew beneath their shoulders probably came from these maps. There's a map of Africa still in existence in which all these and numerous other marvels, natural and supernatural, are depicted.

The earliest-known maps were designed to guide travellers. As men journeyed over more and more of the earth, so their maps became larger and more accurate. Those of the Egyptian geographer Ptolemy (A.D.150), are extraordinarily good considering the period in which he lived.

Today nearly every quarter of the globe is mapped in detail. When new

maps are needed aeroplanes and automatic cameras are used.

A hobbyist's collection should include specialized maps. Motoring maps for example. In them the classes of roads and places of interest are particularly emphasized and distinguished from one another.

The oldest celestial globe is at Naples. It is about 6 ft. 6 in. in circumference and was constructed about 300 B.C. An Arab celestial globe from Valencia dating from A.D. 1080 is now at Florence.

The oldest terrestrial globe is that of Martin Behaim of Nuremberg, 1492.

The first post-Columbian globe is the Lenox globe at New York, 1510.

The first English globes, terrestrial and celestial, are those of Molyneux of Lambeth, 1592.

The globe of Gottorp, erected by Frederick II of Holstein, after a design of Tycho Brahe, represented the earth externally, and the celestial constellations internally. It was presented to Peter the Great in 1713, was nearly burnt in 1757, but restored.

The globe at Pembroke College, Cambridge, erected in 1733, is 18 ft. in diameter. Wyld's globe in Leicester Square, London, was 60 ft. 4 in. in diameter. It was erected in 1851, closed in 1861, and later taken down. One in Paris in 1889 was about 42 ft. in diameter.

Here's another interesting theme for your stamp and label albums. The Americans issue novelty labels depicting maps of the various States and towns. They are easy to get and make a nice show when complete.

Early maps are valuable. So if you find one, maybe between the pages of an old book, submit it to an expert for advice.



Illustrated are stamps and labels on a 'map' theme



These new summer stamps of the Netherlands were issued on April 24th and will be available until June 10th. They depict beach and meadow birds of the Netherlands.

A Contemporary 'Weather' Bracket

MAYBE meteorologists do not depend on its readings when calculating the weather forecast, but a Hygroscope (or weather-house) is nevertheless an interesting home novelty for 'wet and dry' weather-forecasting!

This modern version features the usual cottage, but incorporates in its make-up a flat 'roof' shelf and two wall brackets for displaying miniature ornaments and plants, or artificial flowers.

Cat-gut provides a simple mechanism inside the 'house'. The humidity of the atmosphere will cause it to twist or untwist according to the conditions. In our model we have two amusing little figures which swing in and out of the doors; the umbrella man indicating 'rainy weather'; the bikini girl suggesting 'fine'.

Fig. 1 shows how the house is built up with pieces B, C and D: the whole thing being mounted to the centre of the base 'shelf' A. Piece A is $\frac{1}{2}$ in. or $\frac{3}{8}$ in. wood with sloping ends, cut to the dimensions stated. Two $\frac{3}{8}$ in. pieces of soft wood are used for the sides of the house B. Mark out the doors and the window, and cut these away with a fretsaw on the front panel. The rough side of hardboard gives a 'stone' effect for this piece. The roof is of $\frac{1}{2}$ in. plywood.

Cover the window opening with a piece of celluloid or thin perspex and paint frame-work and curtain details on the inside.

Fig. 2 gives a detail of the mechanism viewed from the rear.

Transfer the patterns of the figures with carbon-paper on to a piece of white

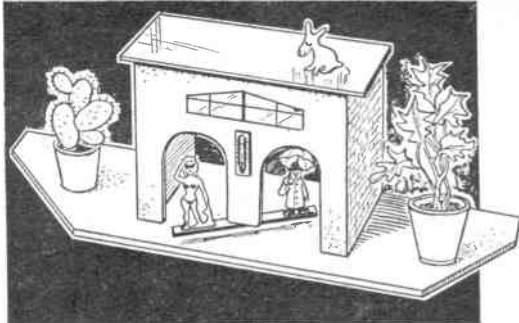
By T. S. R.

paper. Colour with poster-paint or water-colours and paste on to $\frac{3}{8}$ in. plywood. Then cut them out around the heavy outline. Apply a coat of clear varnish or glaze. Cut the mounting strip from $\frac{1}{8}$ in. wood, providing the two slots for mounting a figure at each end, but do not fix these in position until later.

Insert a screw-eye through the centre of the bar. File down the threaded end of the 'eye' so it may 'float' freely in a small hole bored for it just behind the centre column of the house. Glue a small wood block to the top as shown, and insert the knotted end of the piece of catgut (obtainable from sports shops). Attach the other end of the gut to the screw-eye on the bar. Add the figures (do not glue them) and adjust the height of the assembly to obtain a well-balanced floating movement.

A back piece E of thin wood or stout cardboard is nailed to the house and this has holes for hanging on to nails driven in the wall. Stain or paint the shelves and decorate the weather-house with dolls' house papers and gay paint. The roof can be green tile, sides red-brick and front white. A thermometer may be mounted to the front of the weather house, if desired.

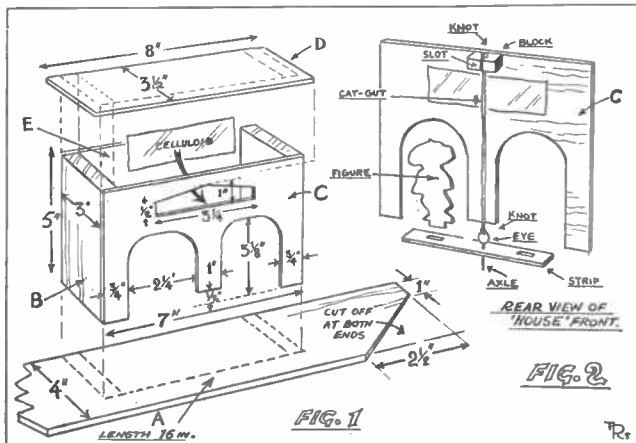
Hang in a position away from the fire and avoid damp walls. Observe which



end of the floating bar emerges during rainy weather and see that the 'fella with the umbrella' is positioned at that end! When the correct places for the figures are determined, they can be glued into the slots.



On right are full-size patterns for figures and balance bar.



HANDSOME BLANKET CHEST

IDEAL for storing your surplus blankets during the summer, this handsome piece of furniture illustrated on the front page can quickly be made by the handyman. To buy a ready-made chest would cost seven or eight pounds but by making it in your spare time you can do it for a fraction of the cost.

The size is 37½ in. long, 21½ in. wide, and 27¾ in. high overall. These measure-

ments can, of course, be increased, but will be found suitable for the average household. The chest is made up as a framework of wood suitably jointed together, and lined with plywood or hardboard. The plywood may be plain birch if paint is to be used, or any veneered plywood to match or contrast with the framing.

Fig. 1 to see the general arrangement and the main measurements. Note that the lid overhangs slightly all round. The side frames are made up as seen in Fig. 2. The two uprights (2) are halved into pieces 1, and the ends of pieces 1 are tenoned as indicated. These tenons must be cut accurately to ensure a good fit when assembling. Use 1½ in. by 1 in. wood for these pieces.

The corner posts (3) shown in Fig. 3

dry. Test to ensure that everything is square and true before the glue sets.

The next step is to screw and glue ¾ in. stripwood all round the bottom, fixing to rails (1) and (4) as shown in Fig. 4. These strips are to receive the plywood bottom.

The sides and ends can now be lined with ½ in. or ¾ in. plywood or hardboard. Plywood can be obtained in

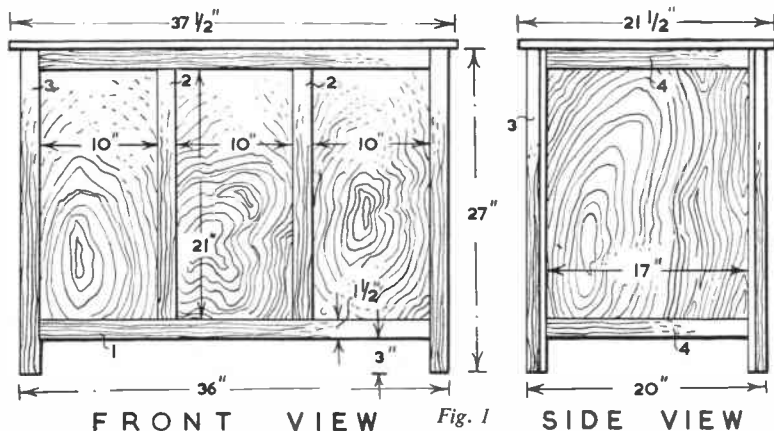


Fig. 1

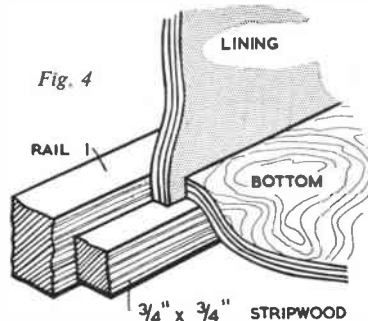


Fig. 4

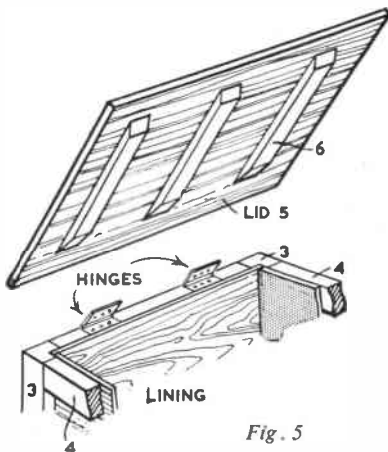


Fig. 5

ments can, of course, be increased, but will be found suitable for the average household. The chest is made up as a framework of wood suitably jointed together, and lined with plywood or hardboard. The plywood may be plain birch if paint is to be used, or any veneered plywood to match or contrast with the framing.

Study the side view and front view in

may be of 1½ in. square material, rebated as in the small diagram, or can be made up from 1½ in. by 1 in. wood, with a ½ in. by 1 in. strip added as shown in the main diagram. This strip should be glued and cramped for strength before cutting the mortises.

Cut the mortises in the corner posts (3) to fit the tenons in the rails (1), and clean them out ready for gluing. Assemble the frames and posts, complete with end rails (4), and set aside to

dry. Test to ensure that everything is square and true before the glue sets. The next step is to screw and glue ¾ in. stripwood all round the bottom, fixing to rails (1) and (4) as shown in Fig. 4. These strips are to receive the plywood bottom. The sides and ends can now be lined with ½ in. or ¾ in. plywood or hardboard. Plywood can be obtained in plain birch faced, which is quite cheap, or in more expensive mahogany, oak, sapele or walnut faces. More expensive still, but very attractive indeed, are the Waverite wallboards, faced with plastic laminate, which are ideally suited for the purpose. The sketch in Fig. 4 shows how the lining and bottom are fitted. The bottom should be ½ in. or ¾ in. plywood. It need not be fixed to the supporting strips.

The lid should be ¾ in. plywood or should be made up of suitable boards glued and cramped together with

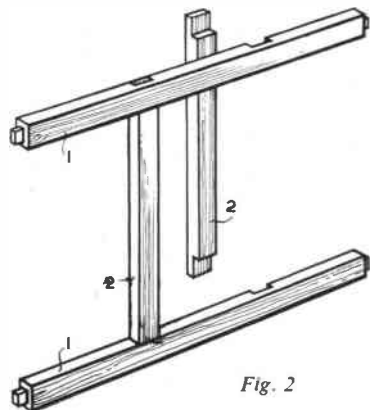


Fig. 2

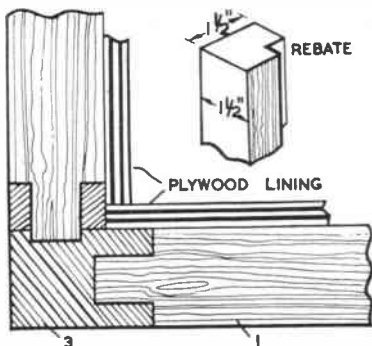


Fig. 3

• Continued on page 117

BUILD HER THIS MODEL CARAVAN

A MODEL caravan on the same scale as a doll's house makes an unusual toy for a young child. The one shown here is easily made, and the dimensions can be altered if necessary.

The base A is $\frac{3}{4}$ in. thick chipboard or blockboard, and is 2 ft. long and 1 ft. wide. The central divider B is also $\frac{3}{4}$ in. thick, and is $11\frac{1}{2}$ in. square. A 9 in. by 3 in. door can be cut in this, and the cut-out section retained and hinged in place if desired. Piece C is $11\frac{1}{2}$ in. by 4 in.

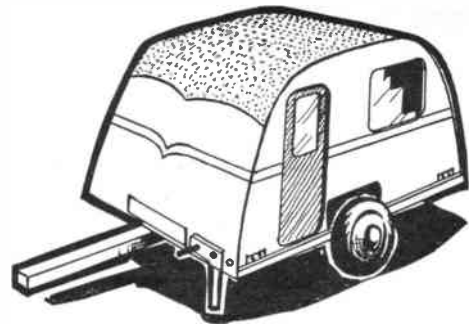
Four 2 in. cubes are screwed to the central divider for support and also for the basis of internal fittings, and the whole assembly is screwed to the base.

The "roof" is of hardboard; a 4 ft. long strip, 1 ft. wide, is first screwed to the upper wooden section C, then the two sides are bent round to meet the edges of the base until the desired roof outline has been attained D. There will be a strip of hardboard left at each end, depending on the curve given to the hardboard. Trim off flush with the bottom of the base. The hardboard should be soaked to facilitate bending, and after fixing, left to dry.

Two 4 in. diameter wooden wheels are screwed to a 12 in. length of 1 in. by 1 in. wood, which in turn is screwed to the underside of the base. A furniture glide over each screw head makes an effective hub cap E.

The two sides of the caravan are of plywood or hardboard, shaped by drawing round the inside of the roof. A 3 in. square window is cut in each side, and a smaller panel, 2 in. wide and 3 in. high, is made in one side to form the upper panel of a dummy door, which is later painted in. The windows are glazed on the inside with transparent sheeting. A $4\frac{1}{2}$ in. wide section is cut in the centre of the lower edge of each of the sides, so that when they are opened outwards on their hinges F it allows clearance for the wheels. The height of the cut-out sections depends on the thickness of the wheels, and should be checked before the side is finally screwed in position. A cupboard clip holds each side in the closed position G.

An L-shaped support for each end H has 3 in. legs, and swivels on a screw as shown. Holes drilled in the horizontal leg, and on each side of the screw



drilled in the end of the caravan itself, enable the support to be locked in the up or down position with a piece of thin dowelling.

The draw bar is a 2 ft. length of 1 in. by 1 in. wood screwed to the underside of the base. Internal fittings, such as bunks, sink, table, and cupboards, can be made of plywood or hardboard, and glued in position.

A grey roof and tyres, with white or cream walls and a brightly coloured stripe, make an attractive colour scheme. (A.L.)

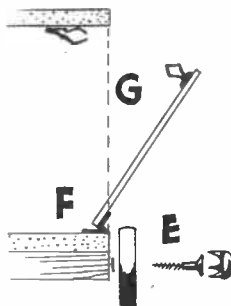
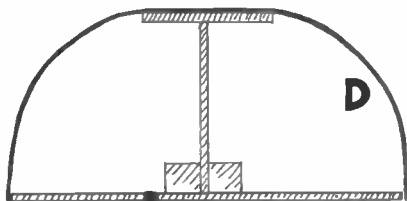
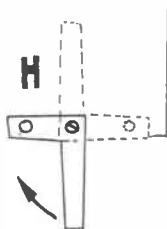
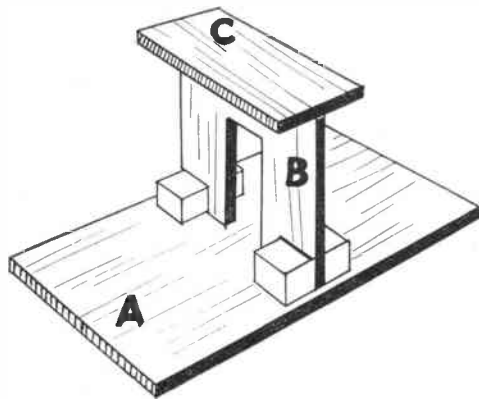
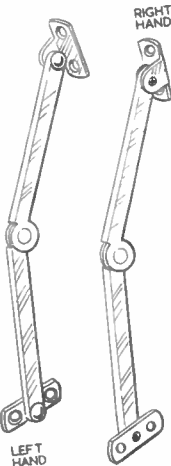
• Continued from page 116

BLANKET CHEST

strengthening battens as shown in Fig. 5. Battens should be about $\frac{3}{4}$ in. thick and $1\frac{1}{2}$ in. wide. Hinges are fixed in suitable positions, and are recessed into the rails to allow the lid to fit flush. Use 2 in. heavy brass butts and countersunk screws to suit.

A pair of lid stays may be fixed to the lid, one at each end. Stays may be obtained from Hobbies Ltd, Dereham, Norfolk, price 2s. each (post 6d.) for dull brass, or 2s. 6d. each (post 6d.) for polished brass. These knuckle-jointed lid stays are 6 in. long when extended, and are available in right- (713R) or left-handed (713L) patterns. Dull brass are 714R and 714L respectively. An illustration of the stays is shown on the right.

Finish off the chest by glasspapering and filling the grain. Stain and polish or varnish according to individual capabilities. (M.h.)



MAKING DOUBLE EXPOSURES

ALTHOUGH our illustration shows a photograph of two boys, you may be surprised to learn that in actual fact they are both the same boy! This is an example of trick photography made by double exposure on the same negative, and once you know the mechanics you will be able to make all kinds of amusing pictures.

You may show your friends in two positions on the same print, or you may include yourself in the picture. The trick can be performed with any kind of camera, there is no awkward processing, no mirrors are involved, and all that is required is a simple accessory you can make to fit the camera.

The photograph shows that the two boys are on different sides of the picture, and this may give you a clue to the secret. We require some attachment which will divide the field of vision into two halves — you can make more divisions, of course, but this will be more complicated. This consists of some kind of enlarged lenshood or a box with two doors at the front, as shown in Fig. 2.

The camera is stood on a really firm support, so that it cannot move. A tripod is ideal, but failing this, you may

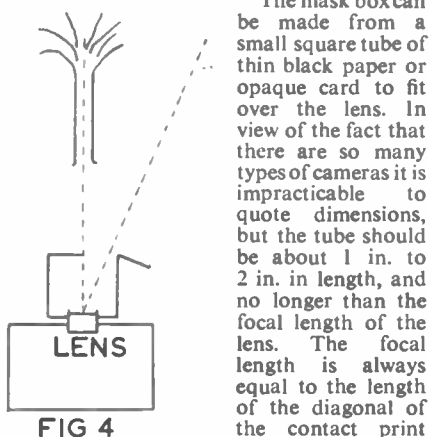
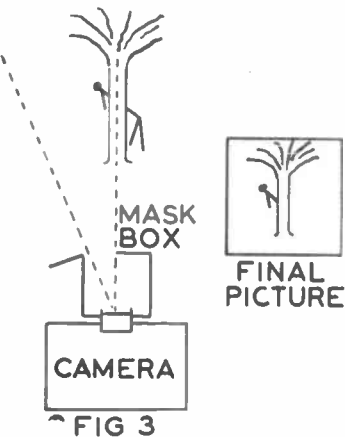
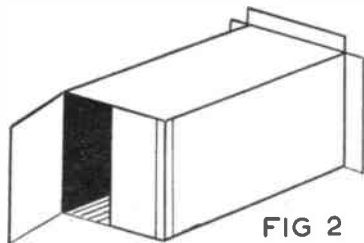


Fig. 1—
Not twins, but the same lad



use a suitable stool, and it will be best arranged so that you can divide the image into two halves, one on the left, and one on the right. One half of the mask box is covered, and an exposure made of the other half with the subject in position. We now cover the exposed half and open the other door, when a second exposure is made on the same film.

That is all there is to it, but it will be wiser to examine the operation in much more detail. When you look through the viewfinder of your camera you will see the image in a frame, and you must endeavour to establish some particular feature as the centre. Observe how much of the background can be seen, and position your subject in one half. It is sometimes helpful to test this by placing a piece of opaque paper over one half of the viewfinder before taking any pictures.

The mask box can be made from a small square tube of thin black paper or opaque card to fit over the lens. In view of the fact that there are so many types of cameras it is impracticable to quote dimensions, but the tube should be about 1 in. to 2 in. in length, and no longer than the focal length of the lens. The focal length is always equal to the length of the diagonal of the contact print

your camera produces. At the business end of the tube fit two doors, hinged by strips of black paper, so that no light can penetrate. The action of these doors is shown in Fig. 3, where the left door is open for the first exposure, and in Fig. 4, where we are making the second exposure. The panel in the centre of this diagram indicates the finished picture.

You can fit the mask box to the camera, temporarily, by means of Plasticine, Sellotape, or rubber bands over the tabs, but make sure that the doors open easily, yet will be reasonably firm during the exposures.

Remember that the two exposures must be identical in time, or the two halves will show different densities, while the camera must remain perfectly still, and in the same position for both, or the two halves will not match accurately — unless you propose making a really outrageous combination!

This trick of double exposure can be used for many amusing pictures provided you are careful in the initial setting. For example, you may take one half of your friend leaning out from behind a thin tree, as shown in Fig. 3, while the other half reveals that he has no body. This can be done by careful alignment of the tree and camera, and exposing as indicated. A similar example of this is shown in Fig. 1, where the two boys are apparently each holding an apple in the centre of the picture.

It is possible to produce some really amusing effects by using the same method for horizontal shots. An example of this is the placing of your friend's chopped-off head on the table, lining up this split with the table top.

Expose the lower half of the picture to show just the table legs, arranging for your subject to place his chin on the rear edge of the table top for the second shot. The head will then appear to have been chopped off.

You will appreciate that by these means we make horizontal splits, and if your friend stands on one side of the picture you will take the top half of the body. If the top door of the mask box is then lowered, and a second exposure made with your friend out of range, you will produce a body without legs. If he moves to the other side for the second

exposure, the body and legs will be separated! Alternatively, the first shot can be of the body in a frontal position, and if he then turns for the second shot his legs and feet will be facing the other way. Once again careful positioning is required for such shots.

Only one mask box is required for either the vertical or horizontal splits, and it is only a matter of how it is fixed to the camera. For that matter it can be attached to make diagonal splits. It is possible to make triple splits by making another mask box with three doors at the front.

TWO MINUTE

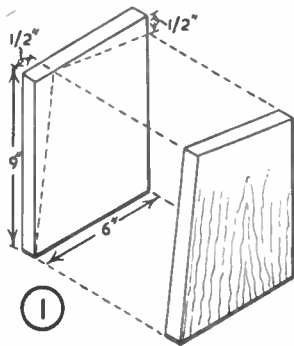
QUIZ

by Ed Capper

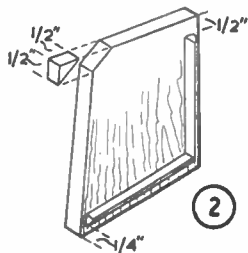
Answers on page 124

This Book Rack has No Joints

THIS rack will take but a few minutes to make, and will be suitable for holding six books. The use of beading eliminates necessity for any joint cutting.



1



2

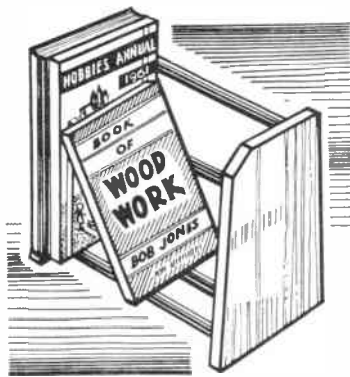


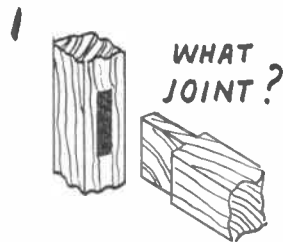
Fig. 1 shows a piece of blockboard 9 in. by 6 in., marked to allow for a $\frac{1}{2}$ in. splay at the front and at the top, as shown by the dotted lines. A wedged-shaped piece is cut from the top front of the ends, as shown in Fig. 2.

By A. R. Nison

Quarter round beading of $\frac{3}{8}$ in. size is then fixed by means of adhesive and panel pins, as shown in Fig. 2, to allow for a $\frac{1}{4}$ in. clearance at the bottom and the back. Terminate the beading $\frac{1}{2}$ in. from the top.

Half round beading of $\frac{1}{2}$ in. or $\frac{3}{4}$ in. size is then cut in lengths of 9 in., making sure that the ends are square. Five lengths of beading will be required. They are fixed to the ends with adhesive, as seen in the finished illustration. Panel pins can be used to provide extra security if thought necessary.

Apply fine glasspaper to the edges of the ends and the beading until smooth. Remove all dust, and apply french polish or a clear varnish.



2 IS PLUMBER'S SOLDER 1 PART TIN to 2 PARTS LEAD OR IS IT VICE VERSA?

3 NAME THE CRISS-CROSS SUPPORTS BETWEEN FLOOR JOISTS.

4 NAME THIS STONEMARK

5 NAME 1st TRIANGULAR BRICK ON ARCH

H.M.S. 'DREADNOUGHT'

Next week's free design will be for making a model of Britain's first nuclear submarine, the 'Dreadnought.' Make sure of your copy of 'Hobbies Weekly' by placing a firm order with your newsagent.

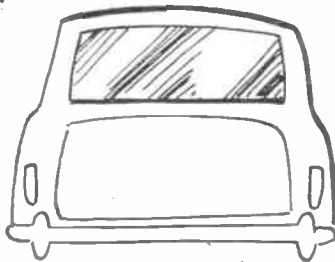
Toy Push-about MINI-CAR

"JUST LIKE THE REAL THING!"

SHOWING HOW MARKINGS ARE PAINTED ON VEHICLE

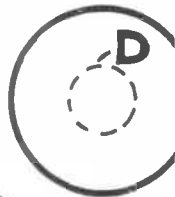


FRONT



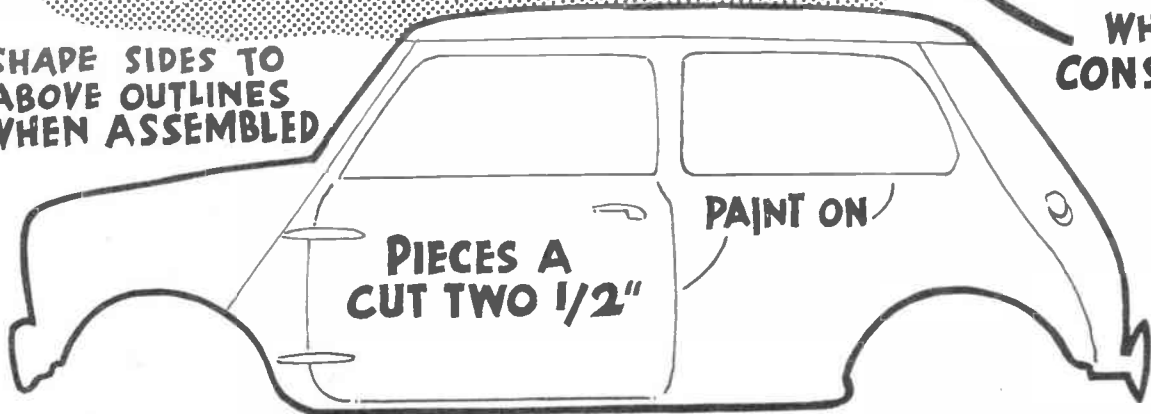
BACK

PIECES C. CI
FOUR 1/8"



WH
CONS

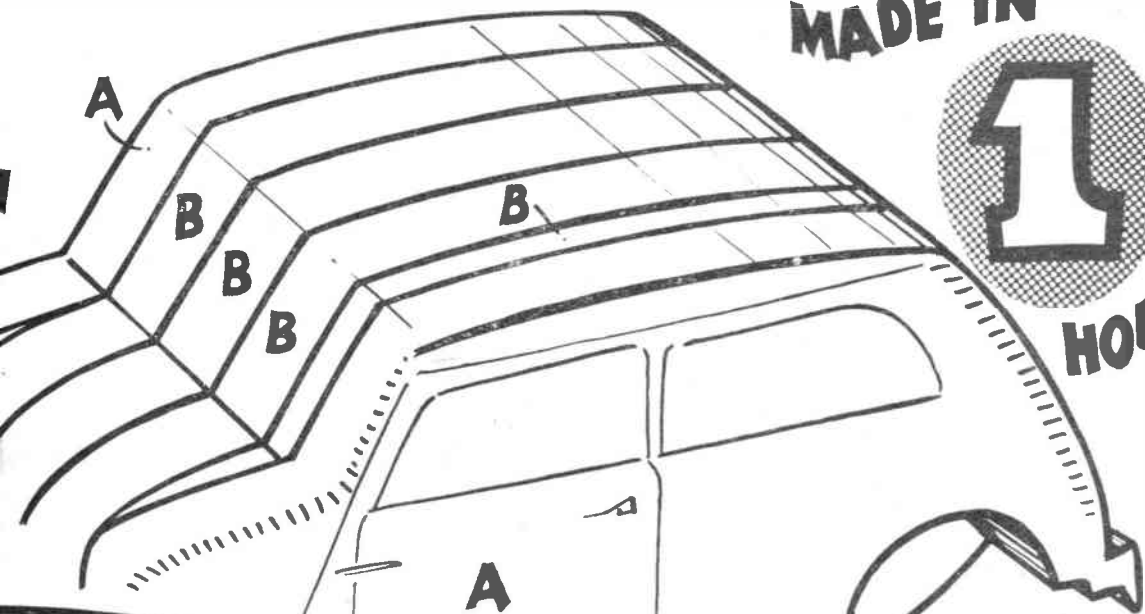
SHAPE SIDES TO ABOVE OUTLINES WHEN ASSEMBLED



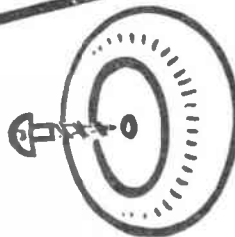
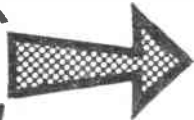
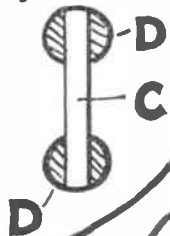
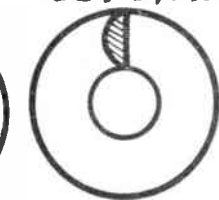
MADE IN

1

HOUR



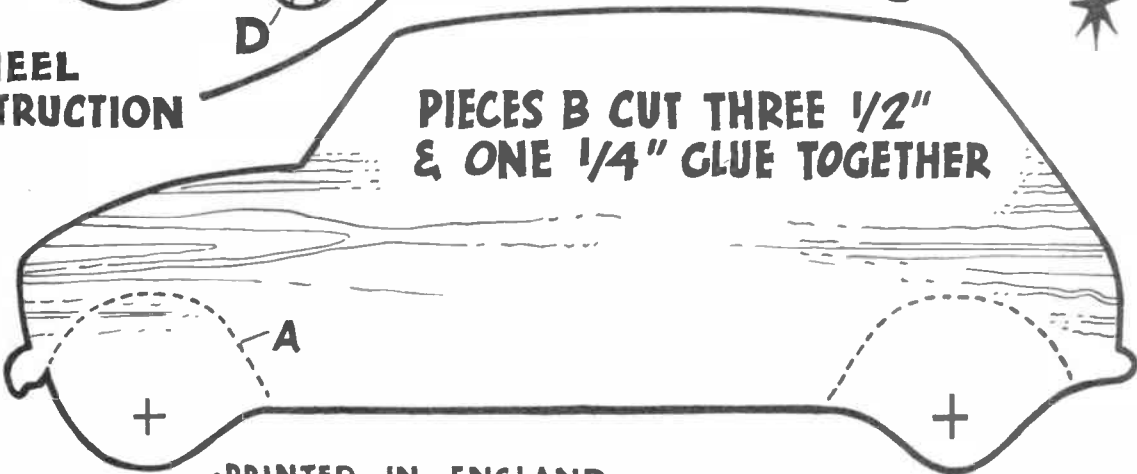
PIECES D CUT EIGHT 1/8"



PAINT WITH GAY COLOUR

FOLD INSTRUCTIONS

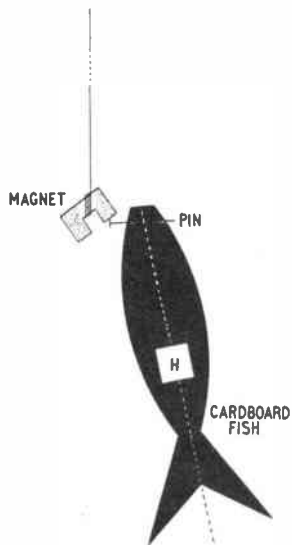
PIECES B CUT THREE 1/2" & ONE 1/4" GLUE TOGETHER



•PRINTED IN ENGLAND•

A 'Fishing for Words' Game

FOR many years an exciting indoor fishing game has given pleasure to young people. The well known game is in the form of a fish pond, or rectangular box decorated with underwater plants and animals and which contains a quantity of cardboard fishes fitted with steel pins. Several 'fishing rods' are supplied and these are made of dowel rods and strong thread and have magnets attached instead of hooks. The players of the game must try and catch as many fish as possible within a certain time limit. Fishes are hooked when the steel pins are attracted by the magnets. Each of the fishes has a number printed upon it. At the end of each 'round' the players add up the numbers represented by their catches.



This is an excellent game of chance, but it is possible to redesign the game and thereby to introduce an element of skill that will add to the interest and appeal. A large mixing bowl or shallow cardboard box will be needed to serve as a pond. If you use cardboard, the sides of the container may be painted pale green or blue and its appearance can be further enhanced by little coloured drawings of fishes, crabs, stones and water plants. Make a number of fishing rods by tying miniature magnets upon strong threads and attaching the threads to the ends of 18 in. lengths of $\frac{1}{4}$ in. diameter dowel rods. Paint the rods red or black, if you wish.

Next you must make about four dozen cardboard fishes. The fish shapes are

easily cut out if you begin by folding the cardboard in two, and then use sharp scissors to cut out half the body shape on the side of the centre fold. Keep your shapes simple. Heads, broad bodies, narrow 'waists' and single pairs of spreading tail fins will be sufficient. Let no fish be more than 3 in. long, but vary

By A. E. Ward

the shapes to add variety. Thin cardboard pieces, coloured red, blue, and yellow will be ideal. Also, cut out a single larger, broader fish out of black cardboard. Cut out letters of the alphabet from magazine article and story titles and glue a single letter upon the tail of each fish. Don't forget to provide plenty of vowels. The black fish will be left blank.

Provide each fish with a 1 in. long steel pin. Be careful not to use pins of the unmagnetic variety. Press the pins in and out of the cardboard near the fishes' heads. The game is easy to play. Stand the pond upon a stool, or heap of books, placed on the table in such a position

that it is impossible for players seated at the table to see the bottom of the pond.

Throw in all the fish and jumble them up. At a given signal all the players must commence fishing. Try and avoid tangling lines or attracting your neighbour's magnet. The fishing will cease when somebody 'hooks' the large black fish. Now every player must count the number of fishes he has caught, then he must try and arrange the lettered fishes to form one or more words of at least three letters each.

Every fish employed to make a word will add another point to a player's score. Thus, if a player catches nine fishes (e.g. fishes carrying the letters K, F, S, T, Y, X, S, O, and E) he will score nine points for a start. Now, the player may arrange eight of his fishes to form the words: SKY and FOXES. As a consequence of his skill at word making he will score a further eight points, to obtain a total of seventeen points. The winner of the game will be the player who scores the greatest number of points after a certain number of rounds. Rounds will be brief in duration when the black fish is hauled up quickly, but sometimes the black fish will be elusive and cause much excitement. This game is most fun when the number of players is small.



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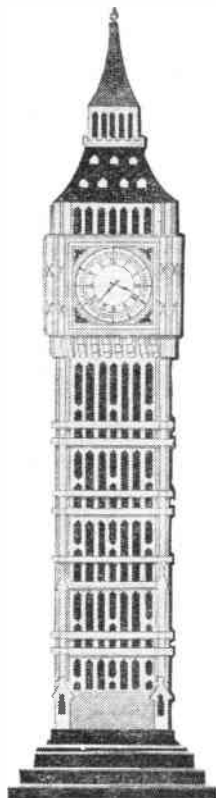
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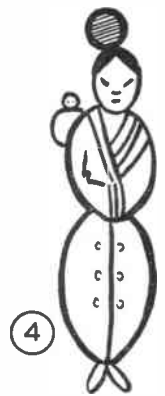
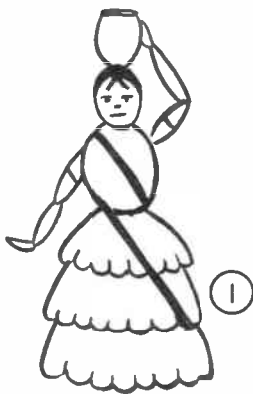
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SHE sells sea shells on the sea shore.' You may not be able to say that very quickly but there is no limit to the lovely things you can make with shells picked up from the sea shore.

Making little dolls and nick-nacks from shells is a most entertaining hobby. It costs practically nothing, and requires just a little patience and a light hand.

If you find any difficulty in sticking the shells together, you might find it helpful to use a thin file to flatten the edges slightly as this makes them stick together more easily.

This is the preliminary part of the operation. At this stage, the doll is just a collection of shells and looks very little like the finished character of a

You might prefer to drill a very tiny hole in the side of the shell you are using for the face and pass the wire through. This is entirely up to you. You are free to adapt these designs to the kind of shells you have and the patience you possess.

For the garland, the one in the diagram was made of minute shells brightly painted. A hole was drilled through them

An International Dolls Parade —with Shells

By
Meena Nadkarni

The four dolls shown can be the beginning of a wide collection of international dolls. When you see how easy it is, you will get ideas for many other national characters.

You need only a few things to begin with. Shells, of course, are absolutely necessary, and it would be nice to build up a stockpile of all possible types. Many break while being worked on, and it is not easy to find pairs, so get a good collection of all kinds.

Oil colours and turpentine, a good adhesive like Durofix, some copper wire and wool are the only other materials required, and will cost a few shillings.

As you will see from the sketches, the shapes of the shells needed for each doll are pretty obvious. The variety is brought about with a little paint and imagination.

Now to make an actual doll, such as No. 1, from India. Take three ordinary fan-shaped shells. Build them up one above the other by sticking a small shell or cotton wool between them in such a way that it cannot be seen but only adds height to the shells.

These three form the lower part of the sari. The upper part of the body, the face and the arms are made up of shells stuck to the others and each other with strong adhesive. You will have to go through your pile of shells and choose the ones most suitable for the different parts of the body.

definite country. It is now that paint and your skill play their part. However, before you begin painting, it is wise to leave the doll for a few days so that the adhesive can do its work properly. If you hurry at this stage, the shells might come unstuck and cause annoyance.

Mix the oil colours with the turpentine till it is fairly thick in consistency. You will need about two to three coats of paint altogether. Use bright, contrasting colours. The hair, the eyes, nose, and mouth should be painted in carefully.

Now for the differences in the other dolls. Numbers 2 and 3 have thin legs showing below their dresses and so are more difficult to make than the ones which use larger shells at the base.

You will find that a twig stuck to the back of the shell may help. If, however, your patience is limited and you still have difficulty, a little plastic bowl from a child's toy collection will do. Invert it and let the doll you are making use its support so that the weight is off the tiny shells used for the legs. You can paint it later to look like a stool or the trunk of a tree.

For Doll No. 2, The Hula-Hula Dancer, use thin wire bent to the shape of round ear-rings and stick them on.

with a pin, and then they were strung together on a chain. You might prefer to use tiny paper or plastic flowers. The grass skirt can be made from cut hay or straw. You will find it easier to stick the hay around a thin tape which is then tied at the back.

The clothes of Doll No. 3, The Dutch Girl, may look complicated but the main body consists of three shells with the clothes painted on in the colours of your choice. The pigtails are made of wool and stuck to the back of the shell making up the face.

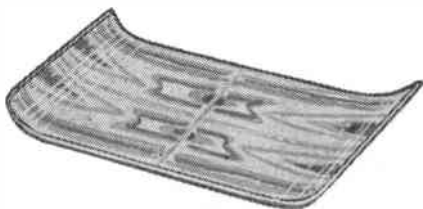
For the Japanese Doll (No. 4), the main body is made up of two shells and the clothes again painted on. On her back is her baby in a basket, made up of two shells. Her bun is made of another shell stuck on the top of her face.

You probably will have so much fun making these dolls that you may be tempted to take on a United Nations of international dolls — all with shells.

ANSWERS TO QUIZ (see page 119)

1. Mortise and Tenon Joint.
2. One part tin to two parts lead.
3. Herringbone strutting.
4. Long and short work.
5. Voussoir.

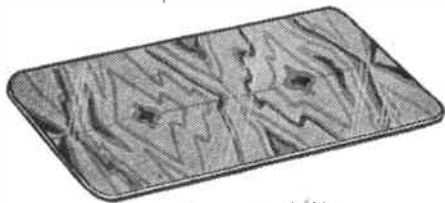
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Make a Set of 'Napier's Bones'

NAPIER'S Bones are quite easy to make and use, and a lot of fun can be had with them doing various hard multiplication sums. The bones were invented by John Napier, and are, in effect, a form of simple calculating machine.

The bones and the back-board, or frame, can be made from stout cardboard, or they may be made from thinner card, and the whole lot mounted on suitable pieces of thin plywood.

board 5 in. by 5 in., with a $\frac{1}{2}$ in. wide cardboard 'L' glued to it on the left hand and bottom edges. The left hand side of the 'L' is divided into $\frac{1}{2}$ in. squares and, starting from the top, these are numbered from one to nine.

The bones are easy to use. To multiply a pair of numbers together the figures for one of them are selected from the bones and placed in the frame, so that the number required is read at the top.

The second number is brought into use by selecting in order on the side of

the frame the figures that go to make that number.

Let us suppose that it is required to multiply the number 4265 by 926. The bones numbered 4, 2, 6, and 5 would be selected, and placed in the frame in that order.

The second number is selected, digit by digit, from the figures on the left hand side of the frame. When each figure is selected the figures in line with it across the bones are added diagonally and written down. Note how the first

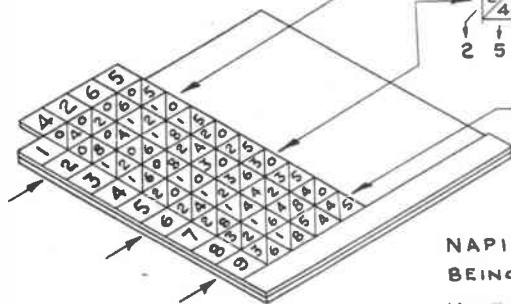
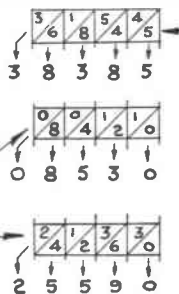
By S. Martin

To make the bones, take nine strips of stout white cardboard, $\frac{1}{2}$ in. wide, 5 in. long, and divide them into $\frac{1}{2}$ in. squares. Number each one of the strips 1, 2, 3, etc., in the top square of the strip. Draw in the diagonals for all the rest of the squares on each of the individual strips, or bones, drawing the diagonal from the top right to the bottom left corner of each of the squares.

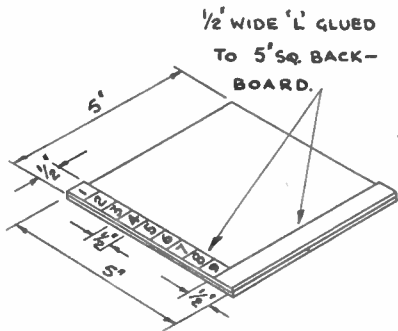
On each square is then written the product of the number at the top of the strip, and the numbers from 1 to 9. For example, in the case of the rod numbered 3, the multiples from 1 to 9 would be 03, 06, 09, 12, 15, 18, 21, 24, and 27. The first figure of each answer is written in the top triangle formed by the diagonal, and the second figure in the bottom one. A glance at the illustration will make this point clear.

The frame is simply a piece of card-

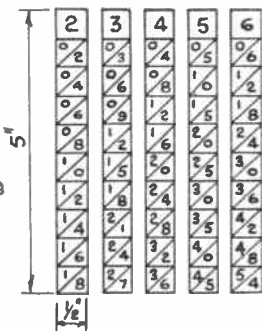
Row 9	3 8 3 8 5
Row 2	0 8 5 3 0
Row 6	2 5 5 9 0
ANSWER	3, 9 4 9, 3 9 0



**NAPIER'S BONES
BEING USED TO
MULTIPLY 4265
BY 926.**



**DETAIL OF FRAME.
MAKE FROM CARD
OR PLY.**



**PART OF A SET OF
BONES. BONES, OR
RODS FOR NOS. 2 TO 6**

row (row 9) is arrived at. Starting from the right-hand side; first figure is 5; second is $4+4=8$; third is $8+5=13$ (put down 3, and carry 1 to next column); fourth is $6+1=7$ (plus 1 from last column) = 8; last column = 3. Thus we get the result 38385.

The additions across the bones of all the digits selected are noted, not forgetting to move each row over one space as it is set down.

These completed rows are then added together, and the answer gives the product of the two numbers. An example is worked out in the illustration.

If it is desired to increase the scope of the calculator the number of rods, or bones can be doubled or trebled, and hence larger numbers can be manipulated.

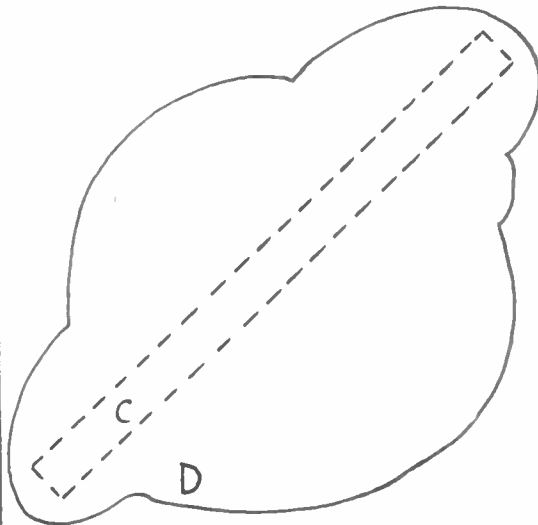
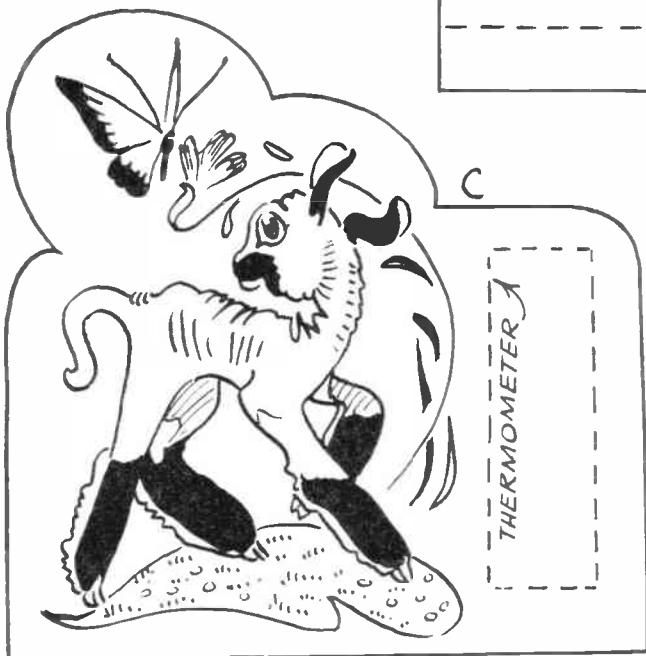
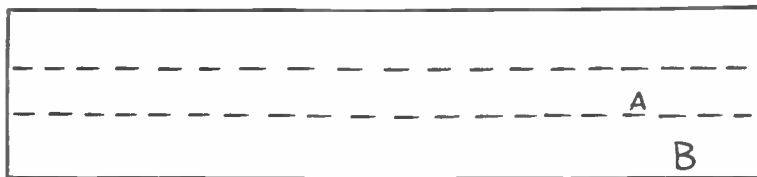
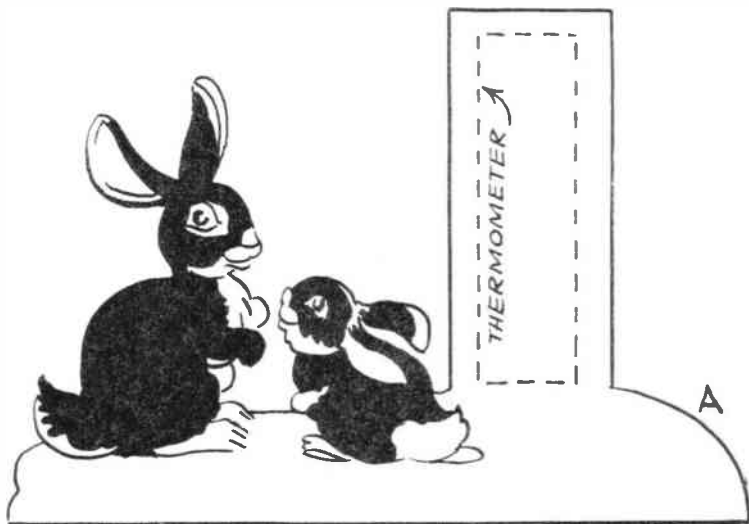
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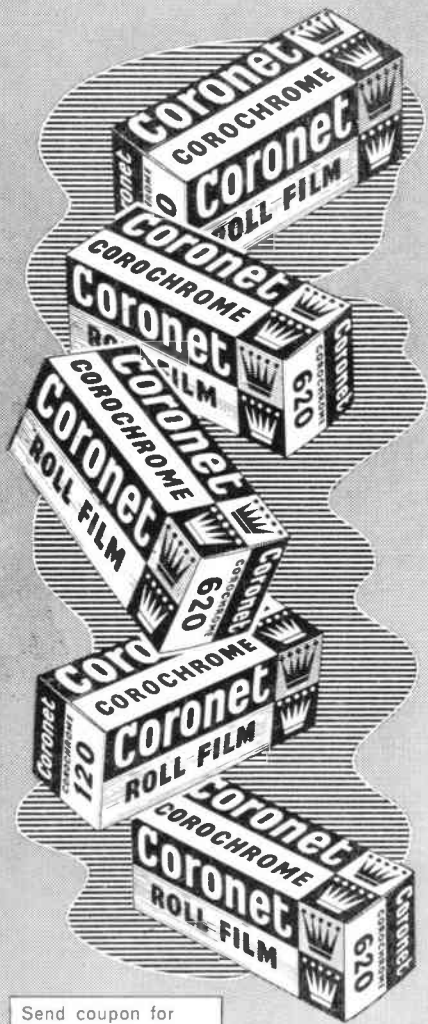
GIFT PROJECTS FOR FRETWORKERS

SMALL transfers from Decorette sheet No. 226 (price 2s. 3d. per sheet of six designs) are the basis of these attractive novelties. You simply 'slide off' the transfers on to a piece of $\frac{1}{4}$ in. fretwood, and mark out the background, leaving enough room for the small thermometer. In A you cut close to the animals with the fretsaw, but in C it is necessary to leave an overall background. Bases B or D are simply glued in position.

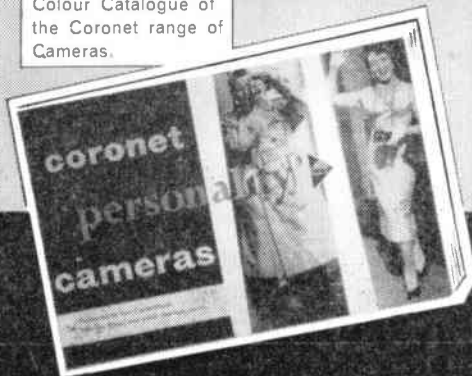
The transfers are beautifully coloured and look delightful when used in this way. The thermometer, No. 5016, costs only 1s. 6d. Both transfer and thermometer may be obtained by post from Hobbies Ltd. Dereham, Norfolk, or from any Hobbies branch. Remember to include 7 $\frac{1}{2}$ d. postage if ordering by mail.

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