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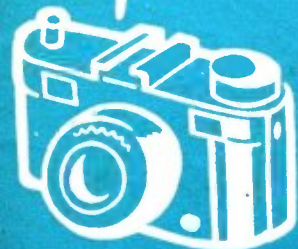
make this sturdy

rocking horse



details inside
for making this

... Grand Old Favourite



FOR CRAFTSMEN OF ALL AGES

6^p

A FLIP-A-DISC GAMES BOARD

A TIDDLYWINK is made to jump about in an amusing manner by remote control action on a specially-constructed playboard which is easily adapted for a variety of miniature games of skill.

The main illustration shows two novel games being played — 'Lawn Tennis' and 'Horse Jumping' — and details of the components needed for both games will be described.

Two panels of $\frac{3}{8}$ in. plywood are required; one measuring 12 in. square — with the corners rounded A, the other 9 in. square from which is cut away the middle portion to form the frame with $\frac{3}{4}$ in. sides as in B, Fig. 1.

Glue the ply frame centrally to the base. Another frame with $\frac{3}{4}$ in. wide sides is cut from white or coloured (flexible) card, C. Punch a small hole at each corner of the frame.

Two flat wooden ice-lolly sticks, with rounded ends, are cut into halves and these are glued to the frame — one to each side — for the 'flicker-sticks' D.

Cut a piece of transparent, flexible, acetate sheet, 9 in. square and glue it by the edges to the card frame, (opposite side to the sticks). Lay the frame over the other plywood frame as in the plan (Fig. 1.)

Loop a small rubber band through each corner hole, and fasten them to drawing pins pushed into the frame B, as shown.

Put a tiddlywink or other light disc on the acetate panel, and flick one of the sticks (with the finger *under* the stick) to flip the tiddlywink into the air. The tiddlywink is also moved along the smooth surface in the required direction by

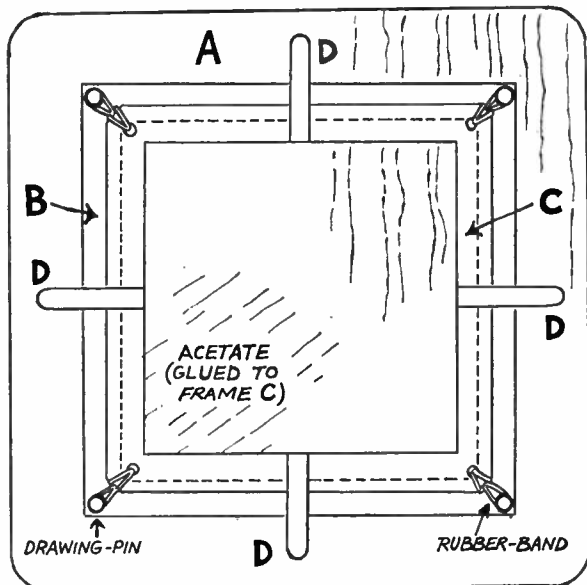
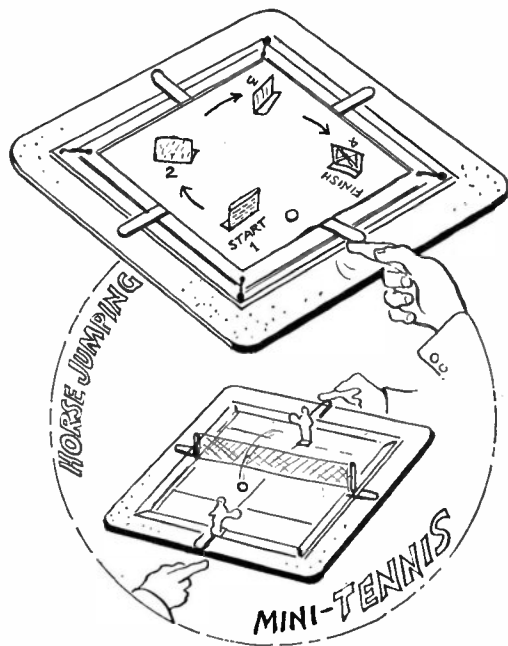


Fig. 1. Layout of the playing board



flicking the appropriate stick *sideways*. These upwards and sideways movements are used to good effect in the suggested games.

For the Horse Gymkhana four pieces of light card are cut for the obstacles E, as in Fig. 2. Bend up the base as shown and draw in the hedge, brick wall or fence details. Heights of the jumps may be varied by trimming with scissors.

Positions of the jumps are shown in the main illustration, and they are stuck to the acetate panel with pieces of clear adhesive tape (or glue if they are not to be removed for other games). Directional arrows and 'start' and 'finish'

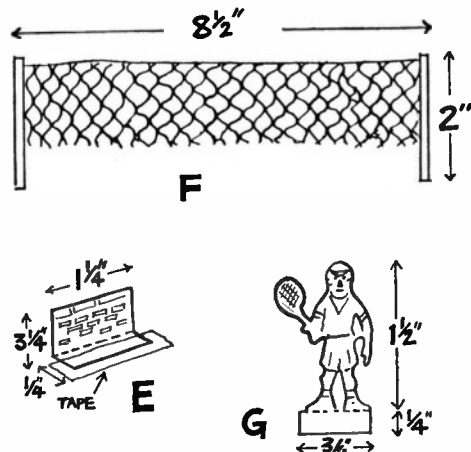


Fig. 2. Components for the game

indications are drawn on a piece of paper or thin card and fitted in the frame so that it shows through the transparent panel.

The tiddlywink is directed around the 'field' and over the jumps, and points are lost for failing to get over a jump at the third attempt. The first competitor to get a clear round is the 'champion'.

Fig. 2 also gives details of a net and tennis-player figures for the Lawn Tennis game. The net can be cut from the plastic mesh bag in which you buy oranges or carrots F. It is held at both ends by round-rod posts, these being inserted in holes drilled in the plywood frame B.

The little tennis players are cut from thin card and stuck to the panel — again using cellulose tape G. Two players take part, shooting the tiddlywink 'tennis ball' over the net by flicking the sticks at opposite ends. Use the rules of real tennis in the methods of scoring.

Little rings of light wire or card can be used, in place of tiddlywinks, for games of Hoopla, a piece of round rod being fixed in the middle of the game on which to hook the rings.

Other components, such as goal nets, are easily made up for mini-soccer or ice-hockey games. Prepare suitable base cards for inserting under the frame for the different games.

PICTURES WITH A DIFFERENCE

By S. Martin

READERS of *Hobbies Weekly* who have a taste for the contemporary should obtain a great deal of satisfaction from making pictures based on the ideas described here. And, although the designs seem to consist of fascinating curves, this appearance is completely illusory. The motifs are, in fact, composed entirely of straight lines!

Before starting on a finished picture however, practise a few basic sketches on a piece of scrap paper. Begin by drawing two lines at right angles, each 6 in. long and divided into $\frac{1}{2}$ in. portions. Number these divisions 1 to 13 on each arm, making 1 the common point where the two arms meet. Then, starting at point 13 at the extremity of one of the arms, join it up to point 2 on the other arm. Continue by joining 12 and 3, 11 and 4, 10 and 5 and so on until the figure is completed.

By now you should be getting the idea so try a few variations. Still keeping the arms at right angles, try the effect of making the vertical arm twice as long as the horizontal one. You will always need the same number of points on each arm so this time the long arm will have to be divided into 1 in. sections.

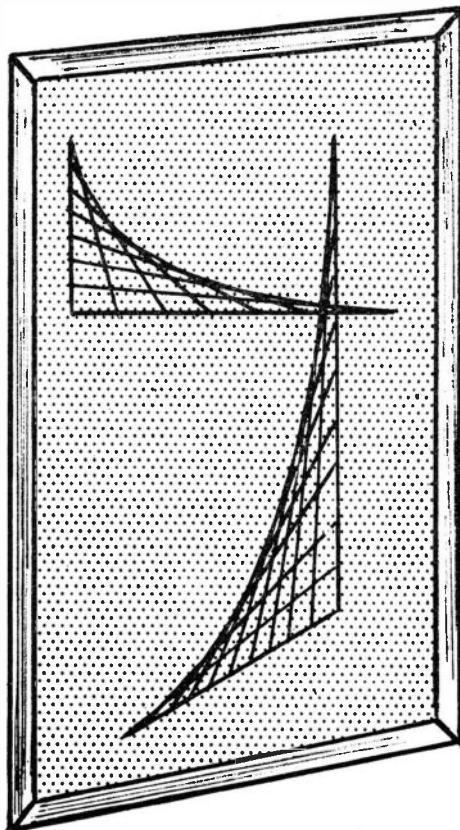
After this try varying the angles between the arms themselves, making them less than 90° and then considerably more, at the same time varying the lengths of the dividing units.

By now you will see what can be done with a few subtle changes and now is the time to start making a simple picture.

Take a sheet of stiff white card and mark your chosen design on it lightly in pencil. Attractive patterns may be made by combining several designs in one picture.

Next go over your pencil work with coloured ball-point pens, using, say, red and black to draw each of two patterns on one sheet. And this time of course you will have to leave the numbers off your drawing. However, once you have drawn a few for practice it should soon become easy to construct your patterns without this guidance.

When you see how attractive your finished work is you can, if you wish, make simple frames for your best efforts.



This can be done quite simply by mounting the white card (using a suitable adhesive) on a piece of hardboard of the same size. This can then have a simple surrounding frame added by using standard picture frame section which can be obtained from Hobbies. For pictures of this nature it will be quite suitable to glue the frame in position, screwing a couple of eyes into the back of the hardboard to take a light cord for hanging.

As an alternative your picture could also be finished off by covering the card with a sheet of glass and then finishing the edges with passe-partout, either in black or in one of the many attractive colours available.

Yet another variation may be made by using a black card as the background, outlining the designs themselves in coloured sewing silks:

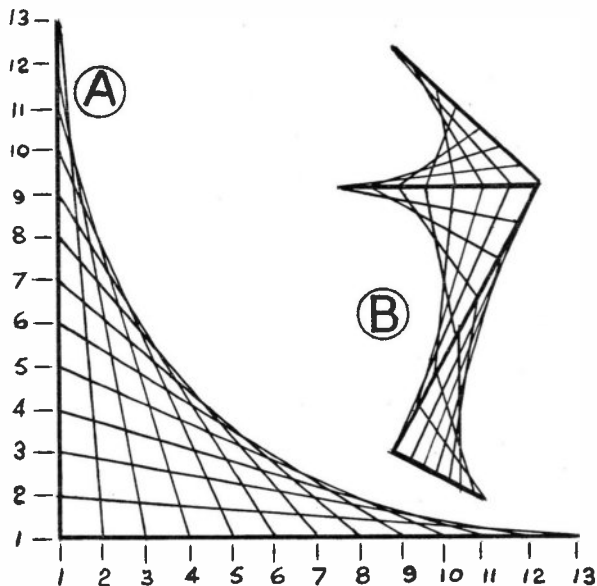
Once again the design is sketched lightly on the card and as it will be a little more difficult to see it on the black it is a good idea to use a fairly hard pencil. When all the drawing is done the patterns have to be sewn and the use of silks gives you a much wider range of colours than you can get by using a coloured ball-point. The black card also forms a background which sets the silks off to perfection.

When using the silks you join the points up virtually in the same way as you do with a pen, your 'lines' being the silks themselves. Let us take a look at our basic figure again and see exactly how this would work.

Starting at point 13 you would tie a knot in your silk and, bringing it up through this point, take it across to point 2 on the opposite arm. You would then take your needle through to the back of the card where you can now cross back to point 12 (next to your starting point) ready for a new 'line' across to point 3.

This sequence should continue until the design is completed, when the picture can then be finished as before by sticking the card to a piece of hardboard and then adding a simple frame.

For those readers who like to experiment, try the effect of enclosing your designs within a figure such as a square or a triangle. And for a really intriguing and unusual result try using a circle as the enclosing figure, having first divided its circumference into a number of equal divisions. Join points 1 and 2, 2 and 4, 3 and 6, 4 and 8, making each line finish two points ahead of the previous one and continue round the circle in this manner until the design appears.



A. Basic figure, B. Variations of basic figure may be drawn with a common axis.



SE-TENANT

By L. P. V. Veale

SE-TENANT is the French term for 'joined together.' It is used to denote a pair of stamps, one of which is different from the other in some way; it may be a matter of value, inscription or overprint.

We do not have to go very far to see an example of the difference in value. During the summer of 1963 a holiday booklet of stamps was brought out. This was prepared expressly for people on holiday who normally send a number of postcards using 2½d. stamps, so the booklet contained nine 2½d. stamps and, to make up the 2s. od. they had to add three ½d. stamps. In a 2s. od. booklet there are four stamps to a page, and nine 2½d. stamps meant two pages and one stamp over; this was put among the ½d. stamps. So we had a page with a 2½d. stamp attached to a ½d. stamp; that is, they

were se-tenant. All collectors should try to obtain a specimen of the two joined together.

For an example of the inscription we have to turn to the stamps of South Africa. Among these you will find two stamps of exactly the same design joined together; one of them having the name in English, and the other in Afrikaans — 'Suid Afrika'. The last time that a pair of stamps was issued was in 1955 for The Voortrekker Covenant Celebration at Pietermaritzburg. Since then, the name of the country has been written in both languages on each stamp.

Now for the case of the overprint. In 1916 the King George V halfpenny stamp was overprinted 'Levant' for use in Salonica. Naturally a whole sheet of stamps would be so overprinted, but by mistake one stamp did not receive the name, and consequently that would appear to be just the ordinary British halfpenny stamp and its value would be practically nothing. But if anyone purchased two stamps, one with the overprint and the next one without, PROVIDED they are not separated, then the pair would be catalogued at £25. If they had both gone through the post together then they would be worth a little more, about £30, but the value depends on the pair being se-tenant. If you want an even better example take the case of the Royal Silver Wedding stamp overprinted 'Tangier'. Again in one instance on the sheet the word Tangier was omitted, and if you had this se-tenant with the overprint then the pair would be valued at £135.

Now look at the first illustration. This was issued in 1924 to commemorate the 300th anniversary of the Danish Post. The two kings shown are King Christian IV and King Christian X who were on the throne when the post commenced and for the 300th anniversary respectively. Obviously

the curious thing about this block is that in each line the portraits look inwards though the kings have been transposed. So that you could have quite a number of se-tenant pairs if you take them both horizontally as well as vertically, and the specialist will often spend a very long time working out the various ways in which these stamps may be obtained. Sufficient for most people is the acquisition of a block of four, or failing that two pairs.

A similar block to this was the Canadian Outdoor Recreation series issued in 1957 when designs illustrating fishing, swimming, hunting and ski-ing were printed together in sheets of 50. The first, second, fourth and fifth rows were printed so as to give se-tenant blocks while the central row was made so as to give two vertical strips of four (one of each design) plus two odd ones.

Now the United States of America has given us a Christmas block of four showing holly, mistletoe, poinsettia, and pine cone so here again you can have a selection of pairs.

Rather a striking example is the pair illustrated which comes from Dutch Indies, issued in 1939 at Christmas as a charity stamp in aid of the Dutch Indies Social Bureau and Protestant Church Funds. Although no premium is shown on the stamp, the price was 10c plus 2½c for charity and the design shows the European nurse tending a white patient and a native nurse also tending a patient, the effectiveness of these designs being of course the fact that the grouping of both nurses and patients is the same.

Hungary has had quite a number of se-tenant issues. In 1960, in connection with the Stamp Exhibition at Budapest, a stamp was issued with a pictorial label attached which served as the entrance ticket to the exhibition. And in 1958, also for the same function, there were two stamps and a label in the form of a triptych; that is, the two stamps were separated from one another by the label. The important thing is to collect the three items attached to one another.

East Germany, on the first anniversary of the death of J. R. Becher, issued a stamp in sheets with alternate rows of labels bearing a part of the East German national anthem and Becher's signature. In 1962 for the World Youth Festival Games at Helsinki she issued a block of four and a pair; while in 1963 she used se-tenant stamps to commemorate the second team manned space flight showing portraits of V. Tereshkova and V. Bykovsky. So there are plenty of se-tenant stamps from which to obtain specimens for your collection.

Now what is the point of issuing these se-tenant stamps? For instance, two stamps of different postal values — why join them together? This question is quickly answered by



the British 2½d. and ½d. se-tenant, which have come from the booklets. These were produced for the benefit of the public.

Se-tenant stamps provide an easy way of commemorating two episodes or events which occur simultaneously, or of associating two persons or things with one event, such as that of Denmark when they showed the portraits of the respective kings. These combinations of stamps also relieve the designer of deciding the most important person, place or thing. They just illustrate them all, as in the case of the U.S.A. with its holly, mistletoe, etc.

Lastly what about enhancing sales? If stamps are being sold in pairs, many people would buy two even if they only needed one at the moment. But most certainly stamp collectors will want both stamps of a pair, or even all four if it is in a block. So you see there are quite a number of reasons to account for these formations.

Miscellaneous Advertisements

UNDER 21? Penfriends anywhere — details free. Teenage Club, Falcon House, Burnley.

PENFRIENDS home and abroad, all ages. S.a.e. for details. — European Friendship Society, Burnley, Lancs.

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HOLDER FOR A POWER DRILL

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

With the drill holder shown there is no risk of such a mishap. The holder is made entirely of timber and holds the power drill snugly even when fitted with any size of twist drill up to $\frac{1}{2}$ in. diameter. It also holds the chuck key, the electric

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

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

Two pieces of 9 mm. plywood $6\frac{1}{2}$ in. by $4\frac{1}{2}$ in., with the corners cut as shown, are used for the top and bottom. In the top piece a hole is cut with a fretsaw to take the body of the drill. To mark out this shape for cutting, unscrew the three screws clamping the front to the body of the drill, and use the truncated drill as a template. Alternatively, a piece of pliable wire can be bent around the drill to get the shape.

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

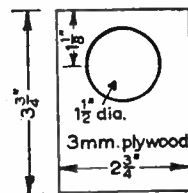
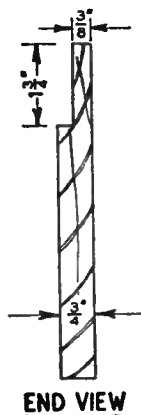
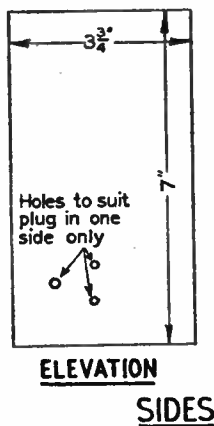
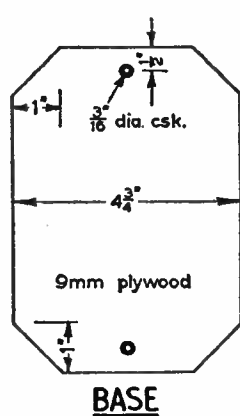
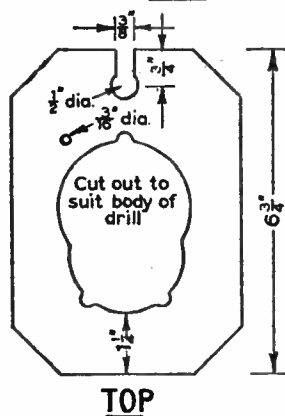
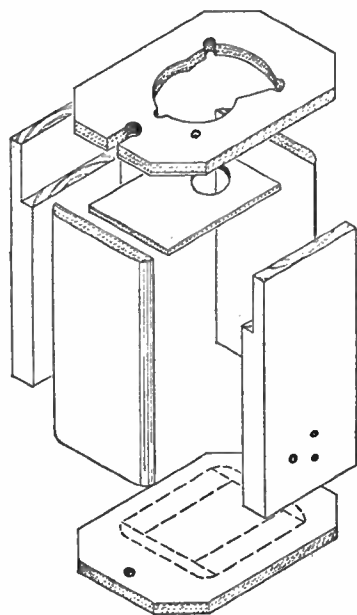
In the bottom piece two $\frac{3}{16}$ in. holes are drilled and countersunk. These are to take the screws for fixing the holder on to a bench top or horizontally on to a wall. A $3\frac{3}{4}$ in. by $2\frac{3}{4}$ in. platform of 3 mm. plywood is drilled $1\frac{1}{2}$ in. diameter to suit the collar of the drill. The tops of the 7 in. by $3\frac{1}{2}$ in. by $\frac{3}{4}$ in. timber sides are sawn down as shown to provide a seating on which to glue and nail the plywood platform. The front and back are of 9 mm. ply, size 7 in. by $3\frac{1}{2}$ in. All parts are glued and nailed together.

With the drill in position in the holder, coil the flex around the body of the holder, mark the positions of the plug

MATERIALS REQUIRED
 Two $6\frac{1}{2}$ in. by $4\frac{1}{2}$ in. by 9 mm. plywood.
 Two 7 in. by $3\frac{1}{2}$ in. by 9 mm. plywood.
 One $3\frac{1}{2}$ in. by $2\frac{3}{4}$ in. by 3 mm. plywood.
 Two 7 in. by $3\frac{1}{2}$ in. by $\frac{3}{4}$ in. timber.
 Glue and nails.

pins, and drill holes to correspond to their size and spacing.

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



PRACTICAL DESIGNS FOR WOOD TURNING

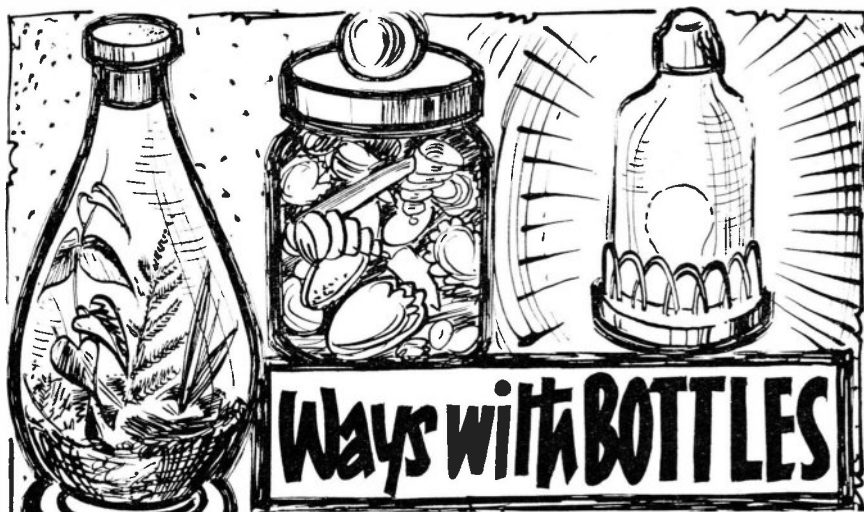
By Roland Seals

THE chief difficulty facing the man who has acquired a lathe is that of designs. He turns such obvious things as bowls and candlesticks, and then wonders what he can turn to next. This book supplies the answer.

It includes designs for table lamps, clock, and barometer cases, bowls and dishes, vases and jars, boxes, biscuit barrels, table accessories, kitchen items, etc.

There are over seventy plates of designs and working details, and every man with a lathe will find this book invaluable.

Published by Evans Brothers Ltd. Montague House, Russell Square, London, W.C.1. Price 16s. 0d.



You can make
INDOOR
GARDENS
NOVELTY
LAMPS
PAPER-
WEIGHTS

Says A. Liston

TAKE another look at that empty bottle before you throw it out. Bottles of various shapes and sizes can be used in a number of ways to create attractive touches round the house.

The old-fashioned apothecary's bottle for example, filled with coloured liquid, was once a decorative feature of every chemist's window. Today it is a fashionable, but expensive, decoration for the house. A cheaper version uses an empty bottle in one of the attractive shapes found nowadays, filled with water tinted with coloured ink and given a decorative stopper.

The same large variety of bottle can be used to make a sealed indoor garden. A layer of charcoal is sprinkled at the bottom of the bottle, the soil added, and suitable indoor plants, preferably slow-growing lovers of moist conditions, are planted. A cane, notched at the end, is useful for planting. Enough water to moisten the soil is added, and the stopper is fixed firmly in place.

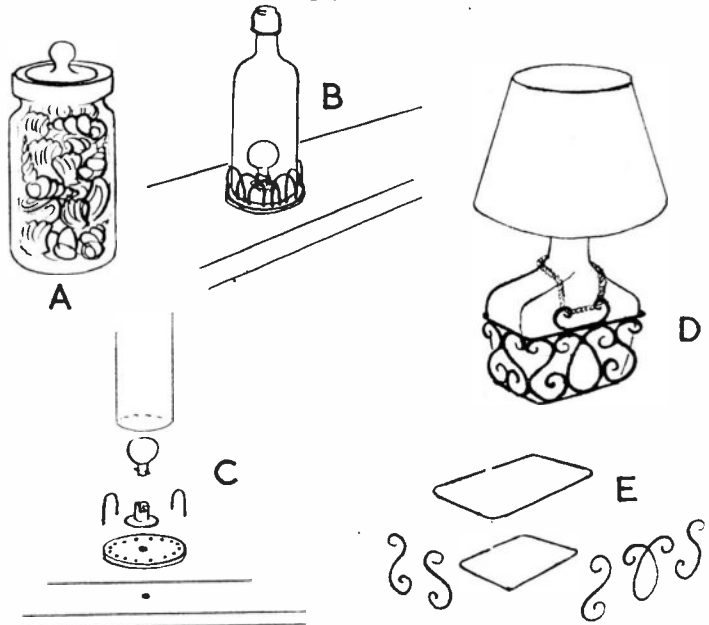
Small sweet bottles — sealed down versions of the large confectioner's jars — make unusual ornaments or desk paper-weights with their attractive chunky shapes A. They can be filled with coloured pebbles, pine cones, or sea-shells scrubbed clean. This is one uncommon way of displaying souvenirs brought back from a holiday or an outing.

An empty bottle, such as a wine bottle, especially one with a slightly green tint, makes an attractive lamp for a bookshelf or a cocktail counter top B. First, the bottom is removed from the chosen bottle, either at home or by a glazier, and a suitable base can be made as shown at C. This is made from a plywood disc, $\frac{3}{4}$ in. greater in diameter than the bottle. It is drilled round the

edges to take the loops of cane which form a decorative ring. These loops are glued in place, and a small lamp-holder, known as the S.B.C. type, is screwed to the disc. The base is screwed to the shelf, which should be drilled to take the flex, and a round white 15 watt bulb is fitted. The bottle, which should be a close fit inside the cane ring, is then slipped in place.

While there are various types of adaptors available for converting empty bottles into table lamps, this useful idea can be carried further by decorating the bottle with a simulated wrought-iron basket. D. A bottle of suitable shape,

which must be thoroughly dry inside, is painted on the inside by running some paint into it, draining off the surplus, and leaving it to dry. Lampshade frame wire is used to make the basket as shown at E. An upper and lower ring to fit the shape of the bottle, with scrolls to fill in the area between them, is one of the most effective designs. The basket is soldered together, washed thoroughly in hot soapy water, dried and painted black. The basket is secured in place by a silk cord passed through the wire, over the shoulders of the bottle, and tied at the back.



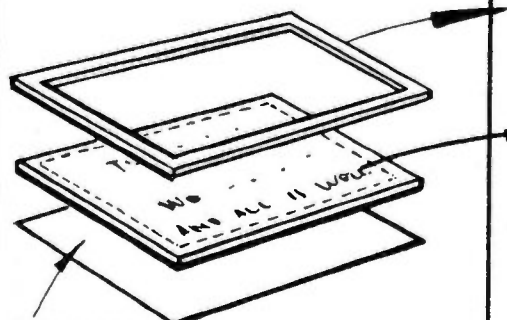
HOBBIES

MINI - DESIGN

**FRET CUT
WALL PLAQUE**

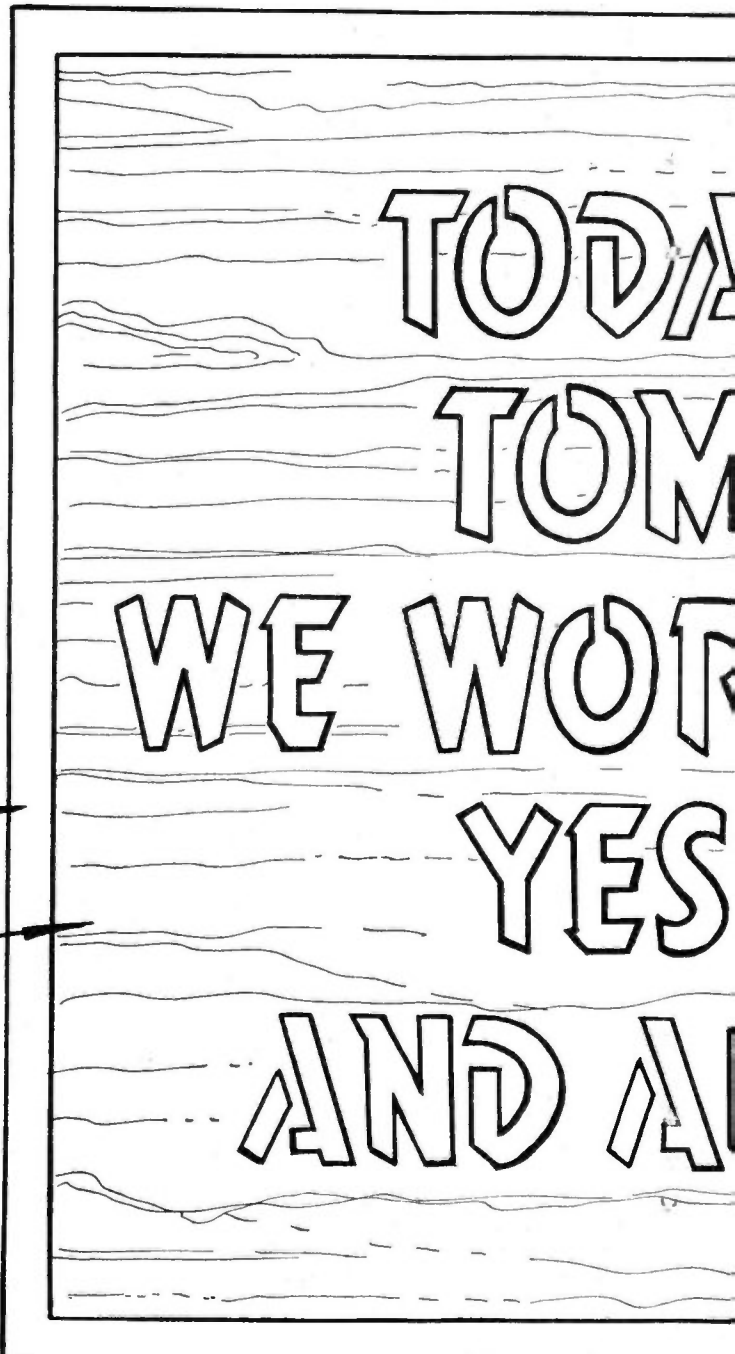
FOR CLUB OR DEN

**ALL YOU NEED IS
A HOBBIES FRETSAW
A STEADY HAND
AND PATIENCE**



**COLOURED
PAPER GLUED
ON BACK**

**WALL HANGERS
PINNED ON**



1/4" W

DAY IS THE
MORROW
WORRIED ABOUT
ESTERDAY ...
ALL IS WELL

1/4" WOOD THRO' OUT.

A GRAND ROCKING HORSE

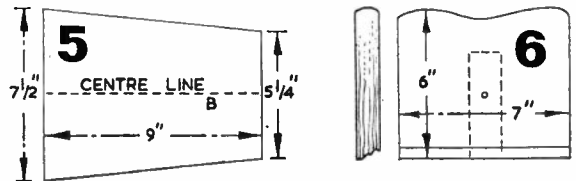
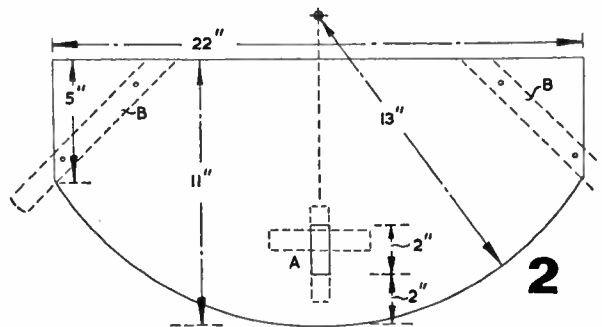
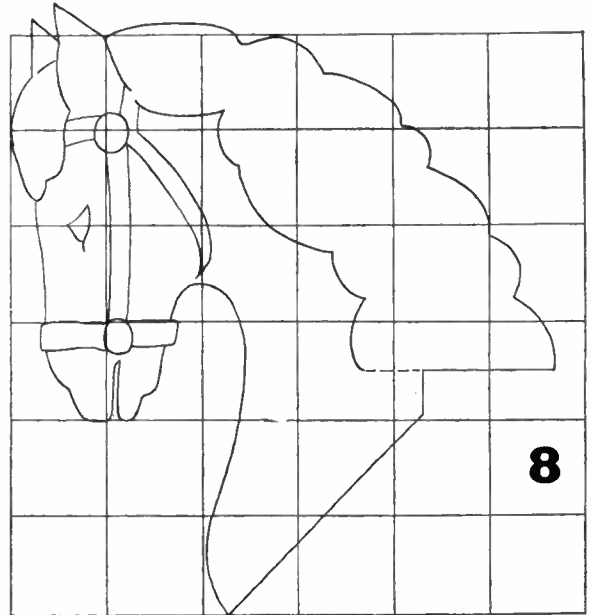
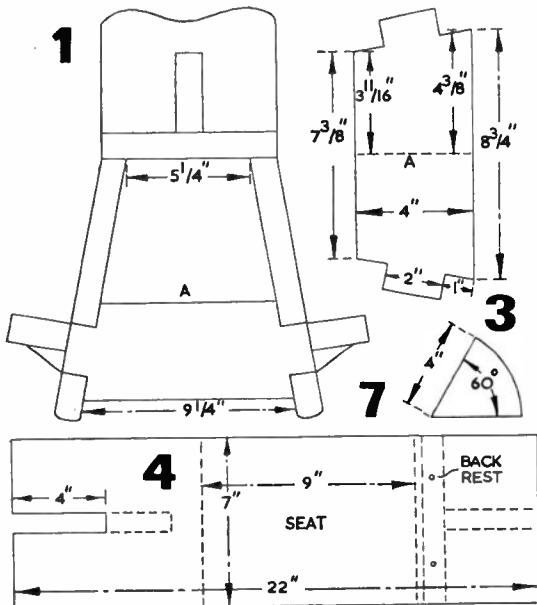
FOR sheer delight and amusement, the old-fashioned rocking-horse still seems to hold first place with the younger children. There are various types of rocking-horse; some have just plain rockers attached to the feet of the horse, while others have metal fittings which give a secondary movement to the horse beyond the plain rockers.

We show here how to make a strong and safe rocking-horse of rather a different type. The measurements overall are: length 2 ft. 3 in., height from floor to top of head 1 ft. 8 in., and width of seat 7 in. Our choice of wood is deal, as it is easily worked and can be painted up in bright colours when finished.

Details of construction are given in Figs 1 to 8. We would point out that in Fig. 1 the sides are shown splayed out slightly at the foot which gives a little wider floor bearing than if the sides were carried down at right angles to the seat. A little more work is entailed in this method in beveling the upper edges of the sides where they meet the underside of the seat, and in the shaping of the cross-rail A, and the two ends B. The wider floor bearing is, however, to be preferred.

Good straight-grained wood $\frac{3}{4}$ in. or $\frac{7}{8}$ in. thick is suitable, and work should be commenced on the sides as shown in Fig. 2. Set out the shape shown and mark in on the wood the position of the sloping ends B, and also the mortises A. From the diagram in Fig. 3, set out the cross-rail A, using the centre line, shown dotted, for accuracy. Test the tenons in the mortises of the sides before actually gluing together.

Next make the top from Fig. 4, marking in the position of the seat and backrest. Make the backrest as shown in Fig. 6, and bevel the edge where it meets the top. Cut the ends B, to the outline given in Fig. 5, using the centre line for the setting out.



In assembling, first glue the cross-rail A, into the sides, then add the backrest to the top, putting in screws through the top to make a firm holding.

The backrest support seen in Fig. 7, is next cut and glued and screwed on. Next add the ends B, inserting screws in the places shown in Fig. 2. Fit the top carefully to the sides, etc., and glue and screw it firmly in place.

The head of the horse may be enlarged from the diagram in Fig. 8, the squares being 2 in. Wood at least $\frac{3}{8}$ in. thick should be used for the head, and it can be cut round with a coarse fretsaw. It is suggested that two overlays be cut from $\frac{3}{8}$ in. wood to the shape of the horse's mane and glued one

on each side of the head. They can be shaped, rounded off and glasspapered smooth. Fit the head into the opening in the top and see that it beds evenly on the end B, before adding the glue and screws.

In forming the seat, cut a piece of wood 9 in. by 7 in. and pad it with some soft material and cover with tapestry or rexine nailed to the edges of the board. Add two simple footrests about 5 in. by 2½ in., with triangular blocks of wood as brackets glued underneath.

Clean up all the woodwork, paint up suitably and add leather trappings to the head of the horse. The backrest may be padded and covered with rexine to match the seat. (M.h.)

CHEMISTRY AT HOME

Boron Compounds

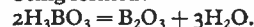
By L. A. Fantozzi

Two compounds of the element boron, B, are familiar in everyday life, namely, borax (sodium tetraborate, $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$) and boracic powder (boric acid, H_3BO_3). Not only are these used for water softening and in medicine, but much more widely in glass making, metallurgy, ceramics, textiles and in industry generally.

Boron does not occur in the free state in nature. Boric acid and several borates are found as minerals in certain places where there is or has been volcanic activity. Boric acid, for instance, is found in the volcanic fumaroles or vapour jets of Tuscany, Italy, and these are an important source. About 95 per cent of the world's borax is supplied by the U.S.A. from the mineral kernite, $\text{Na}_2\text{B}_4\text{O}_7 \cdot 4\text{H}_2\text{O}$.

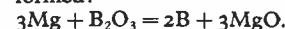
Although its preparation is easy few chemists ever even see boron. So it is of interest to have a specimen. Put 10 grams of boric acid on a clean tin lid and heat it. The powder

melts and soon turns to a pasty mass of steam distended bubbles, water being given off and boron trioxide, B_2O_3 , being formed:



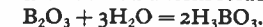
When bubbles stop forming let the mass cool, chip it off the lid, powder it and mix 3 grams of it with 1 gram of magnesium powder, Mg.

Heat a tin lid and strew the mixture thickly upon it. When the tin attains a red heat a sudden glow surges through the mass, boron and magnesium oxide, MgO , being formed:



After cooling, coarsely powder the lumpy mixture and drop it in small portions into a mixture of 15 ml. of water and 7.5 ml. of concentrated hydrochloric acid, HCl, (caution skin corrosive; any on the fingers should be flushed off with water and wet sodium bicarbonate, NaHCO_3 , dabbed on). Leave the whole for about half an hour. Then filter it off. Wash it thoroughly on the filter until one wash water shows no acid reaction, that is, blue litmus paper is not reddened by it. Continue washing until the residue consists of an even loose black powder and then let it dry.

Prepared thus boron is amorphous and brown to black in colour. Heat a little to redness in a crucible. In contact with the oxygen, O, and nitrogen, N, of the air it now forms boron trioxide and boron nitride, BN, but the action is not complete since the two form a coating on the boron and prevent further reaction. Were it otherwise this would give an easy means of preparing boron nitride. It would only be necessary to heat the reaction product with water, when the boron trioxide would form soluble boric acid:



while the nitride, being insoluble in water, could be separated by filtration.

Boron nitride is prepared by heating anhydrous borax, $\text{Na}_2\text{B}_4\text{O}_7$, with ammonium chloride, NH_4Cl . Sodium chloride, NaCl, hydrogen chloride, HCl, and water are also formed:



As the actual yield of boron nitride is low, rather large quantities need to be worked with.

First dehydrate 40 grams of borax by heating it until no more steam is evolved and the whole is at a low red heat. As borax swells greatly during the first part of the dehydration the operation should be conducted by dropping small quantities of borax into a hot crucible and waiting for shrinkage before adding more.

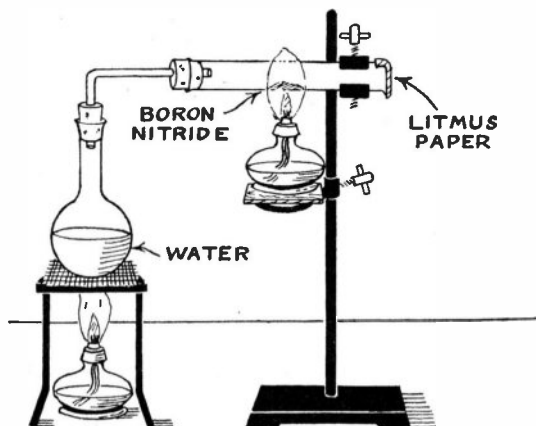
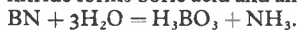


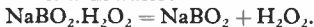
Fig. 1. Reaction of boron nitride and steam

Powder the cooled anhydrous borax and mix 20 grams of it with 40 grams of ammonium chloride. Heat this in a large lidded crucible until white fumes cease to escape and the mixture is red hot. Let the crucible cool, fill it with water, allow to stand overnight, stir up the white turbid liquid, pour it into 250 ml. of boiling water and filter it hot. The boron nitride remains on the filter as a white powder. It may be further purified by allowing several lots of water to run through the filter paper. Then let it dry. It is a soft white powder rather like talc.

Heat it in a small crucible in a darkened room. It phosphoresces with a ghostly greenish light. Let it cool and heat some of it in the middle of a hard glass tube while passing steam over it, Fig. 1. Hang a slip of moistened red litmus paper at the open end of the tube. It is turned blue, showing an alkaline gas to be formed. Smell the end of the tube. Ammonia, NH_3 , will be noted. On heating it in steam boron nitride forms boric acid and ammonia:



An important compound of boron these days is sodium perborate, $\text{NaBO}_2 \cdot 4\text{H}_2\text{O}$. It is a white crystalline solid which liberates hydrogen peroxide, H_2O_2 , in warm aqueous solution. This results in a mild bleaching and disinfecting action. Because of this it is used extensively in washing powders, mouth wash powders and deodorants. Some chemists regard it as a compound of hydrogen peroxide and sodium metaborate, NaBO_2 , with water of crystallization — $\text{NaBO}_2 \cdot \text{H}_2\text{O}_2 \cdot 3\text{H}_2\text{O}$. Some weight is given to this view by sodium metaborate being formed when the compound reacts with water:



To prepare a specimen dissolve 5 grams of borax and 1 gram of sodium hydroxide, NaOH , in 170 ml. of cold water. As solid sodium hydroxide attacks the skin care should be taken. Any on the fingers should be flushed off with water and vinegar dabbed on. To this solution gradually add 30 ml. of 10 volume hydrogen peroxide. Cool the whole by standing

BORAX AND SODIUM HYDROXIDE

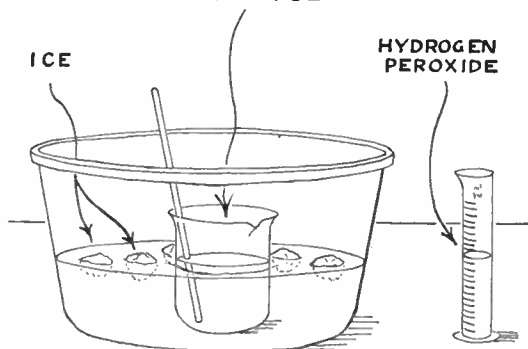
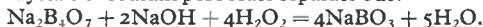


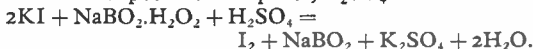
Fig. 2. Preparing sodium perborate

the beaker in water to which some pieces of ice have been added and allow to stand awhile, Fig. 2. Large transparent crystals of sodium perborate separate out:



When crystal formation stops filter off the crystals, wash with a little cold water, let it drain through, then wash once with methylated spirit, drain again and finally rinse with ether, $(\text{C}_2\text{H}_5)_2\text{O}$, and let the crystals dry in the air. As ether vapour is much more highly inflammable than that of methylated spirit the washing and subsequent drying should be done in flame free conditions, preferably in the open air.

One of the properties of sodium perborate may be seen by adding a little to a solution of potassium iodide, KI , to which some dilute sulphuric acid, H_2SO_4 , has been added. The liquid turns brown from liberation of iodine, I_2 , and formation of potassium sulphate, K_2SO_4 :



TOY FELTOGRAPH

WITH the aid of a feltograph you can produce hundreds of colourful pictures. Funny faces, zoo animals, quaint people, seascapes and aeroplanes can all be fashioned from the bright felt pieces used. The toy works because felt scraps will stick to a felt-covered board when you press them lightly with your fingers. The rough cloth fibres become tangled together and make the felt fragment stick fast.

To construct a feltograph board you'll need a sheet of really stout cardboard, cut out of a box lid — and a large piece of green or white felt which must overlap the cardboard by a $\frac{3}{4}$ in. margin all round. Fix the felt to the cardboard, using Sellotape strips. The felt's surface must be tightly stretched while you do this — so you may need a friend's help.

Complete the feltograph by gluing a sheet of thinner white cardboard on the back of the board, in order to conceal the bent-over felt margins and to present a neat finish to your work.

Now you must prepare dozens of little geometrical shapes by cutting out strips, squares, ovals, circles and triangles of gaily coloured felt scraps. Then find a small box in which to

store the felt fragments after use. Youngsters need no difficult technical skill to play at being artists with this ingenious toy. (A.E.W.)



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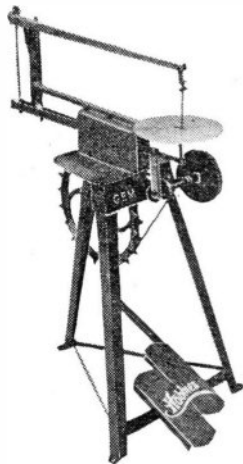
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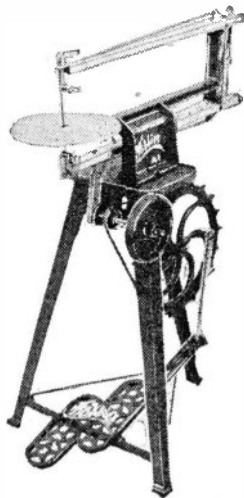
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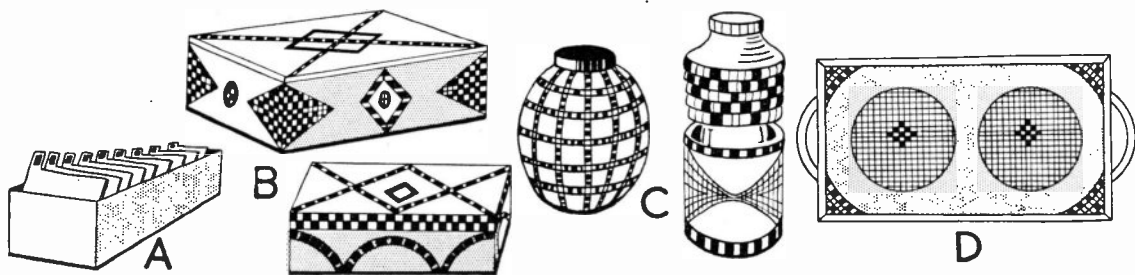
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Uses for Stamps

THOUSANDS of used postage stamps are thrown into waste-paper baskets every day, and this is a shocking waste of good artistic material.

The practice of using old postage stamps to decorate boxes, trays, vases etc, is not new, but has perhaps been neglected in recent years.

A great deal of very pleasing and satisfying work can be undertaken at very small cost to the 'postage-stamp' artist. The only equipment required is a good supply of used stamps taken from envelopes etc, a small pair of scissors, a bottle of gum, and brushes.

Naturally, an extensive supply of stamps will have to be collected, and they must be entirely removed from the envelopes or cards.

The best method of removal is to tear off the portions of envelope or card on which the stamps are stuck, and soak them in a bowl of warm water for about five minutes. It is then an easy matter to remove the stamps. Place them between sheets of blotting paper to dry.

The stamps should then be stored in a way that will give means for quick and easy handling. A good method of storage is to make use of old foolscap envelopes. Cut off the bottom portion to form a good strong pocket, leaving a small flap at the top on which can be stuck a sample stamp to facilitate easy reference. These pockets can then be placed in a disused oblong box or tin as at A. This is your 'artist's palette' from which you can select and 'mix' your colours.

A good adhesive is ordinary gum arabic, but there are many other adhesives on the market today from which to choose. Your stamps must not peel once they are applied.

A small brush only is necessary, but choose one that has firm bristles and is flat at the end.

There are two methods of applying your stamps. Firstly, to stick the stamps on the outside of objects; secondly, to stick the stamps by the face on to glass.

Take a disused cigar box, for instance, or a wooden trinket box that has become soiled through constant use. These articles can be rejuvenated and made into most attractive pieces by the skilful application of coloured stamps as shown at B.

Spend a little time in planning your designs, don't rush things! A good idea is to place your box on a piece of plain paper and trace its shape. Experiment a little on this space with your stamps until you have worked out a pattern that pleases you, then go ahead and produce a work of art.

It will be necessary to cut some of the stamps to complete

the corners or edges of a particular pattern. In this case do not always arrange for the cut row of stamps to be on the outside edge. Sometimes they will fit in quite nicely with the general plan, but it will probably be found more effective to keep full-size stamps at the edge and arrange for the line of cut stamps to come inside the outer row. A little care and patience here will bring the best results.

Take great care over the actual sticking down of the stamps to avoid the risk of peeling off. Completely cover the surface of each stamp, lightly press into place with the fingers, and then place a piece of blotting paper on top and rub thoroughly.

Many commodities today, such as coffee, marmalade etc, come in most attractive and well-proportioned glass containers. These articles such as those at C can be made into very attractive vases by covering them with a pattern of brightly coloured postage stamps.

Where there are grooves in the glass, stamps can be worked into these with a blunt knife or artist's palette knife.

The 'thread' at the rim of the jar can be filled with one of the quick drying 'fillers' available today, and smoothed with a wet knife. When this part is completely set, it too can be covered with stamps.

Apply your stamps squarely or cornerwise according to your inclination. Objects with curved surfaces will often necessitate some overlapping of stamps, as it is much too tedious to cut shapes for fitting together.

Finish all your work on boxes and vases with one or two coats of artists' clear varnish. This varnish can be applied direct to the stamps, but be sure that the gum has had time to dry completely.

The second method of working, namely, sticking the 'face' of the stamps on to glass, is more suitable for flat surfaces such as tea trays or perhaps for making a 'picture' fire-screen.

Some tea-trays have a pictorial design painted on to the underside of the glass. In time this design flakes, and a patchy, untidy appearance results. Here, stamp artistry as shown at D can be applied to save a serviceable article from being scrapped.

Remove the glass and soak it in a strong detergent solution for fifteen minutes. The original design should then peel off quite easily.

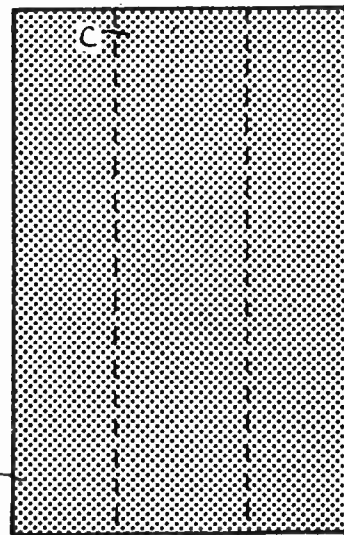
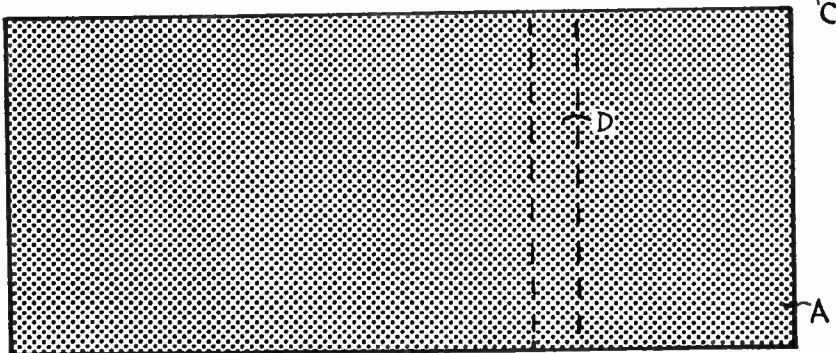
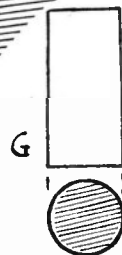
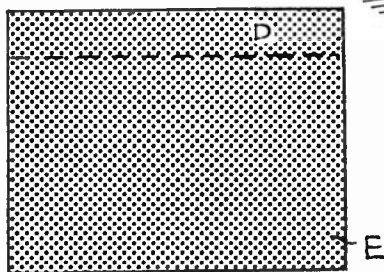
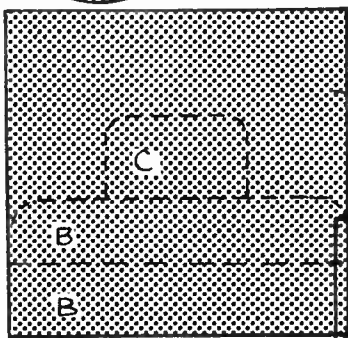
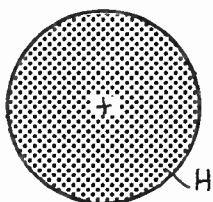
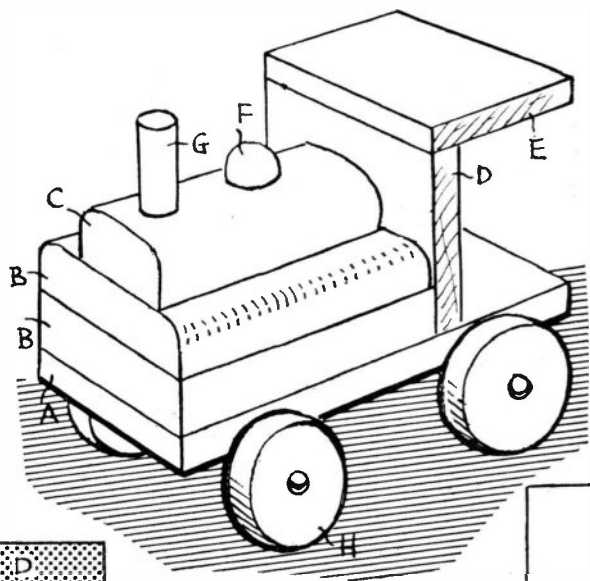
Dry the glass thoroughly, and then plan a pattern for your stamps on a piece of white cartridge paper of the same size as the glass. Place the glass over these and proceed to stick a corresponding set of stamps face downwards on the glass. Finally, and when the stamps are completely dry, coat the whole surface with glue and stick the glass down into the tray. (J.W.J.)

MAKE THIS TOY TANKER

THE parts of this toy tanker are all shown full size and should be cut out with a fretsaw. You will need one each of A, D and E cut from $\frac{1}{2}$ in. wood, two of B and one of C from $\frac{3}{8}$ in. wood also four wheels H, $\frac{1}{4}$ in. The two pieces F and G are shaped from $\frac{3}{8}$ in. round rod, and the two axles are cut from $\frac{3}{8}$ in. square stripwood.

The parts are glued together as shown in the detail, one piece B and piece C being rounded off as suggested. Wheels are pivoted by means of $\frac{1}{2}$ in. roundhead screws and the whole engine is painted in bright colours. Use any high gloss non-toxic paint such as Humbrol for finishing.

(M.p.)



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