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THE ORIGINAL
'DO-IT-YOURSELF'
MAGAZINE

HOBBIES *weekly*

FOR ALL
HOME CRAFTSMEN

★ *FREE Design Supplement*

Also in this issue:

AN ADJUSTABLE
SEE-SAW

COLLECTORS' CLUB

'HOLIDAY' ALBUM
FOR PHOTOGRAPHS

FATHER CHRISTMAS
FOR THE TREE

RECIPES FOR
SWEET MAKING

NOVEL PROJECTS

ETC. ETC.



**It plays
a tune
for each
penny
saved**

A PIXIE HOUSE MONEY BOX



Up-to-the-minute ideas

Practical designs

Pleasant and profitable things to make

5^D



FOOTBALL is a popular feature of the stamp album. Collectors interested in this thematic sideline will find the following notes useful.

KICKING: Use the front upper part and side, not the toe, of the boot. In straight kicking keep the toe down and contact the ball with the instep. Learn to kick to the left with the left foot, and to the right with the right foot. Aim to become efficient with both feet; the 'one-footed' kicker rarely makes a first class footballer.



Learn to alter the direction of the ball without stopping or 'trapping' it; this is essential for quick shooting at goal. Practise the long, low kick, just out of reach of the players' heads; this is particularly useful for passing. Concentrate on dropping the ball where it is wanted, rather than making a long, showy kick which will probably land at the feet of one of your opponents. Corner kicking is very important and should be well practised.

HEADING: Use the forehead or side, not the top of the head. This, aided by the neck muscles, will enable you to give speed and direction to the ball.

PASSING: This is one of the finer points of football. A baffling series of successful passes during a run up to goal mounts up the excitement and is a pleasure to watch. It shows excellent team work, and ability to give and take passes at the right moment at once marks out the 'crack' player.

Always keep a sharp eye on the field. When you receive a pass, make up your mind at once — if you have not already done so — what you are going to do with the ball. If you hang on to it too long you may lose it and check the whole forward movement.

TACKLING: Use your shoulder, not your chest. Be more concerned with making your man pass hurriedly and badly than with taking the ball from him. Get in front of him and, if he dodges, stick to him and have another try.

DRIBBLING: This is a very important branch of the art and often neglected. A good dribbler keeps the ball 'on his toe' without looking at it, his eyes are on the field and position of the players; thus he is ready to make his pass at the right moment and in the right direction.

FORWARD PLAY: Left and right wing forwards should not wander too far into the corners of the ground where their usefulness is limited. 'Go for the goal' is the golden rule for forward play. Immediately after passing, the player should try to take up a good position for receiving the ball again. Forwards should worry the opposing backs as much as possible; and when defending, should not dribble, but kick out to the wings.

HALF-BACK PLAY: The centre half has the most responsible post in the field. He should not keep the ball, but part with it at once to the best advantage.

FULL-BACK PLAY: The two full backs must work together, and with the goalkeeper, whom they must protect from being charged.

GOALKEEPING: The goalkeeper has the most difficult job of all; and it is a mistake to put a player in goal 'to keep him out of the way'. Rule for the goalkeeper is 'hands before feet'.

THE *pièce de résistance* in Book mark Land are the tiny treasures in sampler type. They are worked on stiff cardboard, in silk, wool or beads, and the work is so minute that it appears gem-like in perfection. These are called petitpoint. The patterns are also stamped or hand drawn and portray a cross-file of mid-nineteenth century sentiment.

There are floral wreaths, anchors, crosses, Bibles, harps, names like Anna, Flora and Mary. I have one with the name 'Gusta' on beautiful white ribbon with a lacy edging, it carries a wreath of real hair (Titian) tied with a tiny bow of baby ribbon. It used to be quite the thing to snip locks of hair for memory's sake.

BOOKMARKS—II

There are numerous mottoes like God Bless our School, God Bless our Home, The Key to my Heart, To my Darling, Peace and Love, Welcome, Forget me not, etc.

Bibles quotes or pious sentiments noted are: In God We Trust, Holy Bible, Search the Scriptures, Thou art my Hope, Thou God seest me, The Lord will Provide, The Fear of the Lord is the Beginning of Wisdom. Many of these are breathtakingly beautiful. They are mostly Berlin work.

One unusual specimen depicts a large parent house done in glowing colours, including shady trees, and on either side a smaller home, more than likely the dwelling of married offspring.

Among the sampler type in the collection is a box filled with small finished pieces depicting squirrels, sailing ships, high smoke stack engines, kerosene lamp and chimney, and topping the group a handsome rooster, flaunting lively feather tints, proclaiming to all and sundry, Arise — 'Tis Morn! These may have been the stint set out for the children of the family, and must have furnished many happy moments to the little needlewomen of that day.

About the turn of the century many bookmarks appeared in the holiday greeting card trend. Beautifully printed in soft colours, attached to ribbons in coloured embossed satin, they embraced scenic, religious, sentimental and children's series. They were the last mass effort in the nineteenth century commercial production, and were published by Raphael Tuck, Rust Craft, and several other well-known publishers.

The earliest of the pierced card type are those with embossing. They were

● Continued on page 187

AN ADJUSTABLE SEE-SAW

FEW children can resist the thrill of a see-saw! Likewise there also seems to be no age limit to this pleasure, for adults also enjoy its thrills.

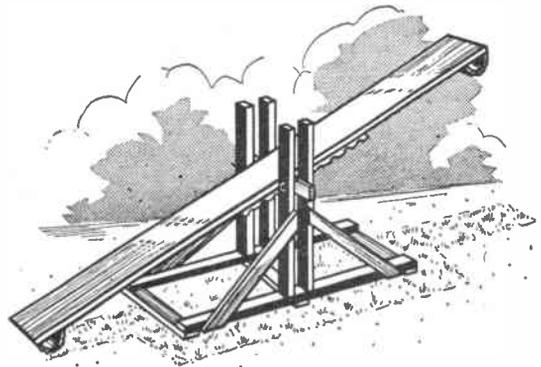
We have, therefore, designed a see-saw which can be adjusted in height to suit the size of the users. Quite young children need it very near to the ground, whereas big brother wants the centre at least 2 ft. high.

Another important adjustment which can be made concerns the weight of the people using it, and it is possible for a small child and a fairly weighty person to have a see-saw without one being right on the end and the other, perhaps, more than halfway down one side.

Two strips of wood having a series of notches spaced 2 or 3 in. apart are fixed to either side of the see-saw plank. By moving the plank along into different notches we are able to alter the leverage ratio until it correctly balances the two persons using it.

The measurements given are for an average sized see-saw with a plank about 8 ft. long and 9 in. wide, but these can easily be altered for other sizes. The

By
A. F.
Taylor



The supporting bar, or fulcrum, of the see-saw is 15 in. long, 2 in. wide and 1 in. thick, and the top part is either rounded or planed to a blunt point. This bar may rest on top of the bolts in the uprights, or in order to make it more secure, a hole can be drilled in each end and the bolt pushed right through.

Notched bars, 1½ in. wide and 1 in. thick, are fixed to the underside of the plank, and will vary in length according to the amount of leverage required, but a length of, say, 24 in. should be sufficient for most purposes. Semi-circular notches are made about 3 in. apart. As there will be a considerable amount of wear on the notches and fulcrum, it is advisable to use a hardwood, and oak is probably the best.

Three or four screws will secure the bars. When fixing them, first find the centre of the plank, and at this spot put the end notch. For persons of equal weight rest this notch over the fulcrum, but when one is heavier than the other, move the plank along until the correct notch is found which will give an even balance.

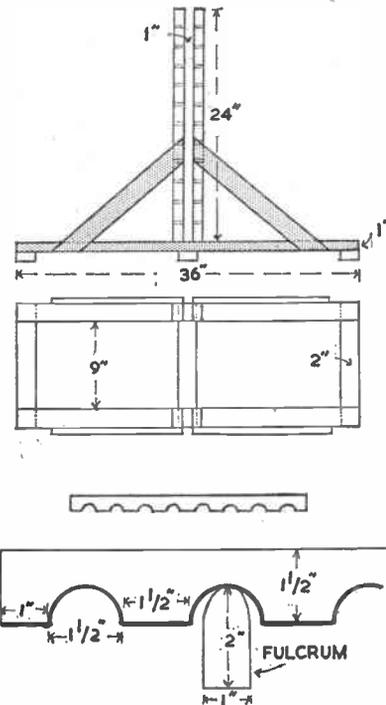
Pieces of motor tyre section nailed underneath the ends of the board make ideal 'springs' to ease the bumps.

centre support enables the fulcrum to be placed at varying heights up to 2 ft., and this should be sufficient for most purposes. If, however, it is required much higher, then the base strips should be increased well beyond 3 ft. in order to give added stability, and the width also could be increased with advantage.

For the base of the support we need two 3 ft. lengths of 2 by 1 in. wood. In the centre of each fix two uprights of the same 2 by 1 in. wood, leaving a space of 1 in. between them. These uprights are 2 ft. long and two 2 in. screws should hold them secure. Added support is achieved by fixing struts between the base and the uprights, and these are cut from wood 18 in. long, 2 in. wide and ½ in. thick.

Before fixing the uprights in position drill a series of holes along the centre of each at a distance of 2 in. apart, just large enough to take a ¼ in. bolt.

The two supports need to be kept 9 in. apart (or the width of the plank). This can be done by fixing spacers underneath the base strips at either end, and also one in the centre, which will take the entire weight of the plank together with the people on it. Three pieces 13 in. long of 2 by 1 in. wood will be needed for this.



● Continued from page 186

Collections of Bookmarks

made by early publishers such as Windsor and Wood, both of whose names are well known to Valentine collectors, and these could have passed as Valentine tokens were the sentiments and groups just a little different. The one marked Windsor is pierced through its entire length, the edge a highly embossed flower border. In a circular cartouche at one end is a family group (Biblical feeling) in high relief, with background cut out. They are waving farewell to some unseen person. The words 'Aus Leibe' are worked in white silk on the length of the marker (1840 to 1845).

The second is of a family group, on pleasure bent. A father fishing, a daughter reading a book, seated at the edge of the stream. A mother walking beside a mule on which a small daughter is taking a timid lesson in riding.

Today's trend toward condensed editions, rapid reading courses, etc., has again brought to the fore an awareness of that delightful, delectable time saver — the bookmark.

'Place me between your pages,
And like a sentinel so true,
I'll guard your place and save it,
And hand it back to you.' (Anon.)

D.C. MODELS FROM A.C. MAINS

WITH some models direct current is necessary. This is so with trains, and where a permanent magnet motor is used, and also for experiments such as electroplating. A low voltage for a model can easily be obtained from A.C. mains, by using a transformer in the way described in the last article in this series. This low voltage output from the transformers is also alternating, but it can be changed to direct current by adding a rectifier. The current obtained from the rectifier can be used for any purpose where D.C. is essential, such as those already mentioned, and for charging up accumulators.

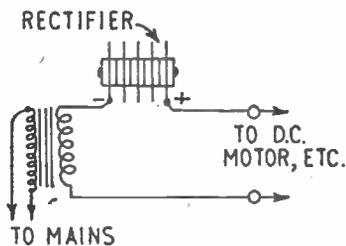


Fig. 20—Half wave rectifier circuit

A metal rectifier is most convenient, and will be quite inexpensive and have a very long working life. It consists of a number of metal-oxide discs or rings, frequently with cooling fins, and it allows current to pass in one direction only. For example, the positive part of each A.C. cycle may be allowed to pass to the model, while all the negative cycles are halted.

Half wave rectifiers

A rectifier which will allow only positive cycles to pass, when wired to the transformer secondary as shown in Fig. 20, is known as a half wave rectifier. The transformer is only used to reduce the voltage, and isolate the model from the mains.

A.C. mains have a frequency of 50 cycles per second, so that the output from the rectifier is really pulsating to agree with this. With all ordinary models this makes no difference, and a voltmeter would show the average D.C. voltage, exactly as if current were being taken from a battery.

Half wave rectifiers have two tags. For many models it will not be necessary to bother about the polarity. But for electro-plating or accumulator charging, the polarity has to be known, and the markings on the rectifier should then be followed. These will be on, or near, the

tags. Negative may be indicated by black, or a negative sign. Positive is shown by red, or the plus sign.

Full wave rectifiers

With these, matters are so arranged that both positive and negative pulses are rectified, and made to give a D.C. output. Such rectifiers are often used, because the current is smoother than with a half wave rectifier.

By 'Modeller'

The most convenient type of full wave rectifier has four tags, as shown in Fig. 21. The transformer secondary is wired to the 'A.C.' tags, which may be marked 'A.C.', or with a sign like 'S' on its side, or coloured green.

The output tags of the rectifier are marked red and black, or positive and negative. The positive connection is sometimes in the middle, instead of the negative. The two outer tags, which are positive in Fig. 21, would then be negative, and marked to show this. They are permanently joined by a metal rod or stout wire. The rectifier may not have so many plates as in Fig. 21.

Rectifier ratings

The working voltage and current rating of the rectifier should be chosen to suit the transformer, or to agree with the largest output which will ever be wanted. For example, the rectifier might be rated at 6 volts 1 amp. This means that it can be used with any voltage up to 6 volts, and that any current up to 1 amp may be drawn. It could be used with lower voltages and current, if desired, but should not be used for higher voltages or currents.

If the mains transformer were rated at 12 volts 2 amps, as already explained when transformers were dealt with, then a 12 volt 2 amp rectifier would be suitable for use with it. Direct current up to 2 amps could then be drawn.

If the voltage required by the model is not known, a transformer and rectifier can be selected to give about the same voltage as that of the batteries normally used. A somewhat higher voltage will also do, because a resistance can be added to drop this if necessary.

It is also necessary to remember that some voltage drop arises in the rectifier. For example, to obtain a full 12 volt output, at maximum current, an input of

15 volts may be needed for the rectifier. To compensate for this, a tapped transformer, or control resistor, will be of advantage. These were dealt with in the last article in this series. If the voltage is a little high, it can easily be reduced with a resistor. But if it is too low for the model, nothing can be done to increase it. For this reason it is best to obtain a transformer which will give plenty of output, if the exact voltage needed is not known.

Practical construction

Metal rectifiers should be mounted with the fins vertical, so that air may rise between them for cooling purposes. The rectifier will grow quite warm when used at maximum output.

Fig. 22 shows a practical wiring plan

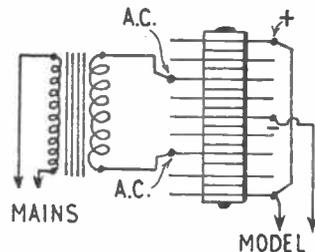


Fig. 21—Full wave rectifier circuit

and layout for the circuit in Fig. 20, and illustrates some important points. If these are observed, safe and reliable working can be expected.

Mains voltages can give nasty shocks, so a properly insulated plug and length of good quality flex must be used to supply the transformer with current. If the transformer has leads emerging from the bobbin, these can be joined to the flex at a fully insulated connecting block. Alternatively, the whole unit can be housed in a wooden case, with ventilating holes. This would be wise if the transformer has exposed tags on a tag strip, with the flex soldered on, because shocks could arise if these tags were touched.

The rectifier has its fins vertical, as mentioned, and a pair of brackets cut from scrap metal can be used to mount it. Two terminals are provided to connect up the model. These terminals can be on the side of the containing case, if used, because they are safe to touch, if the unit is properly made.

It is wise to include a fuse between the rectifier and one terminal. This can consist of a short length of 2 amp fuse wire. Its purpose is to protect the transformer and rectifier if a short circuit arises in the model, or leads.

In most cases current can be taken from a 3-pin mains plug. If so, use 3-core flex, connecting the green lead to the large earth pin. In the unit, this lead is connected to the transformer metalwork, and one secondary lead, as explained in the previous article on transformers.

There will, however, be two leads from the transformer to the rectifier, and two leads from rectifier to the terminals for connecting up the model.

Running the model

When connected, the model can be

output from the unit may cause humming or buzzing. This is often of no importance. If necessary, it can be reduced or cured by wiring a large capacity electrolytic condenser in parallel with the unit terminals. This condenser must be connected in the correct polarity — positive tag to positive terminal. It can be of some 2,000 to 6,000 mfd., and it is rated at some 6 volts or 12 volts, to suit the output voltage of the unit.

For electrolysis and electroplating, a variable output will usually be necessary. A variable resistor should then be wired in series with one lead from the unit.

For accumulator charging, the battery can be connected directly to the unit, if the output voltage is suitable, care being taken to observe polarity (positive on accumulator to positive terminal). If the unit gives too high a voltage for the battery, a variable resistor is added in one lead. A charging meter may also be added in series with the resistor, which is then adjusted until the meter shows the required charging current for the accumulator. Details about charging accumulators for model motors, radio sets, motor-cycles, etc., will be given later in this series.

Motors are run exactly as with a battery, and it will be remembered that the direction of running can be reversed by changing over connections to the motor.

NEXT—

Models with D.C. Mains

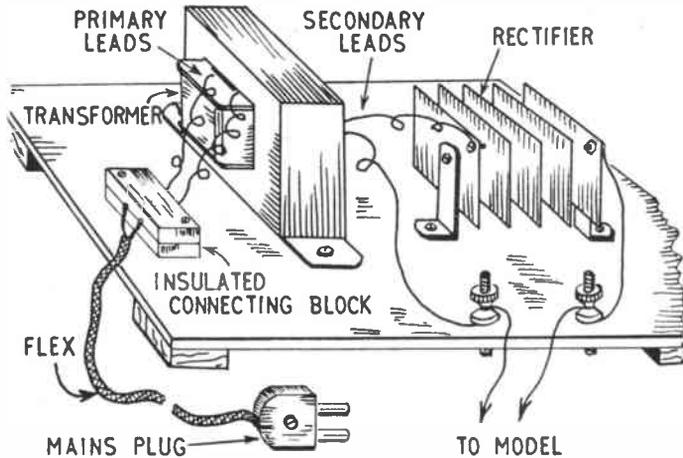


Fig. 22—Practical form of circuit in Fig. 20

This earths the model circuit. It is also a good plan to have a small-rating (say 1 amp) cartridge fuse in series with the red mains lead, which should go to the 'Live' (L or red dot) pin of the mains plug. The unit, and user, will then be fully protected.

If a full wave rectifier is being used, the unit can be made up as in Fig. 22.

switched on and off, and manipulated in exactly the same way as if batteries were used. But when the unit will not be employed for some time, it should be disconnected from the mains. This can be done by switching off at the mains socket, or by pulling out the mains plug.

In a few cases, as when experimenting with electromagnets, the fluctuating

A Dart Trap for Target Practice

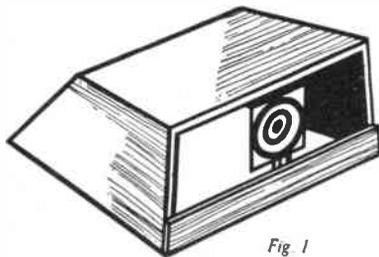


Fig. 1

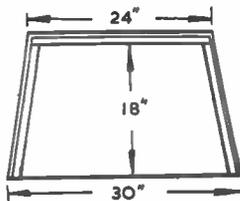


Fig. 2

AMATEUR marksmen often find that when at target practice darts that do not stick into the target are apt to get hopelessly lost. If the practice is indoors, darts are apt to rebound off the walls, and not even their bright silken tassels can make them easy to find. With outdoor target practice, the problem of dart finding is far worse, when there is the undergrowth to

contend with.

Fig. 1 shows a simple dart trap, which eliminates the lost dart problem except in the case of exceptionally bad marksmanship, when not only the target is missed, but also the entire trap.

The rear, top and sides are made of hardboard, and are strong enough to withstand any dart. The rear, with measurements according to Fig. 2 (or on a similar scale), slopes at about 45°, adds strength, and makes the dart rebound in a downward direction. A lesser slope at the sides also performs a similar function, while a 3 to 4 in. strip of wood or hardboard in front, at the base, prevents the dart from sliding out of the trap, and it also acts as protection to any lighting arrangements. With darts at 3d. each, this trap soon pays for itself.

Fig. 3 shows a target stand. The target is placed in a saw-cut at the end of a ½ in. dowel, glued into a substantial base that will not topple over each time a dart hits the target. (G.E.G.)

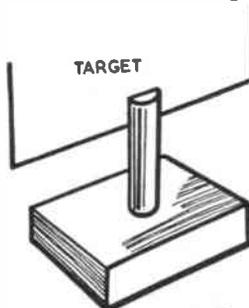


Fig. 3

For those special snaps

MAKE A 'HOLIDAY' ALBUM

A HOLIDAY snapshot album is the best way of keeping a perfect record of a happy vacation, for the pictures will retain their original brightness and remain free from blemishes since they are never actually handled. Moreover, you can add your own titles, comments and notes about the

By H. Mann

holiday as the album is assembled. If you wish you may also include souvenirs of visits to theatres, etc., by way of the programmes, making a complete reminder of your holiday and something more than merely a snapshot album.

Such a book can be quickly made at little cost and, if prepared on the loose-leaf principle, you will provide the exact number of pages required. Pastel paper, which is sold at art shops in sheets measuring 20 in. by 30 in., can be bought and cut up to a convenient size, while you have the choice of black, buff, grey and many other neutral tints. A suitable size for either 2½ in. by 3½ in., or 3½ in. by 4½ in. photographs is 9 in. by 6 in., and the sheets should be cut accordingly as in Fig. 1. You may, of course, vary the size as you wish. Take care that the pages are squarely cut and of equal size. You may also like to consider the insertion of a protective leaf between each album page in the form of greaseproof or tissue paper prepared to the same size.

We now require a small cardboard template measuring 1 in. wide and equal in length to the width of the paper. This is shown in Fig. 2, where positions for three holes are indicated. The purpose of this is to ensure that the holes in the pages will all be in perfect register.

Place a few pages on a board with the template in exact register with one end

of the pages. The holes can be punched in by means of a saddler's punch — using a ½ in. bit — and a hammer. You will find it quite easy to punch about six pages at a time in this way, and the same operation is repeated for the remainder. Alternatively, you may use a leather punch if available, in conjunction with the cardboard template.

We now require two pieces of cardboard, one for the back and one for the front, covered with a suitable binding paper, and a 3 in. strip of linen binding for fastening both together. First prepare the two pieces of cardboard equal in size to the leaves, gluing the binding strip on the outside while the loose pages are placed between. This will allow the correct amount of binding material at the edge and permit an overlap at the back and front of about 1 in.

When the two covers have dried, punch three holes to coincide with the leaves, using the template as before. The leaves can now be inserted and a cord threaded as shown in Fig. 3, ultimately tying the latter in a bow.

Photographs are best mounted in position by means of transparent corners and this will be found far more convenient and quicker than a paste mountant. Afterwards you may add your titles, notes, or comments in white ink, using an ordinary steel pen nib. You may find that this liquid clogs the pen, due to rapid drying, and the only remedy is to keep a piece of rag handy for frequent wiping. At the same time we should mention that it is possible to obtain white pencils from photographic dealers for the same purpose, although the white may not be so intense as the ink.

If you would like to make a really distinctive album we would suggest you prepare a large cover picture for the front as illustrated. The photograph itself is one selected from the holiday shots, but note the superimposed titling.

To obtain this effect, first take a waste negative, placing in a dish of hot water for a few moments. This should soften the old emulsion for removal, leaving a clear piece of celluloid. If such soaking

● Continued on page 191

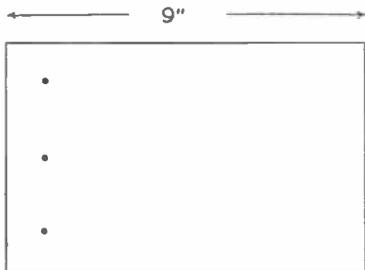


FIG 1

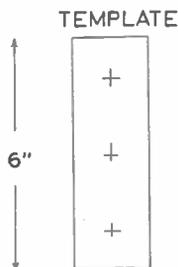


FIG 2

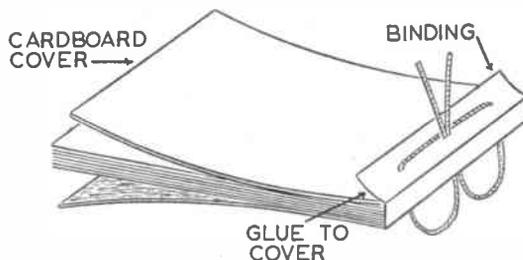


FIG 3

POULTRY DRINKING-FOUNTAIN

THE back-garden poultry keeper knows all about the problem of keeping his birds provided with a supply of clean water. The birds will soon foul or overturn any ordinary bowl or similar container. This fountain maintains a supply and resists the tendency of the birds to kick dirt into the water.

The important parts are a large bottle, preferably of the flat wine pattern, and something for the birds to drink from. The one used in the original fountain was an oblong plastic box intended for use in a refrigerator, and costing only a few

By John Lane

pence. The bowl or box should not have a rim and may be oval if an oblong one is unavailable. A round bowl does not give the birds room to drink unless it is very large, and then becomes wasteful.

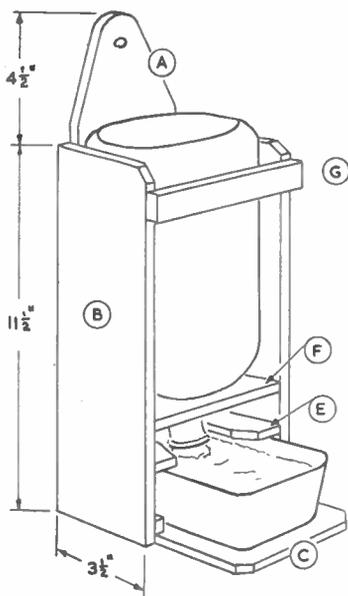
Sizes, of course, depend on the bottle and box or bowl, but those shown will serve as a guide. The wood may be anything available — $\frac{3}{8}$ in. is a reasonable thickness for all parts. The original fountain was made from resin-bonded plywood offcuts. Parts may be nailed or screwed.

Make the back board A about $\frac{1}{4}$ in. wider than the bottle and a little longer than it. Space and drill the top for hanging on a nail. The sides B should overlap the back and allow about $\frac{1}{4}$ in. clearance on the thickness of the bottle. Make a bottom C to fit between the sides and project far enough forward to support the box or bowl. If this item is much narrower than the bottle's width, put guide strips D on the bottom of the stand.

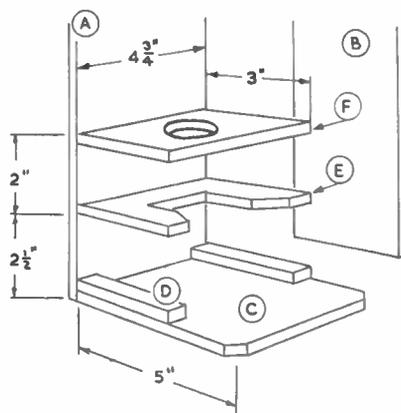
Controlling the depth

To hold the bowl down, either fit strips around the back and sides above it or cut a U-shaped plywood piece E. Assemble all of the parts so far made — 1 in. wire nails will do for $\frac{3}{8}$ in. wood. Fit in the bowl. Make a support for the bottle to fit into the stand F. If a suitable bit is not available, the hole for the neck may be cut with a fretsaw. Try the bottle and its support in the stand and arrange the mouth of the bottle so that it comes about $\frac{1}{2}$ in. below the rim of the bowl. This controls the depth of water, which will be $\frac{1}{2}$ in. or so above the mouth. Fix the support F, and add a strip G, across the top of the front to hold the bottle.

Arrange to hang the fountain so that



A BOON FOR THE BACKYARD POULTRY KEEPER WHICH CAN BE MADE AT LITTLE COST



the water level is about 6 in. from the ground — a convenient height for the poultry and far enough away from the ground to stand a good chance of keeping clean. To fill the fountain, fill the bottle with water, then invert the stand

over it with the bowl in position. When the bottle is fully in, turn the stand quickly the right way. Water will flow into the bowl until it is just above the mouth of the bottle and will remain at this level until the bottle is emptied.

● Continued from page 190

Make a 'Holiday' Album

fails because the emulsion has been hardened in processing, a sure remedy is to soak in a dish of undiluted household bleach — but see that this does not splash on to your clothing. For safety it is best to perform this operation in a sink. The bleached negative is rinsed in water and dried with a cloth, and the relevant title added in Indian ink. It will be found best to place the celluloid on white paper, writing the title in the centre. All you now have to do is to place the title negative on top of the picture negative, placing both together in the enlarger negative carrier, exposing as usual. The resulting picture can then be mounted on the binding cover as suggested.

Most holiday snapshots are usually taken at random from day to day, probably in different places, but this is no reason why your album should be

arranged in a haphazard fashion. Before setting about the task of mounting them in the album it is best to sort them out, arranging them in an orderly manner, which will allow you to make a written commentary either underneath the pictures or alongside. In this way it becomes possible to produce a brief, interesting, illustrated story of your holiday and you will not have to tell your friends the story of each and every picture. The album will speak for itself! When the pictures have been assembled in correct order they should be stacked together for mounting, and if you propose to include the souvenirs mentioned, do not forget to allow the necessary space, again in correct sequence.

You will find that making your own album in this manner is not only interesting in itself, but will also show a true record of which you will be proud.

Instructions for making

PIXIE HOUSE MONEY BOX

THE charming novelty of our design for the Pixie House Money Box has to be seen in model form to be really appreciated. Our black and white photograph of the prototype, which is shown on the front page, obviously cannot do justice to the grand display of colour which can be added to a model of this nature, and it is a subject which will appeal to grown-ups and children alike.

The house, which is about 7 in. square, has a delightful little balcony, windows with shutters, a decorative roof, chimney stack and pot, a flower-strewn trellis, toadstools and figures of a pixie and rabbit at the door entrance.

The model also acts as a money box, a slot being provided in the roof, piece 8. As a coin is inserted, it starts off a musical movement which plays the tune once and then stops. Because of its original and novel nature this design should be particularly pleasing for making up as a gift, for sale, or for exhibition purposes.

Most of the parts are shown full-size on the design sheet, and these, together with pieces for which measurements are given, should be transferred to their appropriate thicknesses of wood by means of tracing and carbon paper.

Hobbies Kit No. 3340 for making the Pixie House includes all wood and materials and costs only 7/6. Kits from branches, etc., or by post (1/6 extra) from Hobbies Ltd., Dereham, Norfolk.

A special No. 2 Musical Movement with coin trigger action costs 16/- (post 6d.). Tunes available are 'Teddy Bear's Picnic' and 'Happy Wanderer'.

Next cut all parts out with the fretsaw and clean them up well with glasspaper. The assembly throughout is by gluing,

that piece 2, which is cut from piece 1, will later be used as a mount for the musical movement, and reinserted into piece 1.

Fig. 3 shows the next step in construction by the addition of the two sides, 5, the front, 3, the ridge, 6, and the money shute, 7. This latter piece guides the coins on to the striker plate of the musical movement, an action which starts the tune.

Continue assembly with the addition of various pieces as shown in Fig. 4, including the roof, balcony, doors, chimney, etc. Note that the roof pieces should be of alternate light and dark wood. The chimney cap is a small cone formed from paper glued to a piece of wire which is wound round the top of the stack.

The mushrooms are made up as shown in Fig. 5. Shaping is completed with a modelling knife and rasp. Their approximate positions on the base are shown in the finished picture, but do

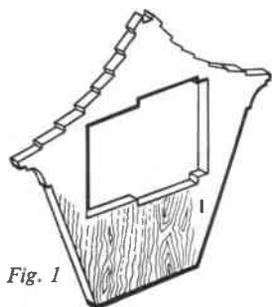


Fig. 1

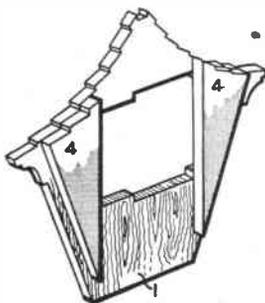


Fig. 2

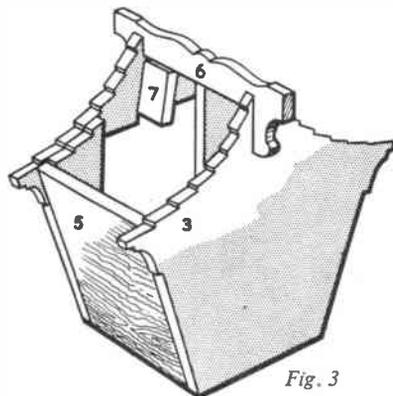


Fig. 3

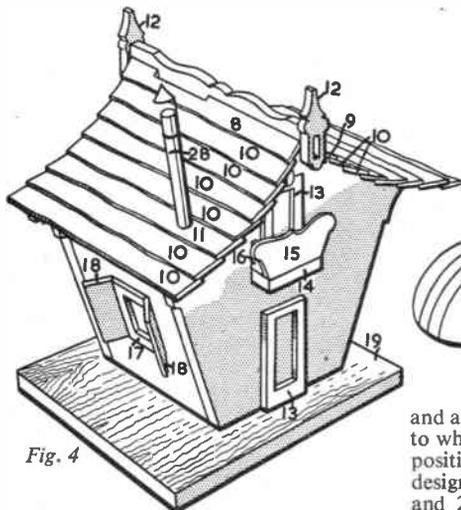


Fig. 4

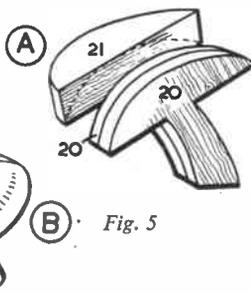


Fig. 5

and a start can be made with the back, 1, to which is glued the two pieces 4 in the positions shown by dotted lines on the design sheet, and as also seen in Figs. 1 and 2. Incidentally it should be noted

not fix them until painting has been completed.

The musical movement is contained in a box made up from pieces 2, 24, 25, 26 and 27, as seen in Figs. 6 and 7. The striker plate of the musical movement should be put through the slot provided in piece 24 when assembling the box. The movement itself is screwed to piece 2 and the positions of other pieces can be seen from the dotted lines on piece 2 on the design sheet.

The assembled parts should now be cleaned up thoroughly preparatory to adding the finish, and the charm of the model will be emphasized by a judicious use of paints. The roof, as stated, should be alternately light and dark wood, or stained to give this effect, and finished with varnish. For the rest of the

house give an overall coat of flat white, and it can then be glued to its base. For this, a crazy paving effect can be employed, using a variety of colours for the individual slabs, such as reds, blues, browns, greys, greens, etc. The slab joints should be lined in white.

The sides, back and ridge of the house should be left white, and the front should be finished in a flat pale yellow. The frames of the doors and windows should be a deep yellow and the balcony a pale blue lined in white. The window shutters can be grey and lined in brown. Roof finials are red with the chimney pipe and cap a dark blue. The large toadstool should be red with white spots and a white stalk, and the small toadstool should have a black top with yellow spots and a white stalk. The small figures at the door, consisting of the pixie and rabbit, should be finished in bright natural colours.

The trellis running up the side of the

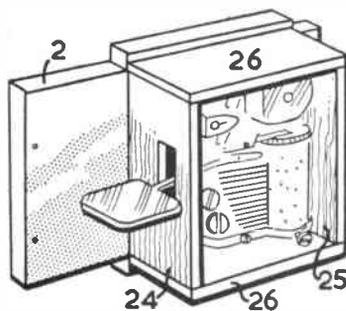


Fig. 6

wall is formed from $\frac{1}{8}$ in. square balsa wood. Glue this to the front in the position shown by dotted lines on piece 3. The climbing rose may be painted on the trellis and wall, or formed from plastic wood squeezed in position direct from the tube and then coloured. The trellis should be white, the foliage dark green

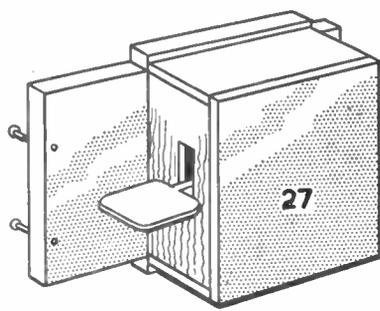


Fig. 7

and the flowers white or pink.

To complete the model piece 2, which includes the musical movement box, is refitted into the back and held in place by four round-headed screws into pieces 4. This section has to be unscrewed and removed to collect the money which has been saved.

Making a Dowel Marker

HAVING a considerable amount of dowelling to do, and tiring of the conventional way of marking off each dowel position with a pencil and set-square, I made the small gadget described here.

This instrument can be used for marking drilling points on any size section of wood for one or two dowels within its range without any measuring of any sort being necessary. It consists of a plate working along a slide, and more than one stud can be added to the slide if more than two dowels are needed. If the occasion arises when the slide is not long enough, the stud and slide have to be used independently.

As an example of its use, the two

pieces of wood in Fig. 1 are to be dowelled together. The size of dowel is decided, the marker centres are adjusted and then placed as accurately as possible in the position shown. The two pieces of wood are then lined up and pressed together. The points are now marked. It is then only necessary to drill and insert the dowels to complete the joint.

The two parts (Figs. 2 and 3) must be carefully marked out and cut from thin tinplate, making sure that both are smooth and free from dents and burrs, especially if they are cut from any discarded household tin. Holes for the studs are then drilled in each part and a short length of stout wire about $\frac{1}{2}$ in. long is inserted and soldered in position,

making sure it is at right-angles. The wires are then cut down to the correct height of $\frac{1}{8}$ in. with a small hacksaw blade at top and bottom to make studs.

The studs can be filed up to form a flat top or, alternatively, they can be filed to form a point. This, of course, must be done very accurately as the points must line up with one another each side.

It is important to make the very slight spring lip or bend at the end of the slide as shown in Fig. 2. When in use, this lip keeps the dowel marker upright when it is placed in position, thus ensuring an accurate alignment.

Finally, the plate is bent as shown in Fig. 4 and assembled on the slide (Fig. 2). A firm push fit must be made

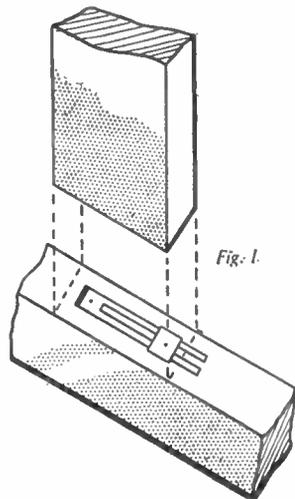


Fig. 1.

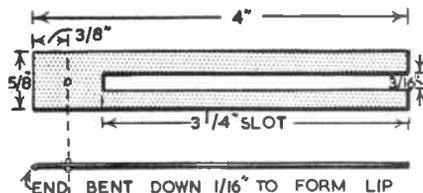


Fig. 2

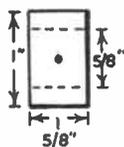


Fig. 3



Fig. 4

PHOTOGENIC KITTENS

A PUBLICATION which will thrill lovers of domestic animals is *Cat's Cradle*. This consists of many brilliant animal shots superbly photographed by Ron Spillman and Jack Ramsay, accompanied by a delightful commentary in rhyme by Paul Dehn.

There is no doubt that the lucky owners of this book will be charmed at the antics of the very lovable kittens and puppy, accompanied at times by an adventurous mouse. They will also wonder how such expressive shots could be obtained and marvel at the supreme perfection of timing. We can visualize many indoor photographers trying to emulate some of the shots in this very well produced publication which is based entirely on a humorous note.

Published by Longmans, Green & Co. Ltd, 6 and 7 Clifford Street, London, W.1. Price 10s. 6d.

FLAVOURING YOUR SWEETS

FLAVOURING plays an extremely important part in the manufacturing of sweets, and can either make or mar a batch. Without the correct amount and type of flavour, the finest sweet is incomplete.

Flavours differ so much in strength that it is not practicable to lay down any rules regarding the correct amount to use. The quantity is affected by the type of material into which it is put; for instance, sweets that are covered with chocolate will need a stronger flavour than those which have no covering.

There are two main types of flavouring material used for sweet making — essences and oils. Both have a special purpose to fulfil, and if one kind is not available, it is not generally advisable to use the other. The oils are much stronger than the essences and, therefore, a smaller quantity will be required in order to produce the same result.

Oils or essences

Sweets that are boiled to a high degree, such as toffees, are generally flavoured with oils, and for the softer confections, like fondant creams, it is best to use essences.

Different makes of flavours vary greatly in strength and character, and it is always advisable to buy the best. The bottles should be well corked after use, as some types are liable to lose their strength after a while. Almond is an example of this, and should, therefore, be bought in small quantities. Keep the bottles in a cool dry place away from the sun.

It is a bad policy to over-flavour sweets, and this can easily happen when strong oils or essences are used. Peppermint, almond, lemon and orange are of this class, and need handling with care; a few drops too much could quite well ruin what might have been a delicious sweet.

Under-flavouring, too, is another fault to avoid, and is more likely to occur with the weaker essences, such as vanilla. A very little experimenting, however, will soon put this right, and it is a good idea to have a notebook to record just how much flavouring you put into each batch, together with a report on the result obtained.

You can learn far more from the making of a batch of sweets than from pages of written instructions, so we think that you should have a few simple recipes to experiment with.

Fondant cream is probably the best to start off with — it is very easy to make, and you can keep tasting it as you proceed. If the flavour is too weak, you can add a little more and taste again; and if

too strong, more fondant may be added to the batch.

A recipe was given in *Hobbies Weekly*, dated 27th February 1957, and to refresh your memory, or if you have mislaid your copy, here it is again. Put 1½ lb. granulated sugar in a saucepan with ½ pint water and nearly ½ teaspoonful of cream of tartar. Stir until

By *A. F. Taylor*

dissolved, then boil without further stirring to 240°F., and remove from the stove. When the bubbles have ceased, pour on to a clean marble slab or large china platter which has been moistened with cold water.

Cream the batch when it is luke-warm by turning the outside edges over into the centre, and continue until it gets stiffer, and then forms a firm lump of white cream. Cover with a damp cloth to mellow for an hour, then knead it with the hands into a soft creamy ball.

When wanted, it is melted down by putting a little into a cup or jug, and standing it in hot water for a time. Then the flavouring is added drop by drop until the right strength is obtained. For fondant creams always use essence. It is also at this stage that the appropriate colouring is added.

With the weaker flavourings, such as vanilla, from one half to one teaspoonful may be used for each pound of fondant, whereas for peppermint, almond and other concentrated essences, probably only a few drops will be sufficient.

Flavoured toffee

Now let us turn to the other end of the scale and concentrate on the flavouring of sweets that are boiled to a high degree. Here is a very simple recipe for a plain toffee which can be flavoured in an endless variety of ways, and will provide ample scope for your experiments.

1 lb. granulated sugar
4 oz. glucose.

Place in a saucepan and moisten with about half a cup of water, and stir over gentle heat until dissolved. Then boil without further stirring to 300°F, and directly this degree has been reached, remove from the stove. Should the sugar splash up on the sides of the pan, dip a brush in warm water and gently wash down to prevent the syrup from granulating.

It is at this stage that the flavouring is added. The syrup is allowed to cool slightly for a few minutes to prevent the oil from vaporizing before it can be stirred in. Essences can, of course, be used. They will evaporate much more quickly and, therefore, will give a weaker result.

Stir in the flavouring immediately it is added to the syrup, and do it as quickly as possible. It is very important to avoid granulation of the syrup when it has been boiled to a high degree, and the less we disturb it, the better. Therefore, a few quick stirs should be sufficient to mix in the flavouring, but make sure that it is really mixed in, and not left lying on the top.

Pour out into a confectionery frame or shallow tin that has been oiled, and allow to cool, when it can be marked out in squares and broken up when cold.

When making candy that is pulled on a hook, the flavours and also any colours can be added at a later stage. The syrup is first poured out on to a marble slab or platter, and allowed to cool somewhat. Then the flavouring oil is sprinkled over the surface, the edges folded into the centre of the batch, and the whole pulled until it is opaque and stiff.

The constant pulling over the hook allows plenty of time for the flavouring to be well mixed into the batch, and there should not be any patches of extra strength which sometimes occurs with insufficient mixing.

Acid and fruit drops

Tartaric acid is occasionally used for sweet making, and is an essential ingredient for acid drops. First make up a batch of plain toffee from the following recipe:

1 lb. granulated sugar
1 gill water
Pinch of cream of tartar.

Boil this as before to 300°F, and pour out on to a marble slab or platter and, when cooled, sprinkle the batch with ½ teaspoonful of tartaric acid, fold in and pull as before.

Variety can be given to this recipe by adding different flavours to the tartaric acid before sprinkling on the batch. A few drops of lemon oil or essence well mixed with the acid will produce lemon drops or cushions, and in a similar manner we can try orange, lime, blackcurrant, raspberry and many others.

By making a note of everything you do, together with a certain amount of commonsense, you should soon learn the art of correctly flavouring your sweets, and failures should be very rare indeed.

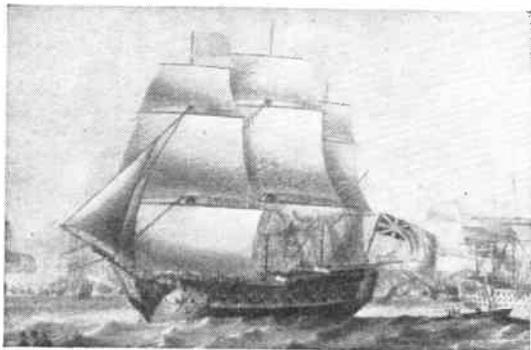
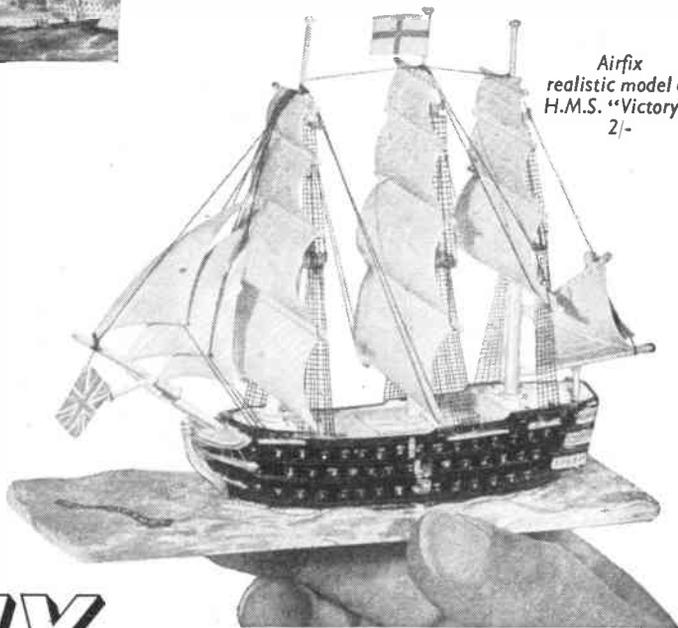


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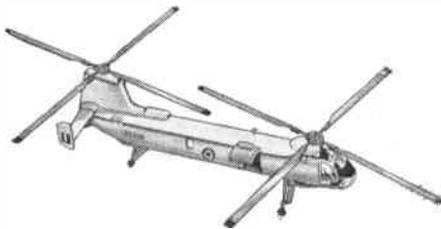
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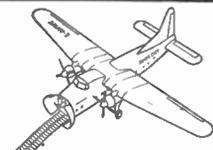
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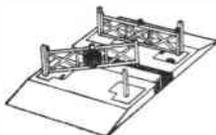


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Experiments with Spinning Discs

WHEN spinning tops became popular as toys, it was seen that the geometrical patterns used to decorate them produced curious optical illusions when the tops were in motion. The effects were in part due to the well-known principle of the persistence of vision. Some of the more striking examples may be studied at home.

Draw the five diagrams shown upon 6 in. diameter circles of stout white card-board. You will need a pen, ruler and compasses, together with Indian ink and a small brush to ink in the large black areas evenly. Cut out the five circles, using sharp scissors.

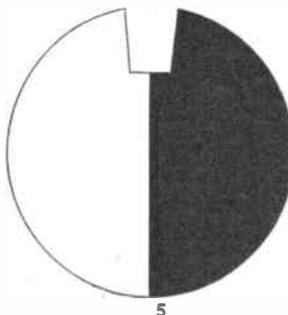
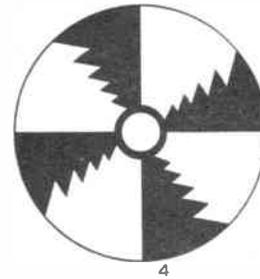
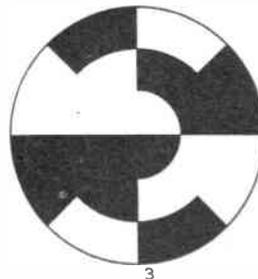
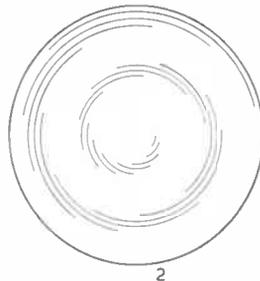
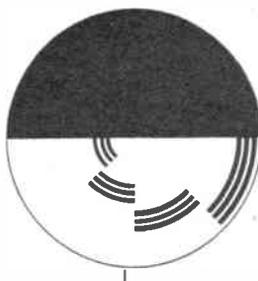
By A. E. Ward

Now you must form your discs into spinning tops. Provide for each a $1\frac{1}{2}$ in. length of $\frac{1}{4}$ in. diameter dowel which is sharpened to a point at one end. Make holes in the centres of the discs and press the dowel spindles securely into position. Place glue around the spindles, on the undersides of the discs, in order to keep the spindles from slipping out. Spin the tops where a good light from a window can fall upon them.

The first pattern was used by David Nixon during his television series, 'It's Magic', when he attempted to transmit impressions of colour via the black and white screen. When you spin the top you will see how this was possible, for you will be aware of four concentric bands of different colours. Change the direction of spin and the same colours will appear, only in the reverse order. Scientists are still baffled by the illusion, though it is thought that the effect may be due to the rate of growth and decay of colour impressions in the eyes and brain.

Pattern number two will produce an intriguing Catherine Wheel effect when rotated anti-clockwise. A similar design, in dark red, kept turning by a gramophone

Next week's issue will contain patterns of things to make as last-minute novelties for the children's Christmas stocking. Also 'Making a Vegetable Rack' for the housewife, and a Crystal Diode Receiver will be among other exciting projects.



a sheet of white paper and then spin the notched disc over it, in such a way that you can view the paper disc through the rapidly moving slot. You will be amazed to see that the red disc has apparently changed to its complementary colour, green.

Complementary colours are those whose vibrations together comprise white light. The bright red colour induces tiredness of the retinal cells at the backs of your eyes. When this happens the optic nerves convey impressions of the complementary colour to your brain. As the notched disc spins, your eyes become tired of the bright red spot and project an impression of the complementary, green, upon the white half of the spinning disc. Since the white area of the disc is far greater than the width of the slot, your brain will be deceived into interpreting the colour of the spot as green.

phone motor has been used to induce hypnosis in a group of people and it may sometimes be seen employed to draw attention to products in shop windows. The effect is due to the persistence of vision, whereby images tend to linger for a fraction of a second on the retinas of our eyes, after the visual stimuli have ceased.

When you spin disc number three you will see three concentric bands of colours which change, in a definite sequence, as the top slows down.

Persistence of vision will explain the illusion of several concentric greyish rings which result when the fourth disc is rotated.

The final experiment with the notched, half-blackened disc (Fig. 5) will provide an illustration of retinal fatigue. You will also require a 2 in. diameter disc of bright red paper. Place the red disc upon

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THE third book in the 'Wings, Wheels, and Water' series for boys by Gordon Allen has just been published by the Gannet Press Ltd., of Birkenhead, at the usual price of 2/6. This book 'Speed on Wheels' deals with most of the well known racing and sports type of car. It is well written, and contains some excellent action photographs which will appeal to any youngster interested in fast cars,

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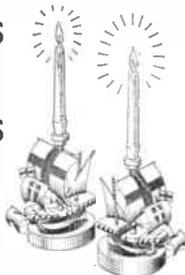
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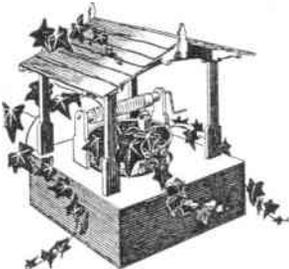
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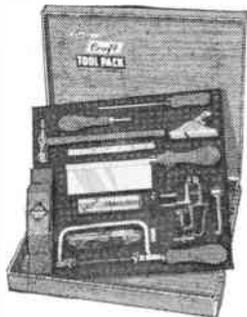
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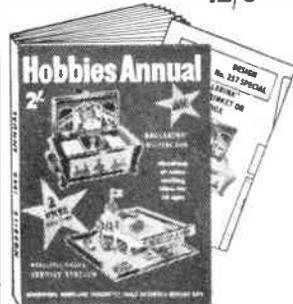
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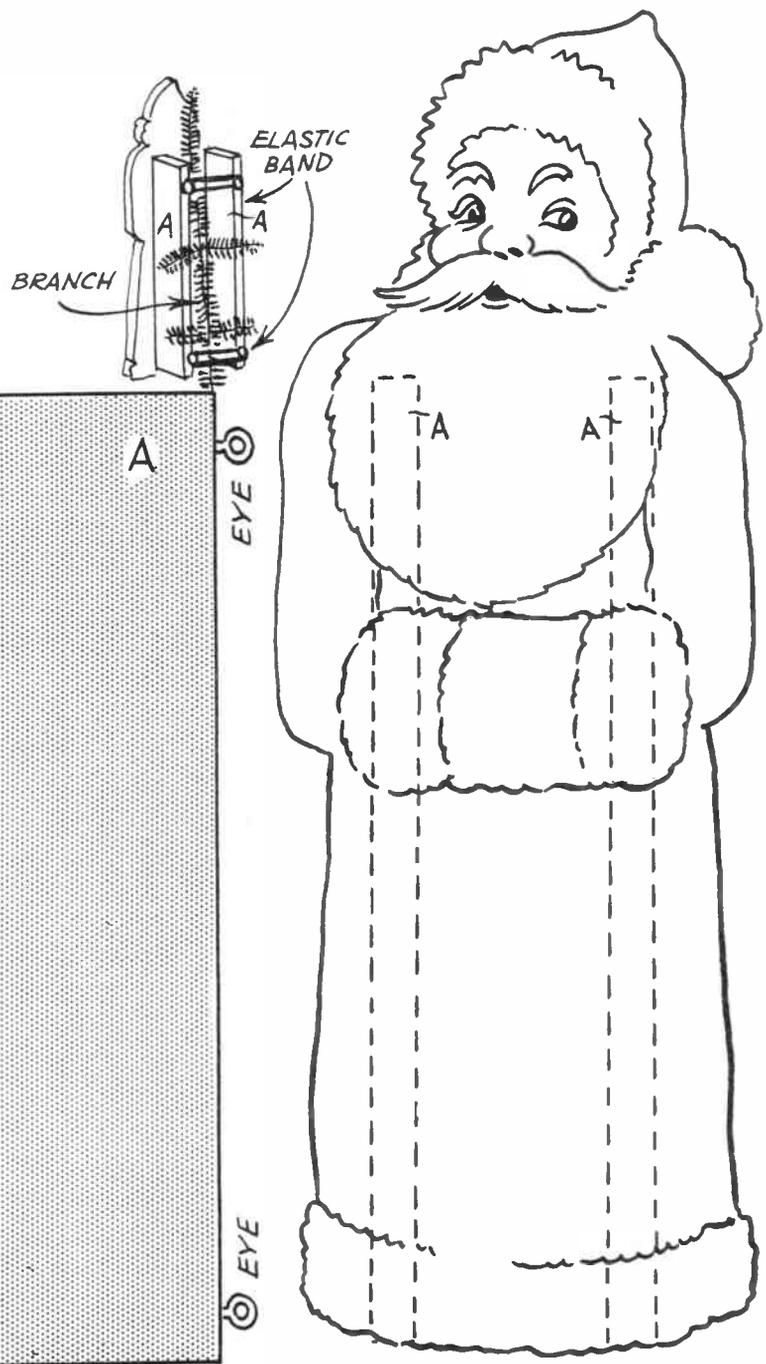
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CHRISTMAS TREE DECORATION

THIS Father Christmas should have the place of honour at the top of the tree. Cut all three pieces from $\frac{1}{4}$ in. wood and glue pieces A at the back of Father Christmas as shown by the dotted lines. Colour with red paint for the coat, white for cuffs and collar, pink for the face, etc. The topmost branch is inserted between pieces A and held in place by two elastic bands stretched across the screw-eyes as shown in the detail.

(M.p.)



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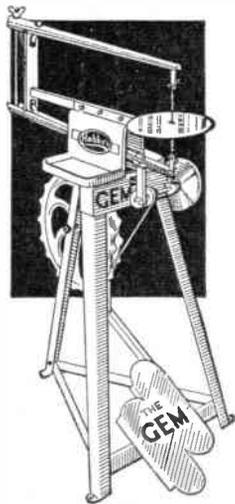
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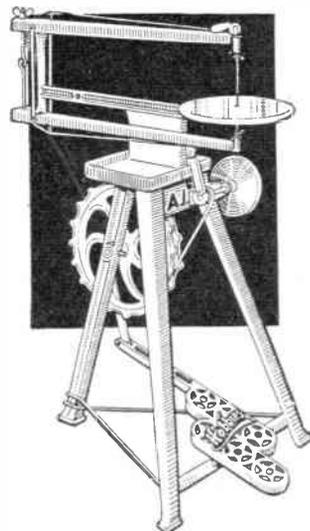
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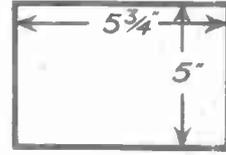
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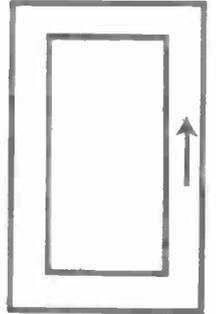
PIECES 26.
CUT TWO 1/8 in.

BALCONY FLOOR 14.
CUT ONE 1/4 in.

PIECES 4. CUT TWO 1/4 in.
GLUE TO
PIECE 1.



BASE 19.
CUT ONE 1/4 in.



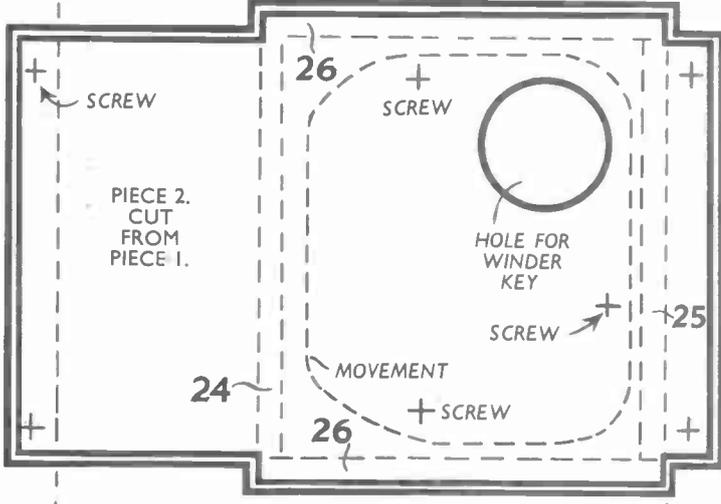
SIDE
WINDOWS
17.
CUT TWO
1/8 in.



TOADSTOOL 23.
CUT TWO
1/2 in.



CUT ONE 1/4 in.



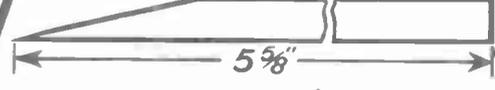
PIECE 1. CUT ONE 1/4 in.



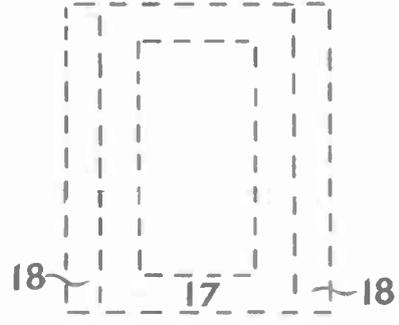
TOADSTOOLS
CUT TWO 1/8
AND GLUE
TOGETHER.

THE ARROWS
INDICATE DIRECTION
OF GRAIN OF WOOD.

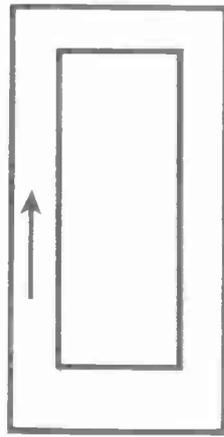
CHIMNEY STACK 28.
CUT ONE 1/4 in. ROUND ROD.



SIDES 5. CUT TWO 1/4 in.
CHAMFER TO SECTION.



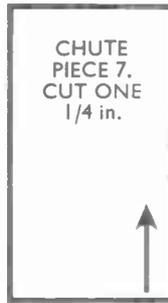
SECTION



DOOR FRAMES 13.
CUT TWO 1/8 in.

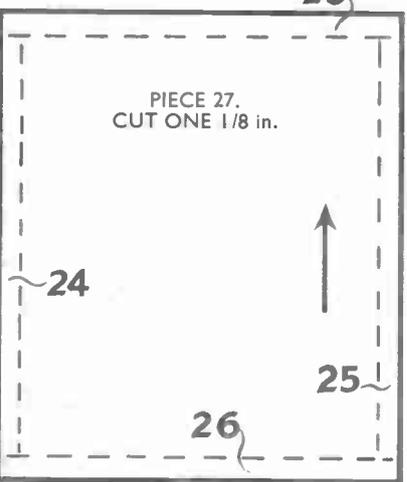


FINIALS 12.
CUT TWO
1/8 in.



CHUTE
PIECE 7.
CUT ONE
1/4 in.

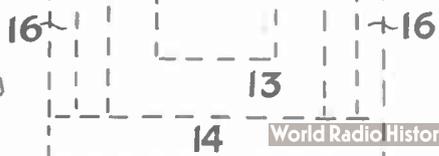
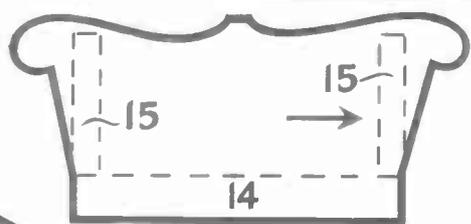
PIECE 27.
CUT ONE 1/8 in.



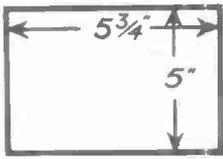
BALCONY SIDES 16.
CUT TWO
1/8 in.



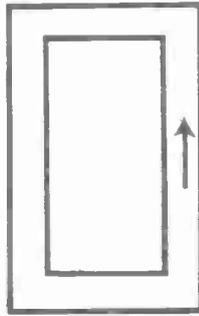
BALCONY FRONT 15.
CUT ONE 1/8 in.



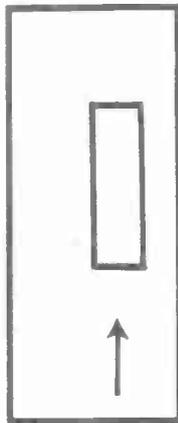
PIECES 4. CUT TWO 1/4 in.
GLUE TO
PIECE 1.



BASE 19.
CUT ONE 1/4 in.



SIDE
WINDOWS
17.
CUT TWO
1/8 in.

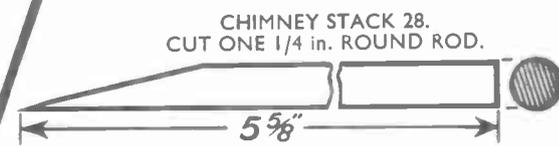


PIECE 24.
CUT ONE 1/8 in.
PIECE 25.
CUT ONE 1/8 in.
TO OUTLINE ONLY.



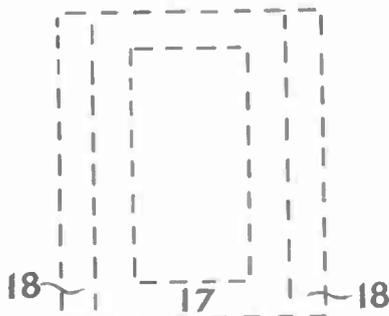
TOADSTOOLS 22.
CUT TWO 1/8 in.
AND GLUE
TOGETHER.

THE ARROWS
INDICATE DIRECTION
OF GRAIN OF WOOD.

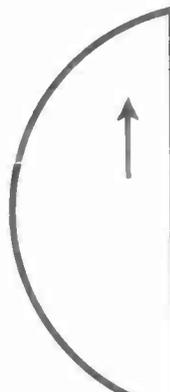


CHIMNEY STACK 28.
CUT ONE 1/4 in. ROUND ROD.

SIDES 5. CUT TWO 1/4 in.
CHAMFER TO SECTION.



SECTION



TOADSTOOL 21.
CUT TWO
1/2 in.

SIZE: 7 in. HIGH, 7 in. WIDE APPROX.

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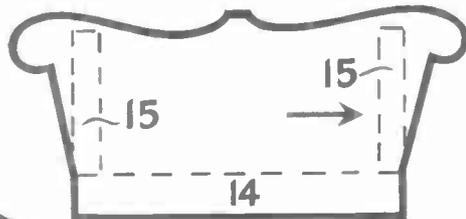


- Mixed & use cold
- Waterproof type
- Gap-filling and non-staining

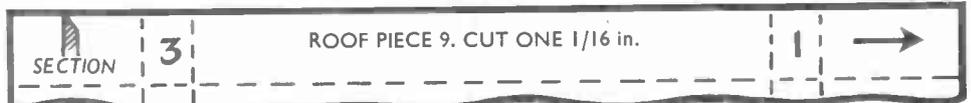
Obtainable in:
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and 18-oz. tins.

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Manufactured by:
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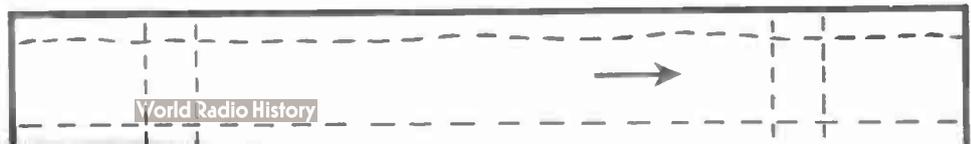
BALCONY FRONT 15.
CUT ONE 1/8 in.



ROOF PIECE 9. CUT ONE 1/16 in.



ROOF PIECE 8. CUT ONE 1/16 in.



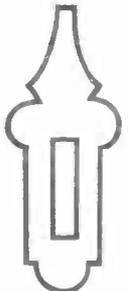
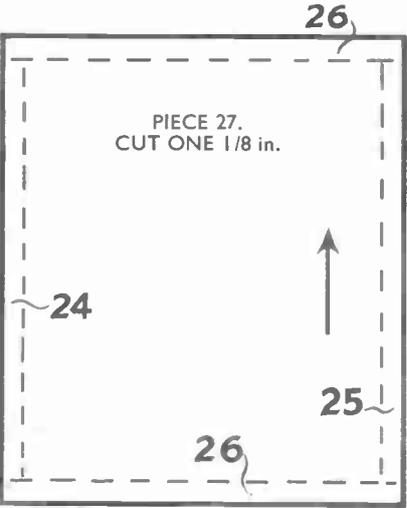
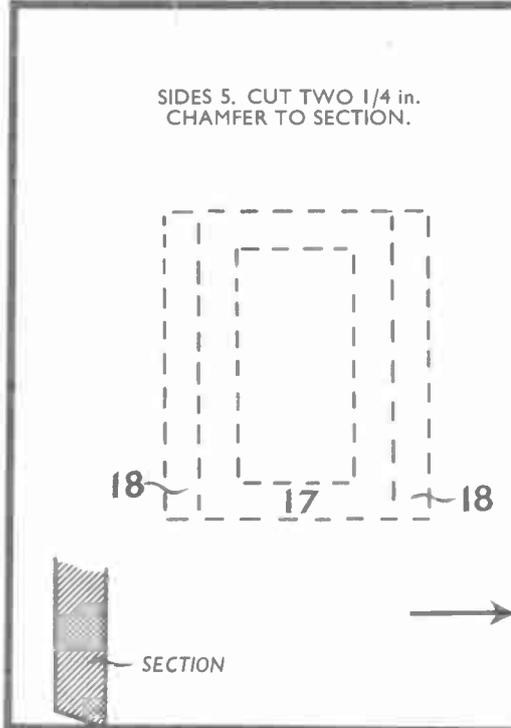
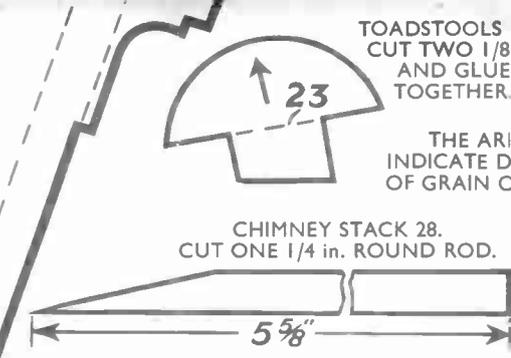
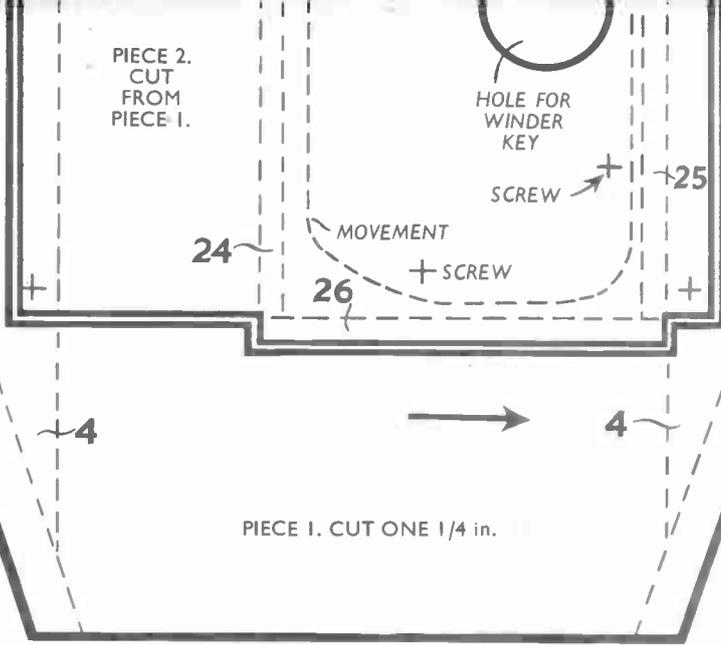
THE PIXIE HOUSE MONEY BOX

(WITH MUSICAL MOVEMENT)

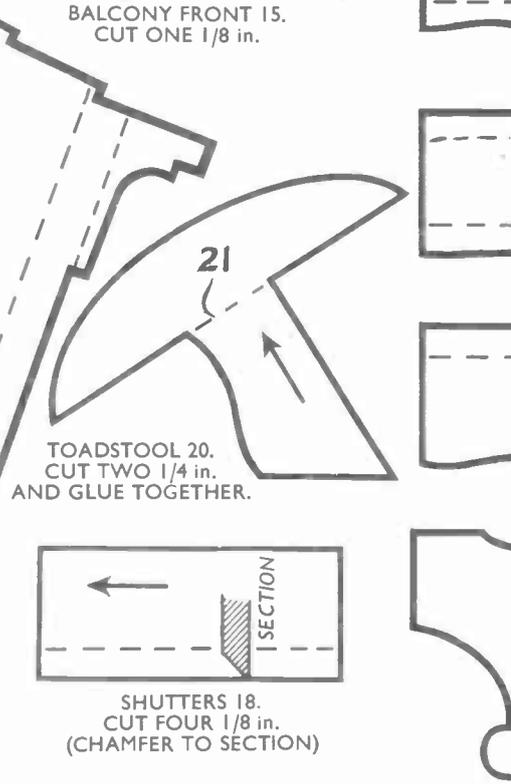
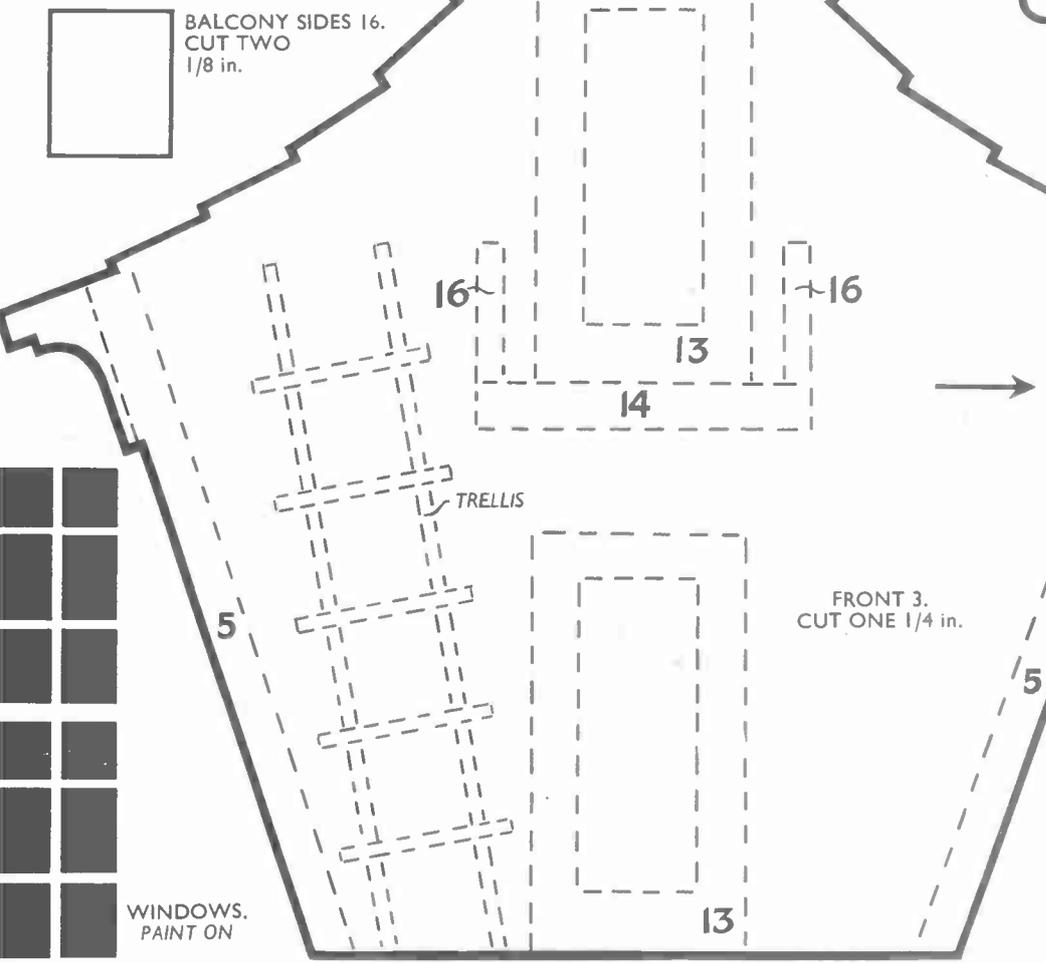
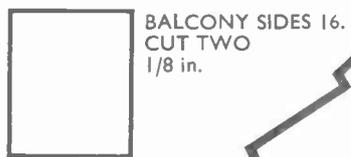
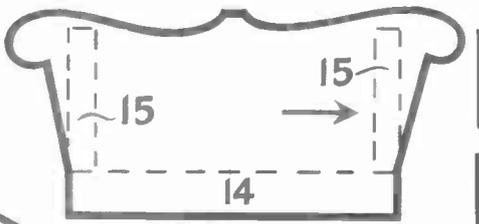
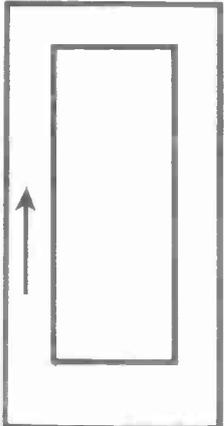


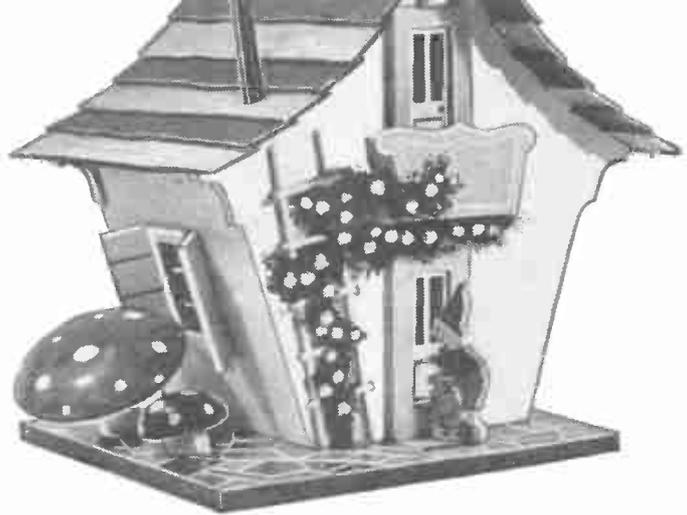
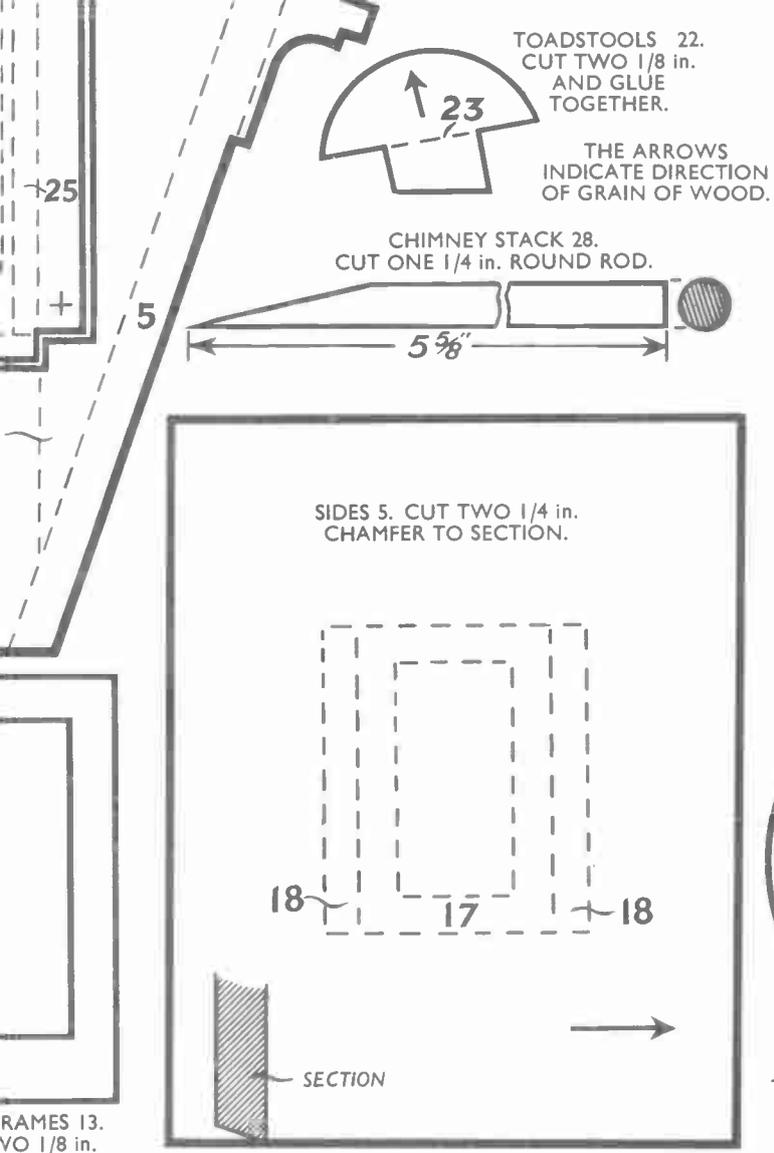


CUT ONE 1/4 in.



FINIALS 12. CUT TWO 1/8 in.





SIZE: 7 in. HIGH, 7 in. WIDE APPROX.

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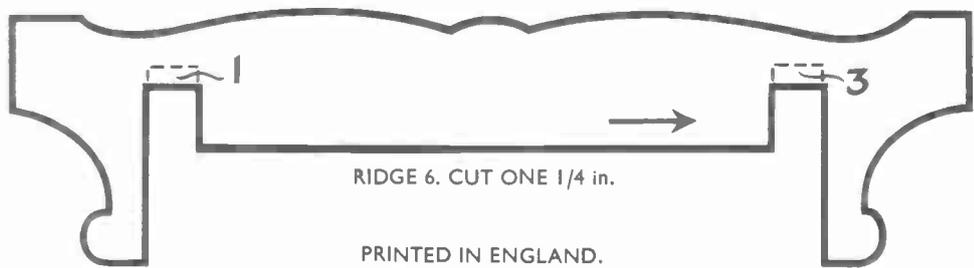
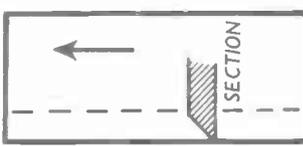
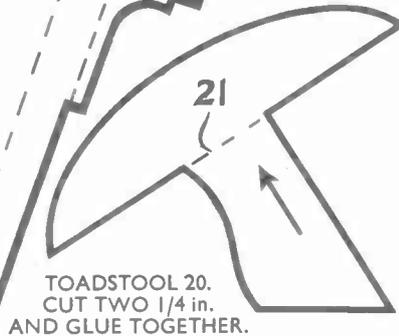
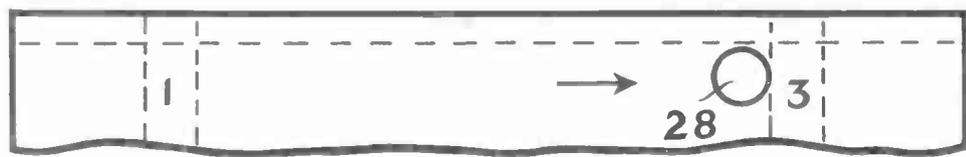
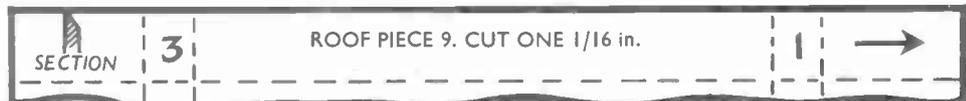
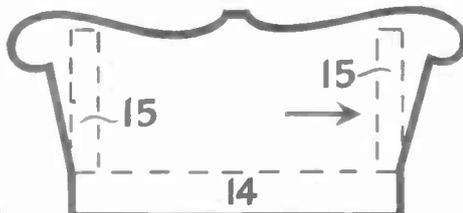
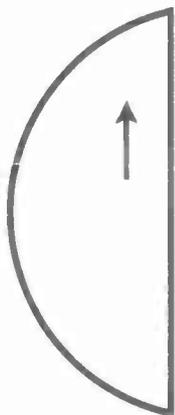


- Mixed & use cold
- Waterproof type
- Gap-filling and non-staining

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

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