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THE ORIGINAL  
'DO-IT-YOURSELF'  
MAGAZINE

# HOBBIES *weekly*

FOR ALL  
HOME CRAFTSMEN

★ *FREE plan  
to make . . .*

*Also in this issue:*

COLLECTING AND  
MOUNTING INSECTS

COLLECTORS' CLUB

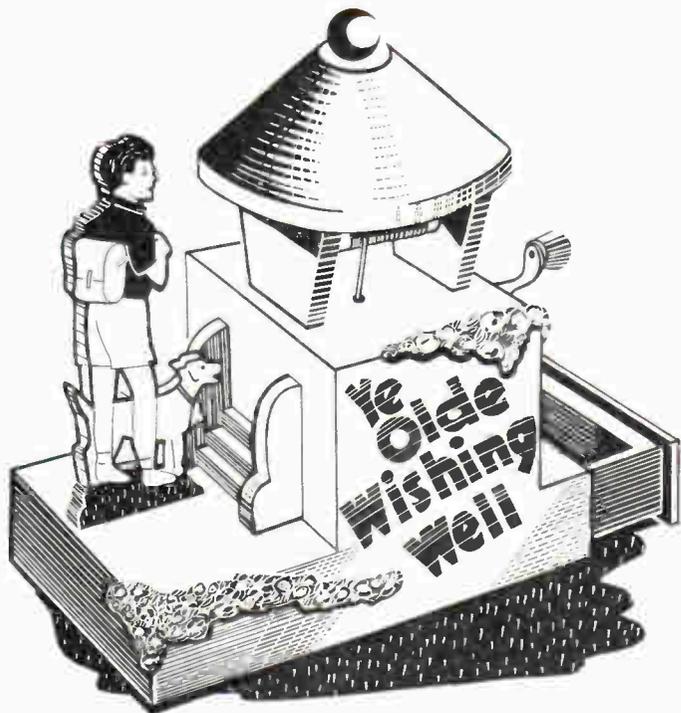
PHOTOGRAPHY AND  
CHEMISTRY

STEAM-DRIVEN  
TOY JET PLANE

HAVE FUN WITH  
STICK PRINTING

SOME READERS'  
PROBLEMS SOLVED

ETC. ETC.



## TRINKET BOX



*Up-to-the-minute ideas*

*Practical designs*

*Pleasing and profitable things to make*

World Radio History

5<sup>D</sup>



**T**HE year is 1828. Pioneer Canada is experiencing a period of progress and prosperity following the unsettled years of the War of 1812. In the frontier village of London, Canada West, there is the clang and hustle of industry as new homes and businesses arise amidst the tree stumps.

## THE SIGN OF THE BREWER

In the centre of that bustling community a log-built brewery opened its doors for customers, establishing the business which grew into the John Labatt Limited of today.

John K. Labatt was 29 years old when he and his bride left their home in Ireland, and settled near London to carve a future in the New World. He entered into a partnership with an experienced brewer named Samuel Eccles, and together they operated the brewery until 1853. That year John Labatt I became sole owner, and gave the company the family name which has continued to this day.

The founder died in 1866 but his son, John Labatt II, himself an experienced brewer, continued to build the company, and the fame of its products spread across the world.



The brewer in the early days chopped a branch from a nearby tree, and stuck it in the ground in front of his place of business. This was a signal to the aleconner that another brew was ready for his approval before going on sale. Gradually the branch became an ale-stake, and as flagstone walks appeared, the signal was more often stuck out from the front of the building. This also became a sign to patrons that a new brew



*These 'Cosmic Space Research Covers' have just been issued by Czechoslovakia. The 30h. stamp depicts the third Soviet artificial earth-satellite. The 60h. shows Soviet artificial satellite of the Sun, and the 1.60 kcs. a Soviet automatic interplanetary station*

More facts for your album.

Throughout England of the thirteenth century, not only was the price of ale fixed by Royal orders, but also its strength and quality. Brewers were required to submit a sample of each brew to the experienced taste of the aleconner.

These important and popular officials were appointed annually by the courts in every manor, borough, and town corporate.

would soon be ready and enterprising brewers started hanging colourful cloth and painted boards on the ale-stake, the better to attract their clients.

And so developed the hanging signs which have become traditionally linked with brewers, taverns, and inns.

## NAMES TO NOTE

Here are some more names for your pen friend list —

SUSAN ELLIS, 27 Broomhill, Dartford, Kent. Age 14. Stamps, and labels.

A. NICHOLS, 2 Oaklands West, Alnmouth Road, Alnwick, Northumberland. Age 14. Fretwork. Cigarette packets.

DAVID LONG, 31 Downbank Avenue, Barnehurst, Kent. Age 14. Fretwork. Fishing. Match labels.

ROY HARRIS, 217 Mill Road, Deal, Kent. Age 14. Chess. Cricket. Radio. Stamps.

DOUGLAS SNELL, 'Abercorn', Westlands Road, Rothesay, Bute, Scotland. Age 12. Stamps.

A. S. KOLHE, Clerk, B. S. R. T. Corporation, Khandesh Division, Divl. Offices, Dhulia, Maharashtra State, India. Toys. Paper crafts. Decorative motifs.

# COLLECTING AND MOUNTING

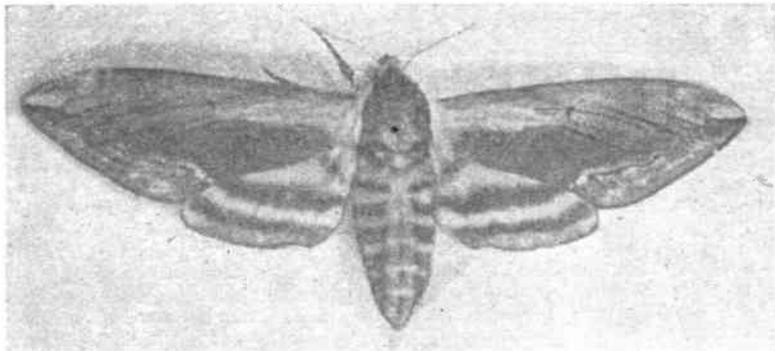
COLLECTING butterflies and moths can be a most fascinating and instructive hobby, but it should be emphasized at the start that such a collection ought to be an aid to the study of these beautiful insects. Killing them indiscriminately is to be deplored.

Of course it is possible to buy mounted specimens of butterflies and moths at dealers, and although this may be justified if the collector wishes to acquire a rare or tropical specimen, he will get far more pleasure and satisfaction from doing his own hunting. Also the purchase of specimens can turn a hobby costing practically nothing into an expensive one.

The first essential for collecting is of course a net. The simplest method of making one is to obtain about a yard length of flexible cane. Thin canes for cleaning out drains and sinks are often sold by hardware shops, and are quite cheap. Failing this, stiff wire could be used, but it bends easily. The two ends should be bound together with twine or wire and suitably fastened as shown in Fig. 1 to a length of  $\frac{1}{2}$  in. wooden rod (about two or three feet). The net itself consists of a piece of nylon curtain net 1 yard by 18 in. sewn together at the narrower sides and the bottom to form a bag. The open end is turned over the loop and sewn to it. No doubt a mother, wife, sister or lady friend could be persuaded to assist with this operation.

### The killing bottle

When an insect has been caught and it has been decided that it is a suitable



PRIVET HAWK MOTH

specimen for the collection, it must be painlessly killed. To do this, a 'killing bottle' is used. This can easily be made from a wide mouthed pickle jar, with a screw cap. One of the best materials for killing is potassium cyanide, but as this is a deadly poison, it is not easy to obtain, and in any case its use would not be wise unless one is experienced in handling it.

However, crushed laurel leaves produce small quantities of hydrogen cyanide which is sufficient for the dispatch of insects, without danger to the collector, and some of these, chopped up, may be placed in the bottom of the jar and covered with a piece of blotting paper to keep them in place.

Alternatively, carbon tetrachloride may be used. Some household cleaners for stains on clothes (such as Thawpit) consist largely of this and are suitable.

A wad of cotton wool should be soaked in the liquid and placed in the bottom of the jar and similarly covered with blotting paper to prevent the insects from becoming entangled in the wool.

With the butterfly in the net, the open jar is inserted and placed over the insect, which is then gently shaken into the jar. The latter is removed and the cap screwed on. Several captures can of course be collected in the jar, and by the time the collector has arrived home, they should be quite dead. The killing agent should, of course, be replaced before it is exhausted.

### Mounting

To mount the specimens, a setting board is required. This can easily be made at home from a piece of balsa wood about 12 in. long, 2 in. wide, and  $\frac{1}{2}$  in. thick. A groove about  $\frac{1}{4}$  in. wide and deep should be cut down the middle, as shown in Fig. 2. The insect is taken and a pin passed through its thorax (the part just below the head). Special entomological pins may be purchased, or thin dressmaker's ones can be used. Of course larger insects will need longer pins.

The butterfly is then pinned to the groove of the setting board so that its wings are level with the top of the board. A 'setting needle' should be made by inserting a thin sewing needle, head first, into a cork, and by its aid the wings and antennae can be arranged in a natural manner.

Pins are inserted into the board against which the antennae may rest and the wings are secured by means of strips of thin paper pinned down, Fig. 3. This requires quite a bit of patience, but the time is well spent since the final appear-



FIG. 1

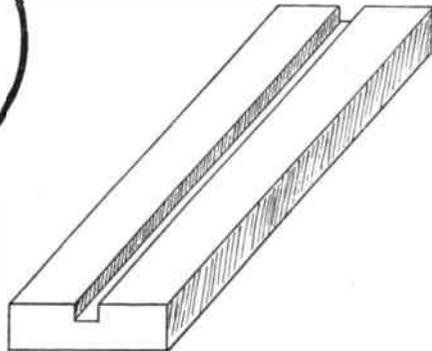


FIG. 2

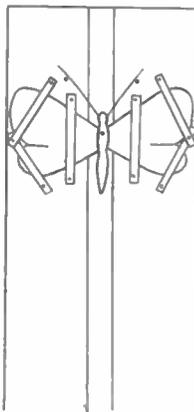


FIG. 3

• Continued on page 100

tab evenly on the paper to know if you could wish to make some pl... mitter? (R.F. — Wolverhampton.)  
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# Replies to Readers

...ivity is a brush point...  
 Y. and 15V (more)  
 to charge a 12V. battery, as c... board over a stou

## Interference from Record Player

**I** HAVE a 'Cub' record player and the motor is a 6 volt D.C. run by 4 U.2. 1½ volt dry battery. Is there any way of fitting a suppressor, as when switched on it shows interference on the TV, and also when plugged in on the output of the radio? (H.M. — Tongham).

**C**LEAN the commutator and brushes, if necessary, with a clean cloth just moistened with petrol. Do not use abrasives or lubricate. If excessive sparking does not arise here, a suppressor condenser of about 1µF may be wired from each brush to earth (metal frame). Leads must be as short as possible. A further condenser, in parallel with the battery input circuit at the motor, may also help. Complete suppression is not easy, but no trouble should remain if the player is kept at a little distance from the receiver.

## Battery Charger

**I** HAVE an Ekco wireless eliminator No. 2 A.10. with an output of 150 and 60 volts. Is it possible to convert to a 12 volt car battery charger. (R.W. — York).

**T**HE eliminator current output will be much too low for charging purposes. The simplest charger for AC mains is a transformer, with rectifier wired to its secondary. A meter may be added in one lead to show charging current. A variable resistor, or transformer tapings, can be used to adjust charging rate, etc. Radio Supply Co., 29-31 Moorfield Road, Leeds 12 can supply all components required, or a kit of parts. Cost of the latter is from 24s. 9d. upwards, according to features and output.

## Axial Flow Fan

**I** NEED to construct an axial flow fan of about 3 ft. in diameter, and I want the fan to operate with a high output at approximately 500-800 R.P.M. Could you advise me on the thickness of metal to use for the blades, also the pitch of the blades and the general shape of same? (J.S. — Broxton).

**A**N ½th H.P. motor would be about the smallest for the purpose you mention. It should be of the type intended for fans, as high speed motors will run too fast, and may be too noisy. If you obtain detailed leaflets issued by various ventilator fan makers, these

will give you a good idea of power, form of construction, etc. If a really high volume of air is required, the motor would be appreciably larger. The blades are usually of mild steel, or a strong aluminium alloy. The slightly concave shape adds strength. About 5 in. wide at the widest part, tapering to about 1½ in. to 2 in. at the axle, should be suitable. The pitch should be such that the motor is fully loaded when running normally. If too great, the motor will run hot. Makers include: Greenwoods & Airvac, Beacon House, Kingsway, London, W.C.21; London Fan & Motor Co., 27 Brecknock Road, N.7.

● Continued from page 99

# BUTTERFLIES AND MOTHS

ance of the specimen depends upon the care taken at this stage.

Of course, if many insects are to be set, more than one board will be required, and when the boards are filled they should be put away in a dry place for about a fortnight, when the specimens will be ready for the collection, after careful removal of the paper strips.

## Storage

The best way to store a collection of butterflies and moths is to use shallow trays with a glass cover and a layer of cork, covered with paper, at the bottom, so that the pins may be inserted easily. These can be made up from wood or cardboard and the glass cover may be hingled with Sellotape. Cork table mats may be cut up for the bottom covering. A suitable size for the boxes is about 10 in. by 15 in. A small piece of camphor or a moth ball should be glued to one corner to discourage mites and other harmful insects. Each specimen should be labelled, giving details of the locality of capture and the date. The cases should be stored in a damp-free place or mildew may attack the specimens.

Moths, of course, can be treated in the same way as butterflies, but if they are fat bodied, a larger groove in the setting board will be needed. Butterflies naturally will be sought in the lanes and fields in spring and summer, but most moths must be hunted at dusk or after dark. Sometimes an obliging insect will enter the living room on a summer's evening, but otherwise they can often be attracted by a hurricane lamp in the garden. (P.R.C.)



"WE'LL GO AND SEE HOW THEY ARE GETTING ON - THEY'RE BOXING IN THE BATH FOR ME."

# CHEMISTRY AT HOME

**M**OST people are unaware that they are well acquainted with benzaldehyde,  $C_6H_5.CHO$ . That small bottle of almond flavouring in the kitchen contains a small amount of benzaldehyde as its active principle. We know, then, that this compound has the odour and flavour of almonds and is non-poisonous.

It occurs in oil of bitter almonds, and also in the leaves of the cherry-laurel, the cherry, and of the peach. Oil of bitter almonds consists mainly of benzaldehyde and some of the oil is still made for pharmaceutical and flavouring purposes. The benzaldehyde one buys from laboratory furnishers is a synthetic product.

## EXPERIMENTS WITH BENZALDEHYDE

This highly refractive liquid is slightly soluble in water. Shake a drop with some water in a test tube, and then separate the water from any undissolved benzaldehyde. Although it dissolves only to the extent of one part in 300 parts of water, you will note that the solution has a strong odour of almonds.

Put a few drops on a watch glass, and leave aside for a few hours. Crystals appear, and the benzaldehyde eventually disappears, the whole becoming solid. The oxygen,  $O_2$ , of the air has oxidized the benzaldehyde to benzoic acid,  $C_6H_5.COOH$ :



From this fact it follows that the compound must be carefully stored, if it is not to oxidize entirely to benzoic acid. In fact, a bottle of benzaldehyde soon shows benzoic acid crystals on the surface of the liquid. Tight corking is not enough to stop oxidation, for every time the bottle is opened a new supply of oxygen is admitted. There is an easy means of stabilization. The addition of either 0.15 gram of hydroquinone (quinol, or para-dihydroxybenzene),  $C_6H_4(OH)_2$ , or of its isomer catechol (ortho-dihydroxybenzene),  $C_6H_4(OH)_2$ , to each 100 gram of benzaldehyde will prevent this oxidation.

When treated with a strong solution of sodium bisulphite,  $NaHSO_3$ , benzaldehyde forms a crystalline bisulphite

compound,  $C_6H_5.CH(OH)SO_3Na$ :  
 $C_6H_5.CHO + NaHSO_3 =$



This reaction is often used to separate benzaldehyde from other compounds. To 6 c.c. of a freshly prepared strong solution of sodium bisulphite add 1.8 c.c. of benzaldehyde, shake thoroughly, and let the mixture stand. Note that the benzaldehyde dissolves at once. After a few hours the mixture becomes almost solid due to separation of the white bisulphite compound. Filter this off with the aid of a filter pump, and press well. Allow it to dry at room temperature.

Now let us see what happens when we treat it with sodium carbonate solution,  $Na_2CO_3$ . Put a little in a test tube, add a few c.c. of sodium carbonate solution, and warm gently. Smell at the mouth of the tube. A strong odour of benzaldehyde will be noted, and you will see droplets of it have formed in the liquid. The benzaldehyde has, therefore, been regenerated:

$2C_6H_5.CH(OH)SO_3Na + Na_2CO_3 =$   
 $2C_6H_5.CHO + 2Na_2SO_3 + CO_2 + H_2O$ ,  
 sodium sulphite,  $Na_2SO_3$ , carbon dioxide,  $CO_2$ , and water,  $H_2O$ , being simultaneously formed.

When acted upon by a strong solution of ammonia,  $NH_3$ , benzaldehyde is converted into crystals of hydrobenzamide,  $(C_6H_5.CH)_3N_2$ :  
 $3C_6H_5.CHO + 2NH_3 =$   
 $(C_6H_5.CH)_3N_2 + 3H_2O.$

To prepare a specimen, put 5 c.c. of benzaldehyde into a bottle or small flask, and add 25 c.c. of strong ammonia (of specific gravity 0.88). Close the vessel with a rubber stopper, and tie it on securely. Shake vigorously for a few minutes. An unstable emulsion forms. After about an hour granular white crystals of hydrobenzamide begin to appear, and gradually increase. Allow the whole to stand about three days, with occasional shaking.

Filter off the crystals and wash them on the filter with small quantities of water until one wash water is shown to be no longer alkaline by not turning red litmus paper blue. Allow the crystals to dry.

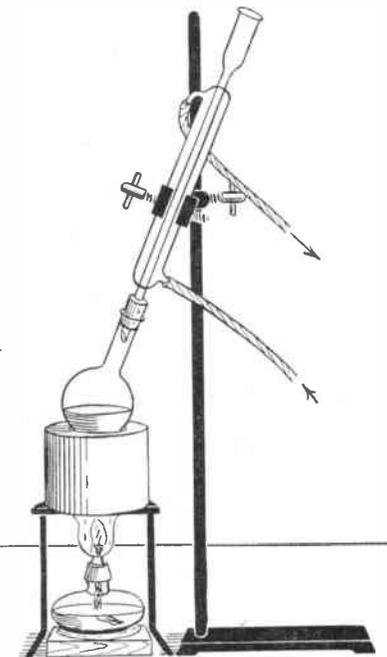
To purify them they may be recrystallized from boiling methylated spirit in the apparatus shown in the diagram. Put the compound in the flask, and add small quantities of methylated spirit down the condenser, allowing each quantity to boil by the heat of the water bath before adding more. When all the crystals have dissolved, extinguish the flame and pour out the solution into an evaporating dish. On cooling and standing, granular white crystals of hydrobenzamide separate, and may then be removed and dried on a porous tile.

Aniline,  $C_6H_5.NH_2$ , also reacts with benzaldehyde, benzylidene-aniline (which is also known as benzal aniline),  $C_6H_5.CH:N.C_6H_5$ , being formed:  
 $C_6H_5.CHO + C_6H_5.NH_2 =$



To prepare the compound, put 10 c.c. each of benzaldehyde and aniline into an evaporating basin. Heat the basin on a boiling water bath for an hour. The mixture, which is at first cloudy, clears, and on cooling a mass of needles separates. Filter off the needles, preferably with the aid of a filter pump, press down well, and wash with a few c.c. of methylated spirit.

The benzylidene-aniline may now be purified by recrystallization from methylated spirit in a similar apparatus rig to that used for hydrobenzamide, shown in the diagram. In this case put the crude compound into the flask together with 20 c.c. of meths., and when the solid has dissolved, extinguish the flame, disconnect the condenser, and pour out the



Recrystallizing hydrobenzamide

● Continued on page 102

# Steam-Driven Toy Jet Plane

**M**AKING a toy jet-propelled aeroplane which really works will provide a splendid one-evening project for a boy. The little model is driven by a narrow blast of steam and the design of the toy is inspired by the first jet motor in history, invented by Heron of Alexandria, 2,000 years ago. You will need a tin with a press-on lid, some aluminium foil, a small cork and a cotton reel. Also supply yourself with a thin piece of glass tubing about 10 in. long and a 2 in. length of somewhat wider bore tubing. The thin tube should fit snugly, but not tightly, into the thicker tube.

Select a  $\frac{3}{4}$  in. tall cork which is not too thin and bore a hole through its middle, from end to end, into which the wider of the glass tubes will fit tightly. Use a nail and file to make a large hole in the centre of the tin lid, which will later receive the cork. Round off the rough edges at the ends of the short tube by holding the glass at the top of a hot Bunsen flame whilst rotating the tubing in your fingers. Be careful not to allow the ends of the tube to close in. When the glass is cool, press the tube through the cork and mount the cork in the tin lid, as illustrated.

Now for the most difficult part of the construction. Bend the narrow tube through  $90^\circ$  at a point 3 in. from one end. To do this, hold the glass in a

Bunsen flame, supporting it between both hands, whilst you gently rotate the tube between your fingers. When the glass begins to glow red hot let the shorter 'arm' of the tube fall slowly through the required angle. Wait until the glass is cool before employing the same technique to bend aside the opposite end of the tube through  $90^\circ$  in a plane at right angles to the first bend, at a point 1 in. from the opening of the tube. The diagram will make these instructions quite clear.

Round off the end of the longer arm of the thin tube in the manner already described. Narrow the opening of the shorter arm by heating the end until the glass softens and begins to close over. The aperture of the completed 'jet' tube should be about  $\frac{1}{16}$  in. in diameter. Fit a cotton reel which has been scraped clean of its paper labels upon the wide bore glass tube, then fit the longer arm of the thin tube through the hole in the cotton reel and into the wide bore tube. The purpose of the wooden bobbin is to provide a reliably smooth rest for the rotating tube when the toy is working. Failure of the tube to rotate easily will spoil the whole project.

Cut a little silver aeroplane out of aluminium foil. Fold the material before you begin cutting, and you will be able to obtain a pleasingly symmetrical shape.

You should base your design upon the shapes of modern supersonic fighter planes. Cut two small slots across the 'centre fold' of the aeroplane and proceed to mount the model upon the short jet tube. Naturally, the aperture of the jet will be to the rear of the aeroplane. Try and obtain a pair of minute R.A.F. insignia to stick on to the wings. One-third fill the tin with water and replace the lid. Heat the water by standing the tin upon a gas ring or support it over a Bunsen burner. Avoid letting dangerously high steam pressures form inside the apparatus by refraining from heating the tin too furiously.

Soon a high pressure steam jet will issue out behind the aeroplane, and the little model will begin to move forward,

driven by the force of reaction. Some adjustments may be needed before the toy works satisfactorily. An occasional drop of oil in the wide tube will lessen friction between it and the rotating tube, and will also serve to reduce the amount of steam which will escape through the middle of the apparatus. The inevitable escape of some steam in this way will help to prevent high pressures forming inside the tin. A final word — see to it that the jet tube is completely clear of obstruction before starting the toy working.

(A.E.W.)

● Continued from page 101

## EXPERIMENTS WITH BENZALDEHYDE

solution into a beaker to cool and crystallize.

Filter off the yellowish needles, press well, and then let them dry in the air.

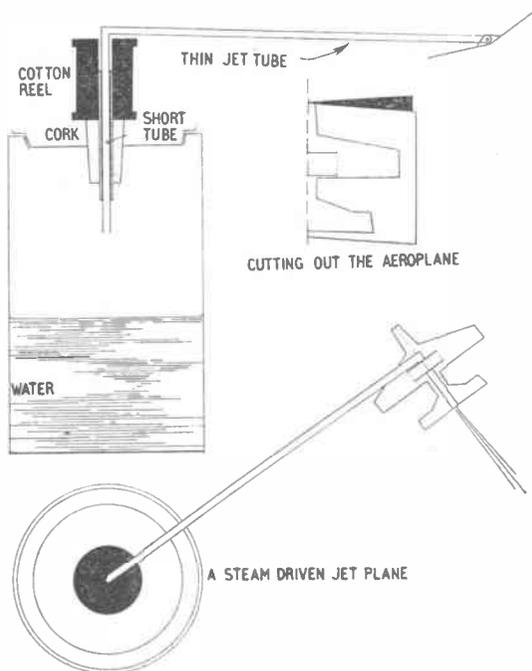
This compound is known as a Schiff's base, and the reaction is typical of the ready condensation of aromatic aldehydes such as benzaldehyde with a primary amine such as aniline.

Another interesting experiment illustrates the Claisen reaction. Into a flask put 4.8 c.c. of benzaldehyde, 1.7 c.c. of acetone,  $(\text{CH}_3)_2\text{CO}$ , and 50 c.c. of methylated spirit. Swirl to mix, and then add a solution of 1 gram of sodium hydroxide,  $\text{NaOH}$ , in 50 c.c. of water. Insert a rubber stopper, and shake well. An emulsion forms. Allow to stand with occasional shaking. The emulsion gradually thickens, and granular yellow crystals begin to separate.

These crystals consist of dibenzalacetone,  $\text{C}_6\text{H}_5\text{CH}:\text{CH}:\text{CO}:\text{CH}:\text{C}_6\text{H}_5$ , which is formed by the reaction:  

$$2\text{C}_6\text{H}_5\text{CHO} + (\text{CH}_3)_2\text{CO} = \text{C}_6\text{H}_5\text{CH}:\text{CH}:\text{CO}:\text{CH}:\text{C}_6\text{H}_5 + 2\text{H}_2\text{O}.$$

After one hour filter off the crystals, preferably with the aid of a filter pump, and wash with water to remove the sodium hydroxide. When one wash water no longer blues red litmus paper the crystals may be allowed to dry.





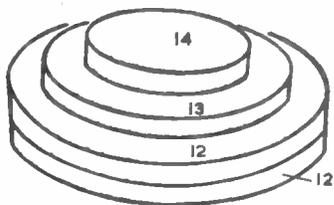


Fig. 5

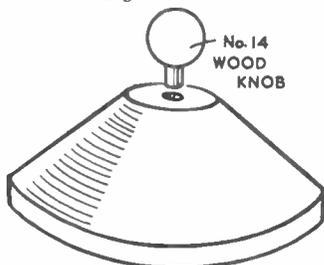


Fig. 6

Next add the steps, consisting of pieces 10 and 11, as shown in the finished illustration, and glue the figure of the boy and dog in the tenon provided in

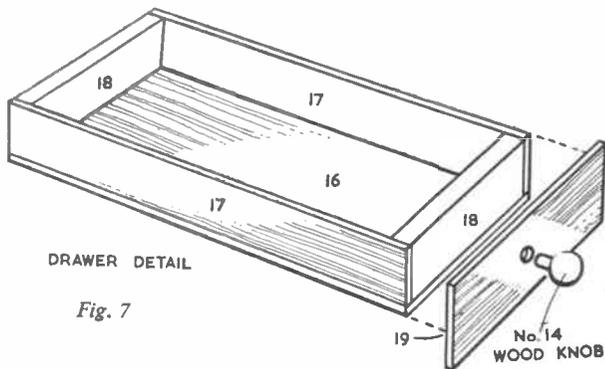


Fig. 7

piece 4. The jewellery drawer is made up as shown in Fig. 7 from pieces 16, 17 and 18 with the addition of the facing piece 19 and another wooden knob. Clean up the finished drawer thoroughly and ensure an easy sliding fit.

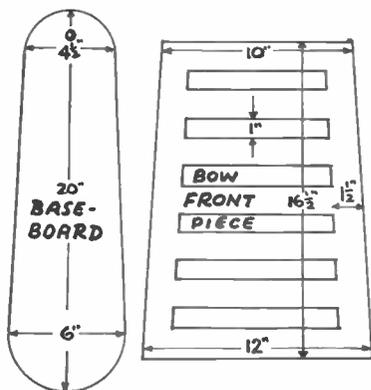
The floral decorations seen on the front of the model can be fashioned from plastic wood squeezed from the tube in layers and shaped with slivers of wood.

For finish, gaily coloured paints are suggested. The wording 'Ye Olde Wishing Well' can be painted on or omitted according to individual capabilities. A colour scheme is suggested on the design sheet for the boy and dog. The handle of the movement is screwed on to the shaft to complete the model, and the tune chosen can be played by turning the handle either way.

## PAN LID HOLDER

**M**OST of us like to keep our kitchens as neat and tidy as possible, but it's a big problem finding a 'home' for all the odds and ends. And, do you find that saucepan lids are 'cluttery'? They never seem to have a place of their own, do they?

Here is a contemporary holder that can be made in an hour or two from materials easily available. As you will see in the drawing the lids just drop into place in the slots, and they are just as quickly removed. The unit has graduated length slots, so that all sizes of lids can be accommodated.



The holder is in two parts. A baseboard is made from  $\frac{1}{2}$  in. thick wood or thereabouts, and a piece of inlaid linoleum is bowed to form the front. You must use inlaid linoleum; the felt base or printed variety will not do.

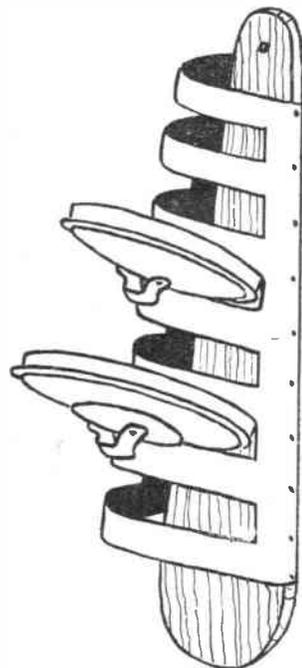
The baseboard is cut 20 in. long; it tapers from 6 in. across the bottom to  $4\frac{1}{2}$  in. across the top. Round off the top and bottom edges if you wish, but do remember to drill a hole near the top, as shown, to hang the unit on the wall. You can, of course, use the holder in a horizontal position on, say, the cabinet top, but it is better to hang it out of the way, on a spare part of the wall.

The front piece of linoleum measures  $16\frac{1}{2}$  in. in length, it tapers from 12 in. across the bottom to 10 in. across the top. The six slots are cut 1 in. wide, and are spaced  $1\frac{1}{2}$  in. apart. They extend to  $1\frac{1}{2}$  in. from the sides. Cut the slots with a sharp knife.

To assemble, tack the sides of the linoleum to the edges of the base board. Nail at about 1 in. intervals, and use  $\frac{3}{4}$  in. long tacks of the blued type that will not rust.

Finish the holder by painting or enamelling. The unit will be used in a steamy kitchen and the paint will preserve it and also serve to harden the soft surface of the lino.

Some workers may prefer to make the



front bow piece from a non-corrosive metal on which any sharp edges should be rounded off. (E.C.)

# STICK PRINTING IS FUN

**Y**OU may have heard of block or stick printing before, but here we introduce an entirely new method using small, square, wooden beads. These are normally used for decorating cork table mats, and have a hole through the centre for the thread. They are ideal for our purpose, since they may be used either on the plain smooth side, or on that with the hole through, permitting variation in the printing. Moreover, if you make a pattern and stick a few of the beads on to a small block of wood, you have a ready-made stamp, but let us see what we can do with the single beads.

You will find that these beads are very cheap, and can usually be bought from any arts and crafts shop, so you should have no difficulty in obtaining them. To use singly for stick printing, knock a fine panel pin into one side to make a small handle. When you wish to use the side with the hole, you may fasten in a match stick. The only other materials required are some drawing paper and colours.

You may use coloured inks, water colours, poster paints, emulsion paint or even distemper, but whatever medium is employed, it is essential to avoid excessive inking of the block. This is overcome by saturating a soft spongy piece of material like flannel with the colour, placing it in an old saucer. The block is inked — merely by dabbing on the pad — and the surplus worked off on newspaper.

You may require other shapes for

printing besides the square wooden beads, so we suggest strips of thin wood varying in length, and smoothed on the printing edge. These will make lines and if you will now refer to Fig. 1, we will explain how this picture was made.

First of all the shape of the tree was sketched out very faintly with a pencil on to a piece of paper, the trunk and

working ends must be smoothed with glasspaper before use.

Fig. 2 was similarly made by sketching out the shape of the girl and using square and triangular beads along with a few sticks. The dress has been decorated with colours, and a belt has been added around the waist, but with a little ingenuity you will be able to design something very similar. The eyes and nose were added with the aid of a rounded stick.

Fig. 3 is entirely different, and shows some examples of small blocks for monograms, patterns or pictures. You will see that we have made a monogram for the initials of T and L. Sufficient beads to form the letters were stuck on small pieces of wood and allowed to dry. Note that it was necessary to prepare the letter L in reverse. You may stick the two letters on the same block of wood if you wish, mottling one of them, but if you want the finished monogram to be in two colours, it is necessary to make separate blocks. The print of the letter L is made first, and on drying, it is overprinted with the letter T in a darker colour. You can make a similar monogram with your own initials for printing on your notepaper. Ensure that the letters are all the same height by placing a sheet of fine glasspaper on the table, and rubbing the block, with the beads downwards.

The pattern in the centre in Fig. 3 is again made from a block. The cat is made from a combination of a small block for the head, with the addition of stick printing for the body and tail.

Always remember that a separate

*By S. H. Longbottom*

branches being stamped in with pieces of stripwood, as described. Next we dotted a few flowers here and there, for this is a flowering shrub, and you will see that they are triangular in shape. In other words, we shaped a bead to a triangle, merely by chopping in half, and then mottled the surface by light hammering with a punch. The flowers were printed in red. Next we printed the foliage in green with the square beads, and there you are.

The advantage of using single beads is that you can see exactly where to print, and this is very useful where you are adding flowers. You may use what colours you like for the flowers, or you may add some fruit to make an apple or cherry tree, but this will call for a rounded stick. We would suggest the end of a pencil, a piece of dowel rod or a portion of a cocktail stick, but the

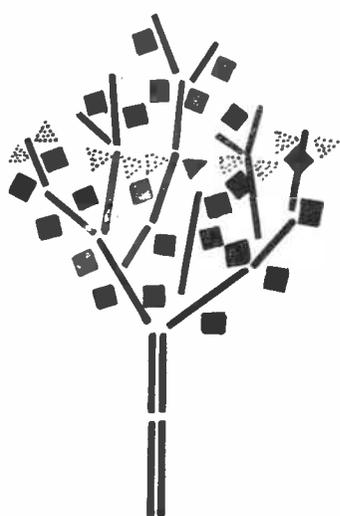


FIG 1

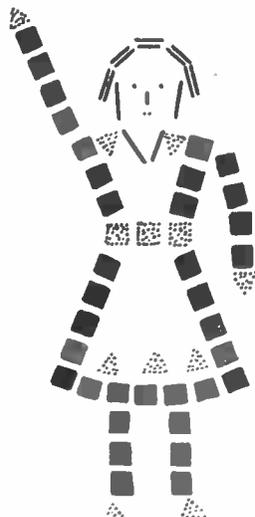
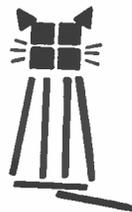
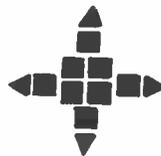


FIG 2



FIG 3



bead or block is necessary for each colour. There are other simple tools we can make, which help us to add original touches to our pictures. For example, if a piece of string is glued on to a piece of wood in the shape of an oblong or square it will make a border for your pictures. You may even twist string into

● Continued on page 106

## Unusual prints

# Another Use for Enlargers

IT always adds interest to a photographic album to include, here and there, the odd, unusual print. It may be a snap with unusual and striking lighting effect, or framing, or a normal subject viewed from an unusual camera angle; or even the simple and sometimes very effective dodge of trimming a

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By E. G. Gaze

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portrait snap by cutting away the surround. You can also make use of your enlarger and a few sheets of spare bromide paper to produce an almost limitless variety of 'unusual prints'.

Normally the negative is in the enlarger-carrier, and is projected on to the baseboard and bromide: the light passes through, is focused by the lens to form the enlarged image on the paper, and you obtain a positive print from your negative on development. Light passes through the clear and transparent sections of the negative according to its opacity. The black portions of the negative hinder or stop light passing through to the paper emulsion and so your highlights or white portions of the print are formed. If, in place of a normal negative with its gradations of transparency, you have an equally thin (it has to be to lie in your negative carrier) object that is opaque, then light will pass around it but not through it — on your paper you can develop an image of its shape. If the object is partly transparent or translucent you will develop a negative image of its shape.

And what sort of objects can you use? Well, that's for you to exercise your ingenuity, either to show something common in an unusual light or maybe to produce unusual pattern prints in an attractive manner. Two examples that came to hand in as many minutes were a pair of postage stamps, and a small cushion feather. Both could lie comfortably in the glass negative carrier, both produce negative images when enlarged and focused on to the enlarger baseboard. Note how enlarging has de-



*A cushion feather enlarged and showing a detailed and attractive pattern*

fined the delicate lines of the feather; how light has passed through the transparent quill-end to define its structure.

Another way to get these negative prints is to place a tumbler or wine glass on the baseboard with the enlarger switched on. Move them about until a pleasing pattern of light and shade is found, or a different approach; place them some way above the baseboard on a sheet of glass so that they also cast shadows on the paper.

Three simple things to hand; a pleasant time at the end of a normal enlarging session in the darkroom; a few prints that might not be worth the keeping, a few that might be so strik-

ingly effective (as the feather print) that you want to go on and experiment more. How would a print of a portrait look with a feather added, framing the subject? I don't know, I'll have to try it — get the idea?

Exposure time? Well, start off with enough to give a good black to the portion of the paper receiving un-hindered light, probably around five seconds, but that will depend on the power of your enlarger lamp among other things.

How would the wing of a dead moth or the common fly look enlarged in negative form: once you start thinking about subjects you'll find plenty!

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• Continued from page 105

## STICK PRINTING IS FUN

letters or shapes, although this requires more patience than with the beads.

You will also find that rubber bands, in varying widths, and vulcanized cycle patching are ideal for making small pictures or initial blocks. In fact they are almost like the rubber stamps we buy. You must remember, however, that your block must always be in reverse, but you should have no difficulty in this respect, if you draw your letters or picture on the protective backing of the vulcanized patching, cutting out with a sharp knife or a pair of scissors. Letters are, perhaps, more easily made by cutting the

patching into narrow strips, and then carefully joining together.

Cork stoppers also make handy little stamps, being very easy to work, but you will find that it is essential to use a very sharp knife to obtain clean cuts, or you will make a ragged untidy block.

Circles can be made from anything which is tubular, such as the metal part of a penholder removed from the wooden handle, while bottles will make larger circles if required. Dowel rods, pencils, and cocktail sticks will make rounded shapes of all sizes.

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# The Highland 'Small Ben' Class

THE first locomotives designed by Peter Drummond for the Highland Railway were a series of twenty 4-4-0 inside cylinder passenger engines known as the 'Small Ben' class. They first appeared in 1898, and the accompanying table gives the full details.

These engines were a very neat design and rather elegant in appearance, proving extremely popular with the H.R. enginemen. For many years they were employed on the Inverness-Wick section, where they proved most successful and economical in working. When they were taken over by the L.M. & S.R. in 1923 they became Nos. 14397-14416 in the same order.

Just after building, the first engine No. 1 'Ben Nevis' was renamed 'Ben-y-Gloe'. The first two of the class to be withdrawn were Nos. L.M.S. 14407 in 1931, and 14413 in 1933. The last survivor was No. 14398 'Ben Alder', and this engine is now preserved at Boat of Garten.

The class had bogie wheels 3 ft. 6 in. dia., coupled 6 ft. 0 in. dia. and cylinders

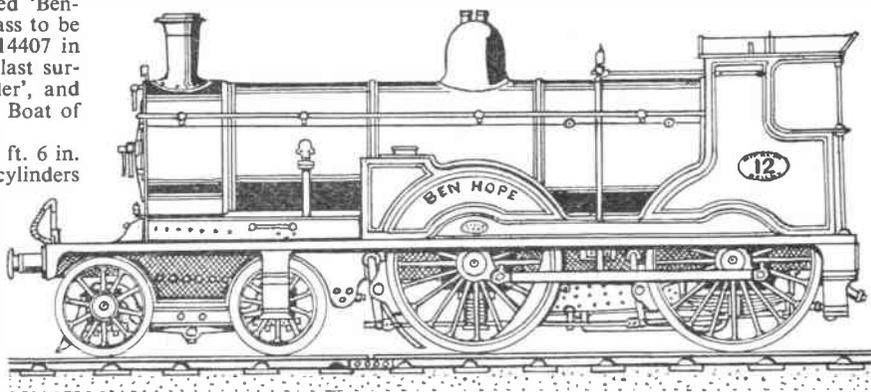
18½ in. dia. by 26 in. stroke, and were provided with six wheel tenders.

In 1908 Mr Drummond designed a modified version, known as the 'Big Ben' class. They were very similar to the Small Bens, but had larger boilers with

*By A. J. Richards*

an increased pressure. This class consisted of six engines built by the N.B. Loco. Co., Glasgow, in 1908-9. In 1923 they became L.M.S. Nos. 14417-14422, four of the class being provided with large eight-wheel tenders.

No.	Name	Maker	Date Built
1	Ben Nevis	Dubs & Co.	1898
2	Ben Alder	Glasgow	1898
3	Ben Wyvis	"	1898
4	Ben More	"	1899
5	Ben Vrackie	"	1899
6	Ben Armin	"	1899
7	Ben Attow	"	1899
8	Ben Clebrig	"	1899
9	Ben Rinnes	H.R. Lochgorm	1899
10	Ben Sloch	"	1899
11	Ben Macdhui	"	1900
12	Ben Hope	"	1900
13	Ben Alisky	"	1900
14	Ben'Dearg	"	1901
15	Ben Loyal	"	1901
16	Ben Avon	"	1901
17	Ben Alligan	"	1901
38	Ben Udlanan	N.B. Loco Co.	17398 1906
41	Ben Bhach Ard	"	17399 1906
47	Ben, a, Bbuird	"	17400 1906

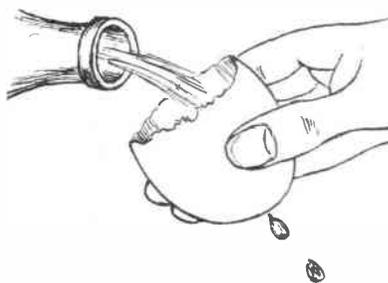


Highland Railway 'Small Ben' class 4-4-0 passenger locomotive. No. 12 'Ben Hope'

## Measuring liquids drop by drop

MEASURING drops of liquid is not such an easy job as it appears. For one thing the size of the drops can vary quite a lot. Liquid can sometimes come out of a bottle much quicker than expected, and instead of drops may turn into quite a stream.

For your chemical experiments or



when making up photographic formulac accuracy is essential, and a mistake of, perhaps, a few drops can throw the mixture completely out of balance.

For an extremely simple yet very efficient device to help you with this problem, all you need is half an eggshell. Carefully clean the shell and then make a very small hole in the bottom. Try to keep the hole smooth and even, and to do this a little reamer, which you can make yourself, will be useful. File a piece of iron wire to a sharp point, and by using the file lengthways, you will produce a series of fine cutting edges like a miniature countersink drill. By starting with a small hole you can thus enlarge it to any size you wish.

Put a little of the liquid you want to measure in the eggshell, and you will get an even flow of equal-sized drops. A

thin liquid will need a small hole, but for thicker matter it may need enlarging slightly to ensure a satisfactory flow.

For a more permanent job there are many kinds of similarly-shaped plastic containers which are very suitable.

(A.F.T.)

Next week's issue will show how to make a handsome blanket chest. There will be plans for modelling a Mini-car among other interesting features.

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# DELICIOUS MARSHMALLOWS

IT is not very difficult to understand why marshmallows are so popular with people of all ages. Although they are a comparatively new confection, their soft chewy nature soon brought them to the fore and made them firm favourites.

It appears that the original marshmallows were of French origin and were made from the glutinous substance which was extracted from the root of the marshmallow plant. Now the majority of the marshmallow recipes employ either gelatine, gum arabic or egg whites which impart the correct texture with just the right amount of sponginess.

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*By A. F. Taylor*

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The ideal marshmallow should be soft and spongy, but if it turns out rather stiff and firm it is probably because too much gelatine has been added. It is rather difficult to estimate the exact amount to use as gelatines vary so much in quality and it is advisable to always buy the best that can be obtained.

Success in making marshmallows depends to a great extent on how well the mixture is beaten. The resulting product ought to be snow white in appearance and soft in texture, and this is a sign that the process has been completed in a satisfactory manner. It is generally recommended that rapid beating for from 10 to 15 minutes is needed to turn out a successful product.

Before giving any recipes for marshmallows we must first discuss that important ingredient — gelatine, and how to obtain the best results from it. There are two types of gelatine available; powdered and sheet, and while the former is easier to dissolve, sheet gelatine is to be preferred.

Sheet gelatine must be soaked in cold water until it is thoroughly softened and all its brittleness has gone. This should take from a half to one hour. It is best to err on the safe side and give it, say, a quarter of an hour's extra soaking.

If you prefer powdered gelatine you use the same amount by weight as for sheet gelatine. It is prepared for use by placing the necessary amount in a basin. Add an equal quantity of warm water and stir until it is completely dissolved. It is then ready to add to the syrup.

It may seriously impair the properties of gelatine if it is heated to too high a temperature. It may stand up to a com-

paratively high temperature for a very short time, but prolonged heating can be bad. In most recipes the hot syrup should be allowed to cool down to about 235°F. before putting in the gelatine.

## Simple Marshmallows

1 lb. sugar  
2 level tablespoonfuls powdered gelatine  
1½ cupfuls hot water  
pinch of salt

This is a very easy recipe and probably one of the cheapest, but this does not make it any the less tasty. Soak the gelatine in half the quantity of the water for 10 minutes. Now add the remainder of the water to the sugar and boil until the temperature reaches 238°F.

When this stage is reached remove from the stove, add the gelatine and allow the mixture to cool down a little. The salt and a little flavouring can now be added but this should not be overdone. A small amount of vanilla or peppermint improves the marshmallow and other flavours may be tried successfully.

Beating the mixture should now start and be continued until it becomes thick and white, when it will be ready to pour out into trays which have been well dusted with icing sugar. The usual thickness for marshmallows is one inch.

When almost cold run a knife round the edges of the trays and turn out on to a board. Cut up into neat cubes and well dust with icing sugar. It is usual to cut up marshmallows with a silver or stainless knife moistened with cold water.

The use of glucose or maize syrup as it is: sometimes called, greatly improves most sweet recipes besides increasing its nutritive value, and this is especially so regarding marshmallows. Our next recipe is very similar to the last one but with the inclusion of glucose.

## Special Marshmallow

1 lb. sugar  
1 oz. gelatine  
¾ lb. glucose  
½ pint water  
1 teaspoonful vanilla

The gelatine must first be prepared before we start to boil the sugar and this will take at least an hour. Soak the 1 oz. of gelatine in 2 oz. of cold water and for this recipe you may use either powdered or the sheet variety.

Boil the sugar, glucose and water until the temperature reaches 254°F., then remove from the stove and let the syrup cool down slightly. Put in the vanilla essence and add the gelatine together

with the water that it has been soaking in. Stir and beat the mixture vigorously until it stiffens and turns white.

Pour into a tray lined with waxed paper and dusted with equal parts of icing sugar and cornflour. Allow it to set for about twelve hours, then cut up into 1 in. squares and dust with the same mixture. Marshmallows should be stored in air-tight tins.

## All Marshmallows

This recipe uses the whites of eggs besides the usual gelatine. It requires a little more care in its preparation especially with the egg whites when they are added. If the eggs are added while the syrup is very hot they will be cooked before the mixture can be beaten. It is therefore necessary to allow it to cool sufficiently before proceeding with the job. Here is the recipe:

1 lb. sugar  
3 oz. glucose  
2/3 oz. gelatine  
2 egg whites  
vanilla essence

First soak the gelatine, then boil the glucose and sugar which has been moistened with a little water and allow the temperature to reach 260°F. The mixture should now cool off for about five minutes, after which the gelatine is stirred in.

Beating can proceed and when the mixture has cooled sufficiently the egg whites can be added and these should have already been well beaten. Continue beating for about ten minutes until it has almost set. Pour into a tray dusted with cornflour and leave to set for from two to three days. You will notice that this recipe using egg whites needs a much longer time to set properly. Cut up when set.

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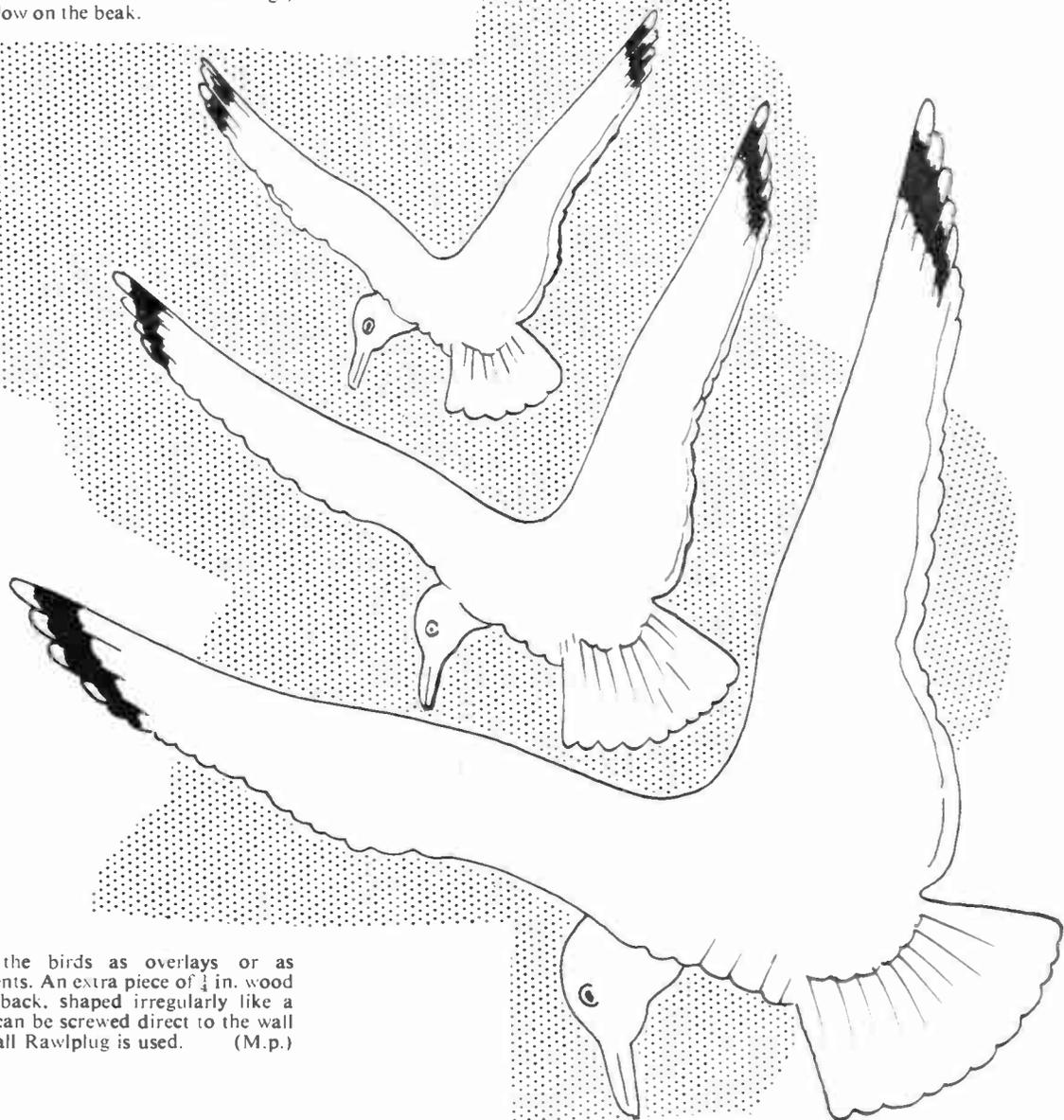
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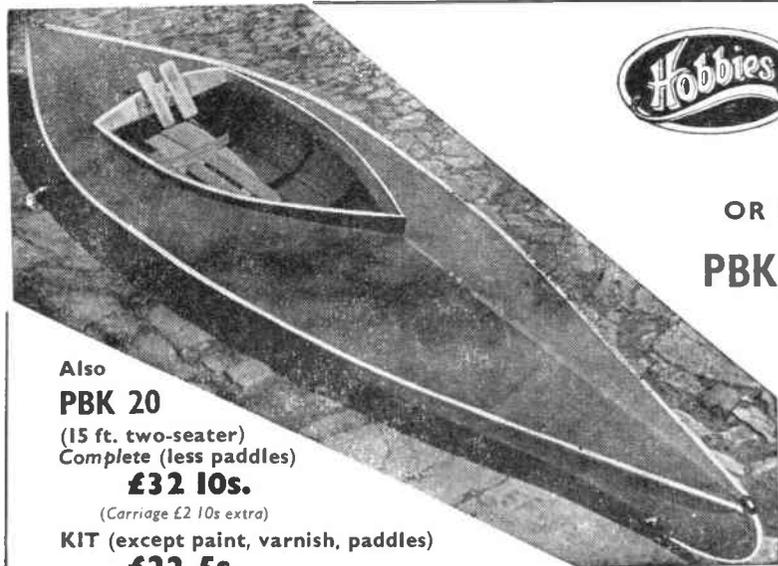
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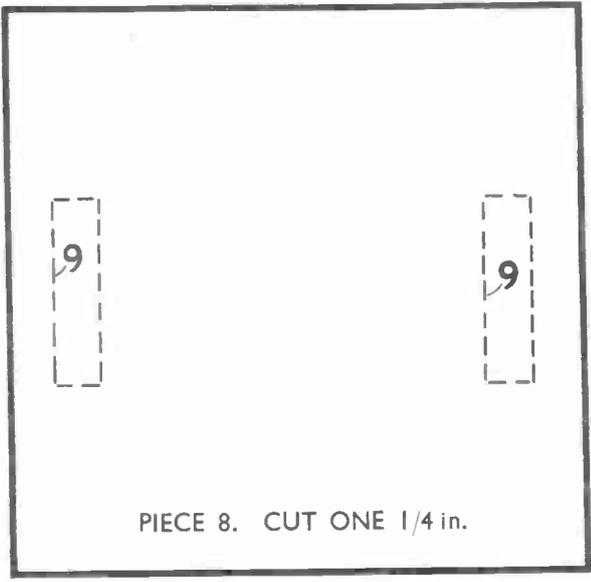
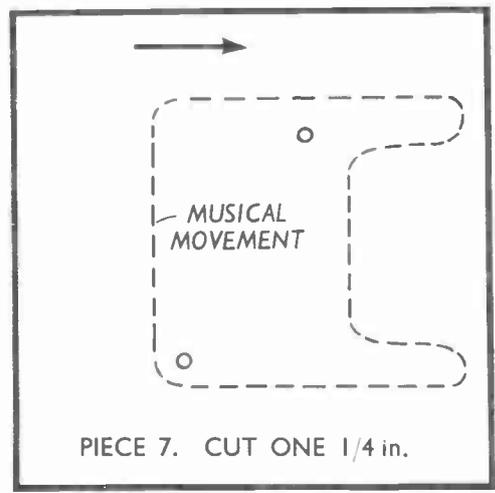
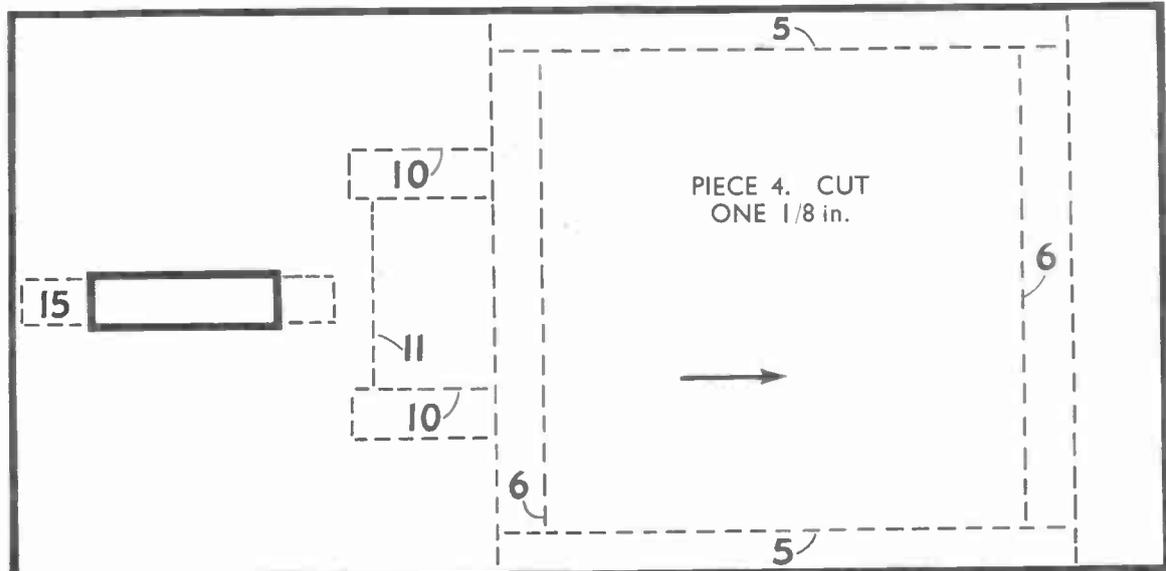
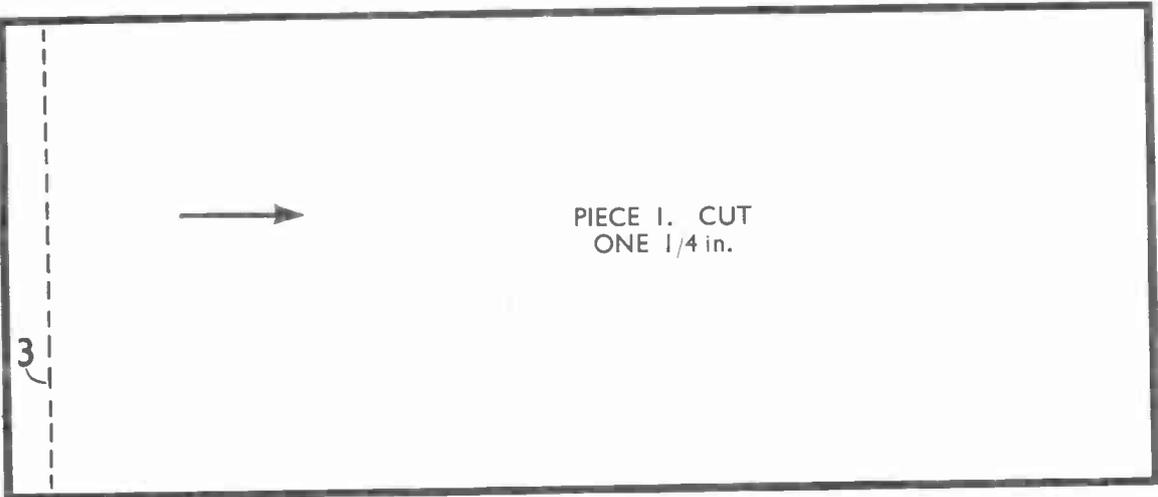
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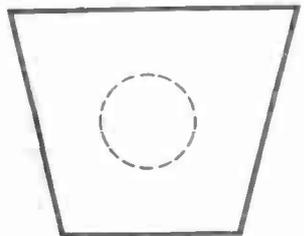
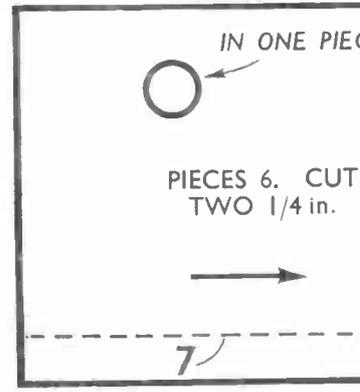
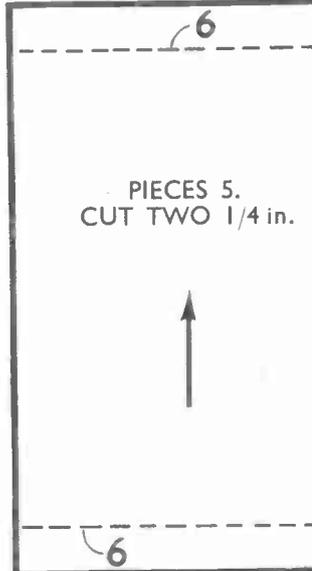
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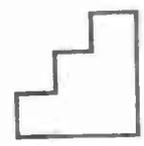
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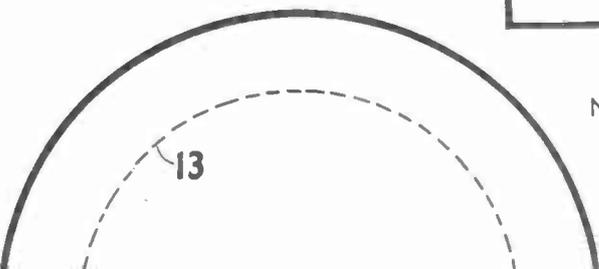
PIECE 3. CUT ONE 1/4 in.



PIECES 9. CUT TWO 1/4 in.



PIECES 11. CUT FOUR 1/4 in. GLUE TOGETHER.

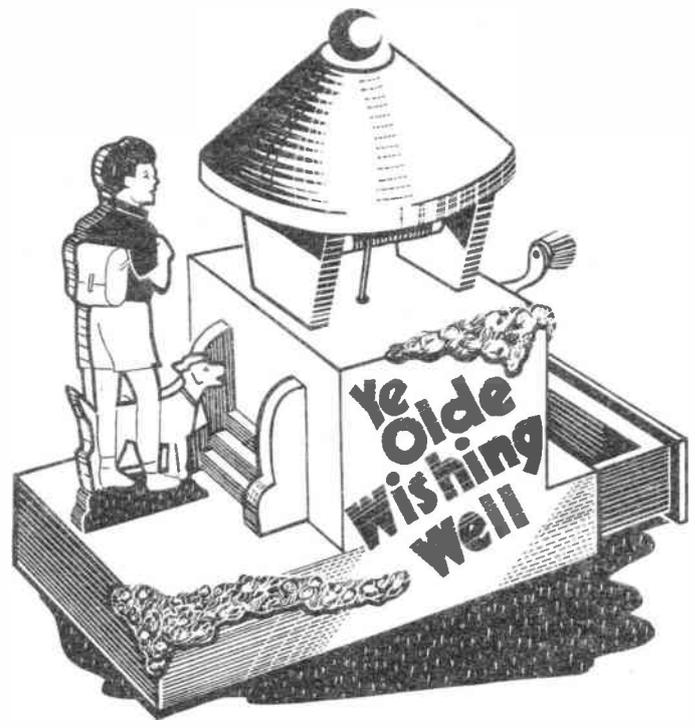


NOTE: CUT TO OUTSIDE OF THICK LINES.



**YE OLDE WISHING WELL  
MUSICAL TRINKET BOX**

SIZE : 6 ins. BY 3 ins. BY 6 ins. HIGH.



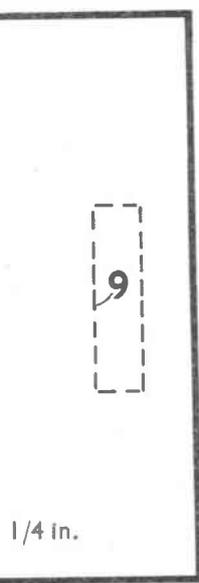
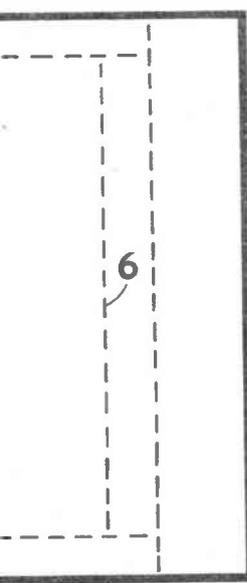
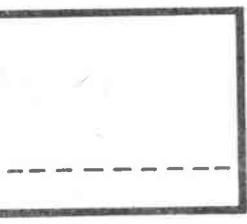
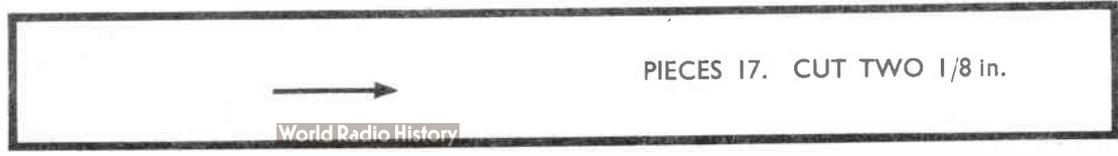
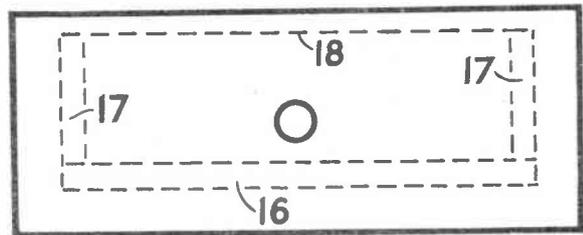
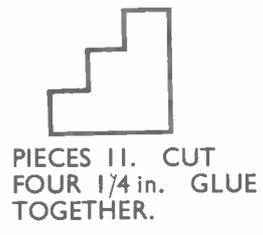
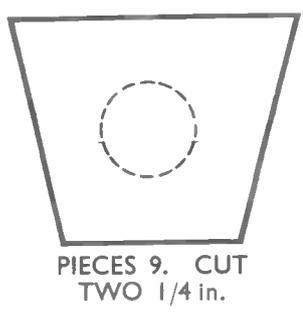
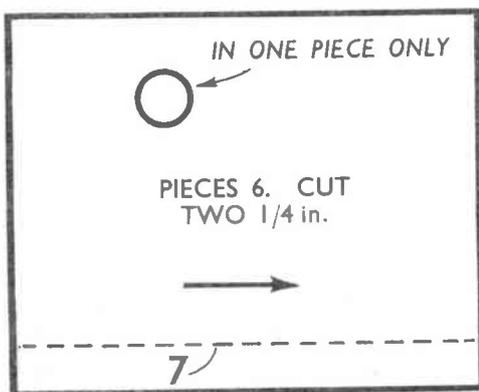
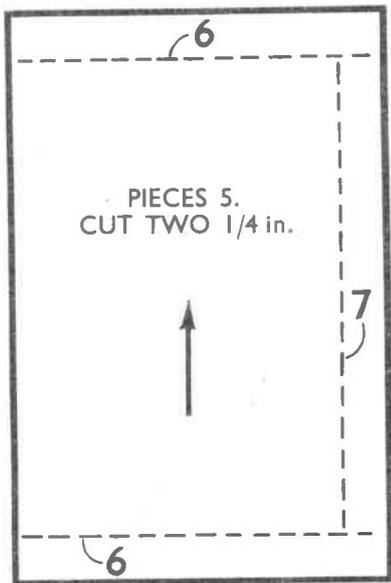
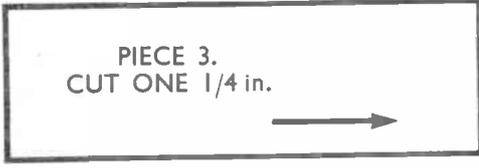
A KIT OF MATERIALS FOR MAKING THIS DESIGN IS SUPPLIED BY HOBBIES LIMITED, DEREHAM, NORFOLK. PRICE ON APPLICATION.

**A perfect finish every time**

Humbrol Plastic Enamel dries in one hour to a porcelain finish. Available in a full range of inter-mixable colours, gloss, matt or metallic. Tins from ½ oz. to ½ pint. Perfectly safe for children's toys, etc.

FROM ALL BRANCHES OF HOBBIES LTD.

Humbrol is the supreme finish for everything.  
**always use HUMBROL**

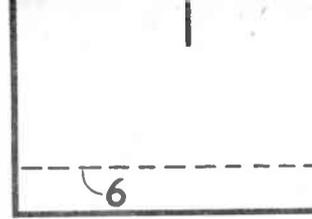


1/4 in.

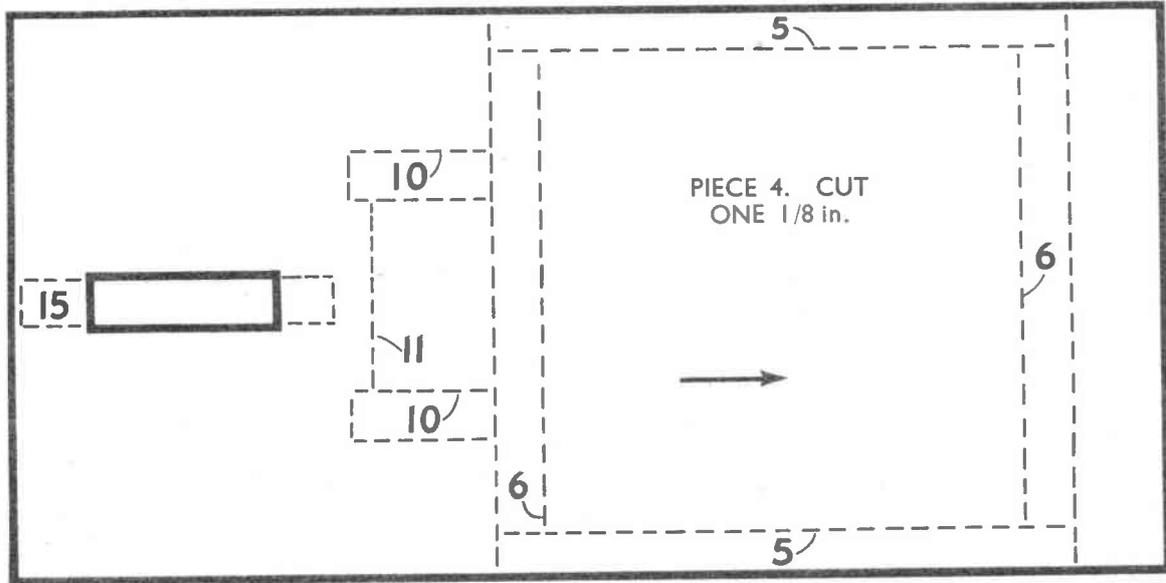
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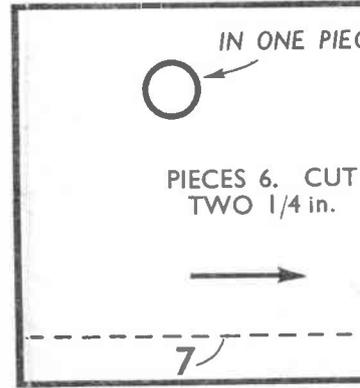
PIECES 2.  
CUT TWO 1/4 in.



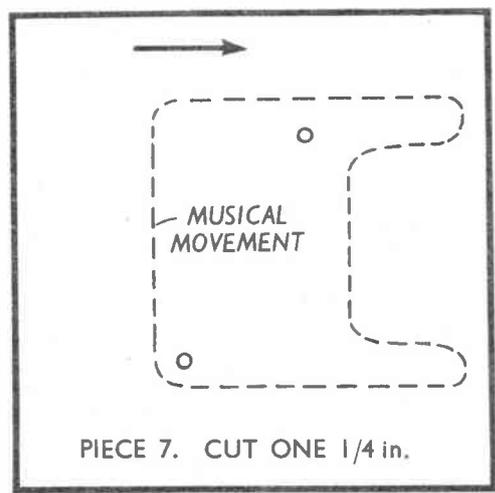
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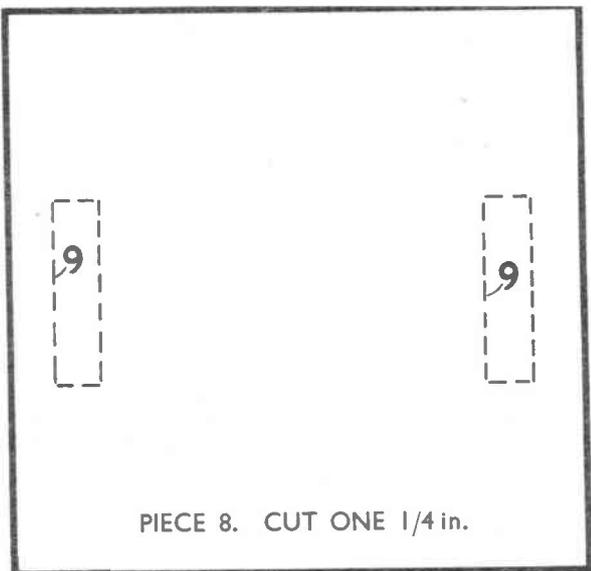
PIECE 4. CUT  
ONE 1/8 in.



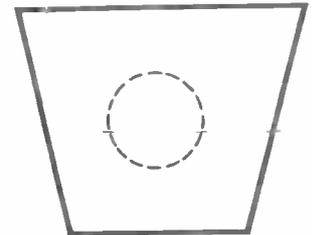
PIECES 6. CUT  
TWO 1/4 in.



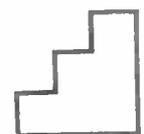
PIECE 7. CUT ONE 1/4 in.



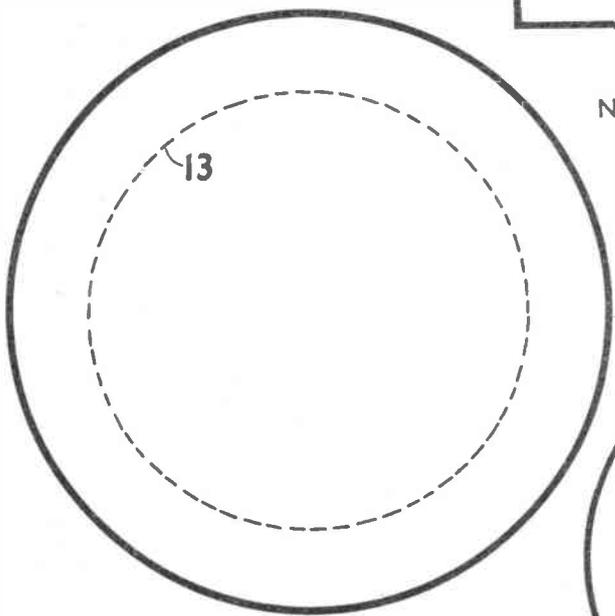
PIECE 8. CUT ONE 1/4 in.



PIECES 9. CUT  
TWO 1/4 in.

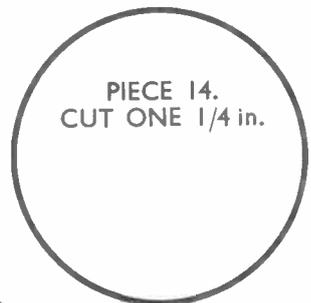


PIECES 11. CUT  
FOUR 1/4 in. GLUE  
TOGETHER.



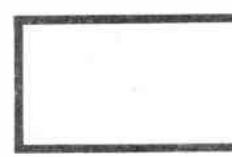
PIECES 12. CUT TWO 1/4 in.

NOTE: CUT TO OUTSIDE  
OF THICK LINES.

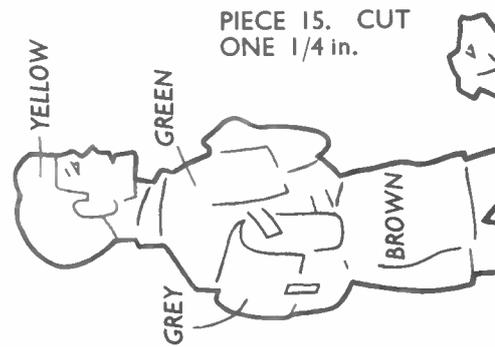
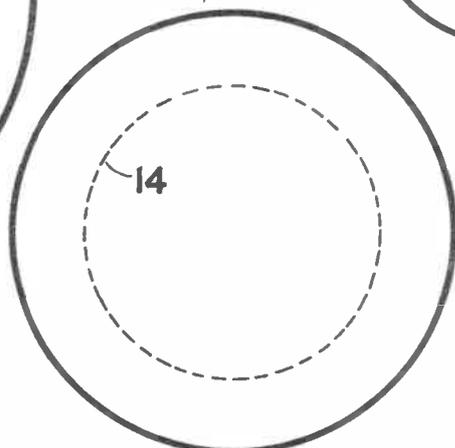


PIECE 13. CUT  
ONE 1/4 in.

PIECE 14.  
CUT ONE 1/4 in.



THE ARROWS IN  
DIRECTION OF C



PIECE 15. CUT  
ONE 1/4 in.

PRINTED IN ENGLAND.



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

### A perfect finish every time

Humbrol Plastic Enamel dries in one hour to a porcelain finish. Available in a full range of inter-mixable colours, gloss, matt or metallic. Tins from ½oz. to ½ pint. Perfectly safe for children's toys, etc.



FROM ALL BRANCHES OF HOBBIES LTD.

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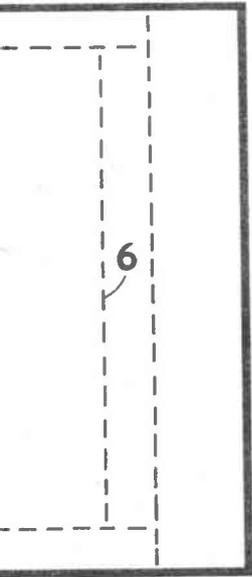
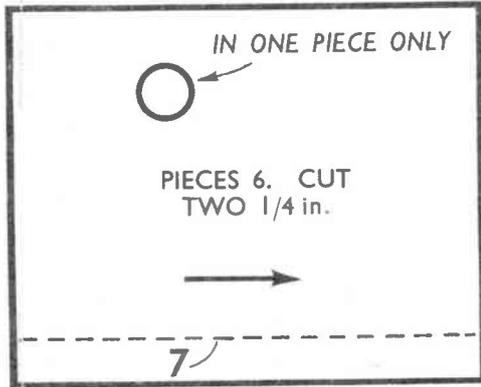
always use **HUMBROL**



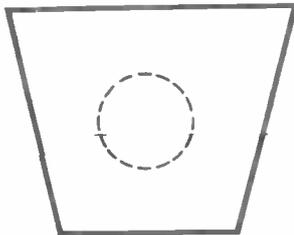
IN ONE PIECE ONLY



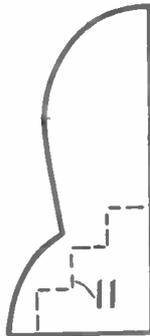
PIECES 6. CUT TWO 1/4 in.



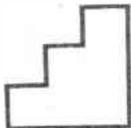
6



PIECES 9. CUT TWO 1/4 in.

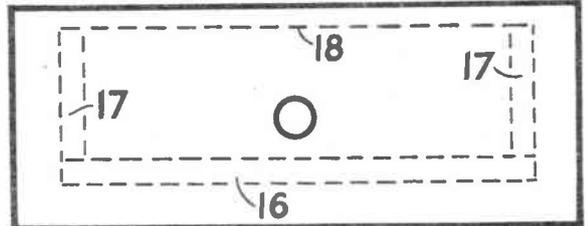
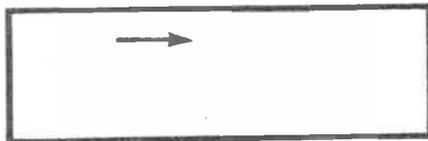


PIECES 10. CUT TWO 1/4 in.

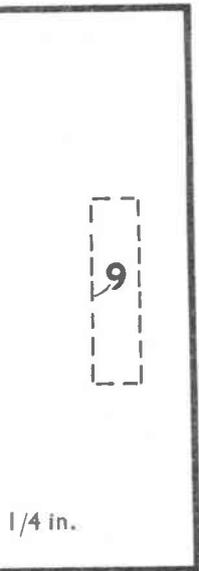


PIECES 11. CUT FOUR 1/4 in. GLUE TOGETHER.

PIECES 18. CUT TWO 1/4 in.



PIECE 19. CUT ONE 1/8 in.



9

1/4 in.

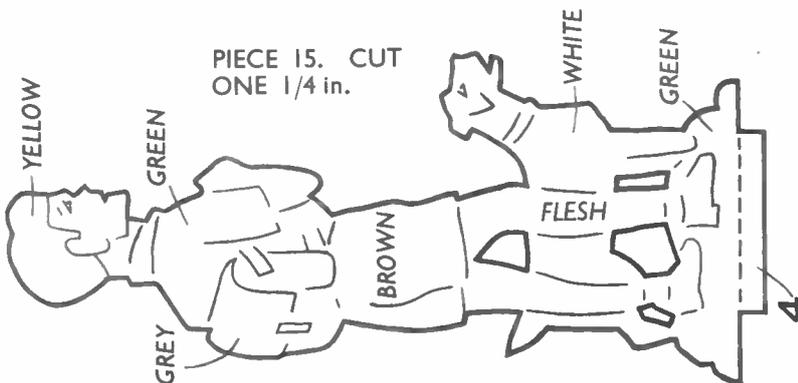


PIECES 17. CUT TWO 1/8 in.

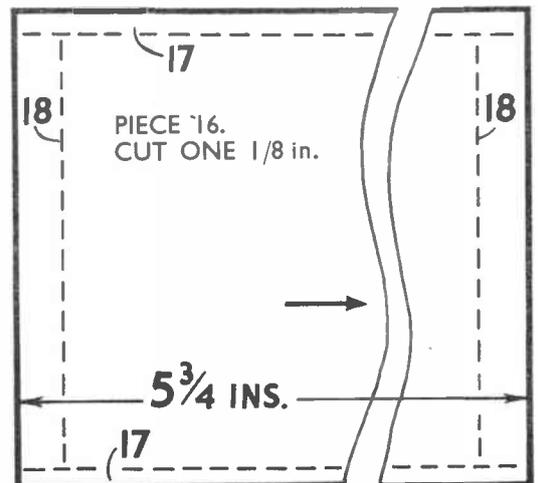
THE ARROWS INDICATE DIRECTION OF GRAIN OF WOOD.



PIECE 14. CUT ONE 1/4 in.



PIECE 15. CUT ONE 1/4 in.



PIECE 16. CUT ONE 1/8 in.

5 3/4 INS.