

# HOBBIES WEEKLY

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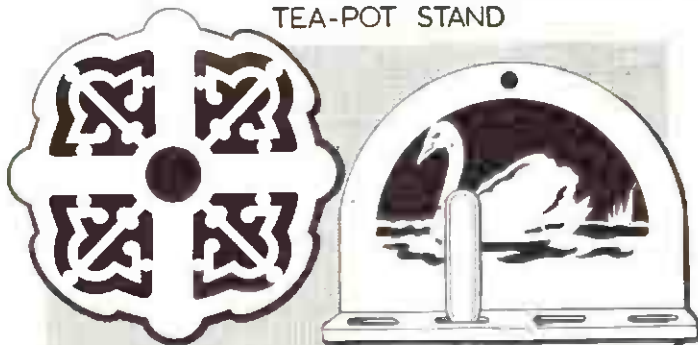
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All correspondence should be addressed to the Editor, Hobbies Weekly, Dereham, Norfolk

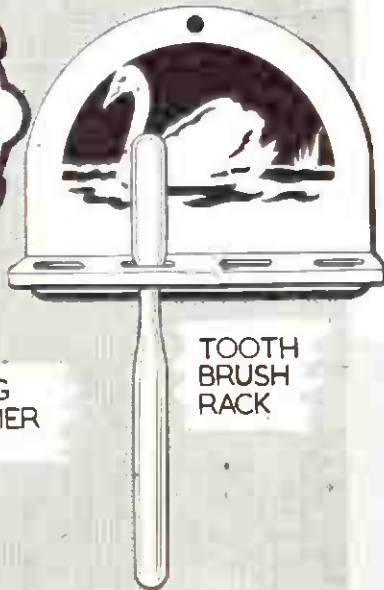
TEA-POT STAND



EGG  
TIMER



TOOTH  
BRUSH  
RACK



**FREE**  
design  
inside

**Useful**  
household  
articles

## THE 'HOME' TRIO

209

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

World Radio History

4<sup>10</sup>/<sub>2</sub>

# CAN WE HELP EACH OTHER?



**V**ERY often we receive requests for copies of old fretwork and model designs brought out by Hobbies Ltd but which are now out of print. It is realised that quite a number of readers, particularly among the older ones, are still keen on this type of work, such as making up models of the Taj Mahal, Buckingham Palace, etc.

It would be impossible for Hobbies Ltd to maintain complete stocks of all the thousands of designs which they have brought out since 1895, but maybe readers can help fellow enthusiasts in specific instances. For this reason, *Hobbies Weekly* is prepared to print any such request or offer free of charge, and negotiation and all correspondence must, of course, be between the supplier and the person interested once the initial introduction has been made through this magazine. Please send any offers to the reader making the request and not to the Editor, who cannot undertake to pass on information. It is envisaged that possibly some of our readers have kept a good store of their designs, and it is hoped that they would like to help other readers on a friendly basis.

This service is prompted particularly by a request from Mr H. Thompson of 267 Golden Hill Lane, Leyland, Nr. Preston, who seeks 'designs such as the Taj Mahal'. Apparently he wants

something on which he can expend a lot of time and labour — on the lines of model coaches, trains and buses, etc.

### Co-operation sought

Readers, therefore, who require any specific design should state their requirements to the Editor who will publish details in the magazine providing, of course, that the design cannot be supplied in the first instance by Hobbies Ltd. Another point to bear in mind is the fact that as we prepare for press many weeks in advance of publication, it is no use readers sending in a request one week and expecting it to be published the next. Unfortunately the service cannot be as expeditious as all that, but we do hope that readers will avail themselves of it and that much co-opera-

tion will thus be engendered.

This is intended purely as a reader-help service and publication is entirely at the discretion of the Editor. Our advertising columns are, of course, open to all who have any requirements or anything to offer outside this sphere and our experts are always ready to advise on other problems connected with subjects covered in this magazine.

Mrs. A. Vardy, 53 Parkside, Somercotes, Derbyshire, would appreciate any Hobbies designs which have 'a lot of work in them', and which are now unfortunately out of print. Required for her 14-year-old son Roger, who has just executed a lovely design of the Lord's Prayer tablet which he is seen holding in our picture.

## Making the 'Home' Trio

**P**ROJECTS for use in the home are always popular, and a ready welcome will be found for the three described here, consisting of a teapot stand, toothbrush rack and egg-timer.

For the proficient fretcutter the designs will provide interesting and worthwhile exercises, and at the same time they are ideal subjects for those just starting this absorbing work. All the models have a very practical use in the home, and will be very acceptable as gifts at any time of the year.

The construction of each is very simple, but the value of the finished work will depend most of all on the clean cutting and the final decoration. As in all fretwork projects, care is most essential. Do not hurry your work — take the cutting easily and calmly, always remembering to keep the blade of the saw upright.

The three designs are shown full size on the sheet, and all are cut from  $\frac{1}{4}$  in. wood. Trace the outlines and transfer by means of carbon paper to the wood. Alternatively, of course, the tracing can be done direct from the design sheet to the wood with carbon paper. Then cut out the various pieces with a fretsaw, cutting the interior frets first of all before finishing with the outlines. Clean up all the pieces before fixing together.

In the case of the teapot stand, four toes are added underneath, and it can be backed with any coloured material to give a pleasing effect.

The toothbrush rack consists of two pieces which are glued together. There is

**KIT FOR 5/6**  
**Hobbies Kit No. 3296**  
**for making all the**  
**articles in the 'Home'**  
**Trio costs only 5/6 and**  
**includes a sand-glass for**  
**the egg-timer. Kits from**  
**branches or by post**  
**from Hobbies Limited,**  
**Dereham, Norfolk (post**  
**1/6 extra).**

a hole for hanging the rack on the wall, and here again backing material can be added to show up the outline of the swan.

The egg-timer depicts two Dutch boys, and here a strut is hinged at the back for standing purposes. The fixing of the egg-timer is shown in detail on the design sheet, the U-shaped piece (D) being glued to the circle (C) after the timing glass has been inserted.

# HOBBIES 1959 COMPETITION ...

# £200 IN PRIZES MUST BE WON!

# TAKE YOUR PICK from a HUGE RANGE of TOOLS KITS Etc.

\*MACHINES



\*OUTFITS



\*KITS

\*TOOLS

## ENTRY IS FREE!

A WONDERFUL opportunity for readers to augment their tool kits is presented by Hobbies 1959 Competition in which prizes to the value of £200 must be won.

Apart from tools, winners can choose anything they fancy — up to the value of their winning voucher — from the catalogue pages of Hobbies 1959 Annual, including kits and materials, etc.

The competition is quite simple, and to give all a chance is divided into two sections — for seniors and for juniors aged 15 and under. Top prize voucher in the senior section will be 15 guineas, and the chief junior prizewinner will receive a voucher for 12 guineas. There are many other main awards in the two sections, and also dozens of £1 vouchers and consolations for runners-up.

Full details of the competition were given in *Hobbies Weekly*, dated 10th September 1958, and new readers can obtain a copy from the Editor (price 6d., including postage). This contains a design for the 'Viking' Thermometer Plaque, the subject of the competition, which has to be cut out as neatly as possible and submitted to the judges.

It will cost you nothing to enter the competition, so make a start right away and be determined to see your name in the prize list.

## CHOOSE FROM ANY ITEM LISTED IN HOBBIES 1959 ANNUAL

### COMPETITION KIT FOR 3/3

Hobbies Kit No. 3280 for making the plaque (illustrated on the left) costs only 3/3 and is obtainable from branches or by post from Hobbies Ltd., Dereham, Norfolk (postage 9d. extra).



# USEFUL AID FOR PAINTERS



**M**ANY readers nowadays do their own home decorating and may welcome the 'painters' aid' for the confidence it will give them when painting a wall, or whitewashing a ceiling whilst perched on the treads of the household steps. The lower treads seem safe enough, but when the upper ones are used, a feeling of insecurity is felt as there is nothing to clutch at when balance becomes uncertain. Using the painters' aid, it is easy to steady oneself in such circumstances, as a vertical handle is provided.

The article is simple to make. It comprises, in addition to the vertical handle mentioned, a tray to hold any tools not in use at the moment, and a separate compartment for the security of the paint tin. The aid is bolted to the top of the steps and therefore removable when not required.

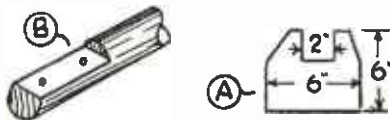
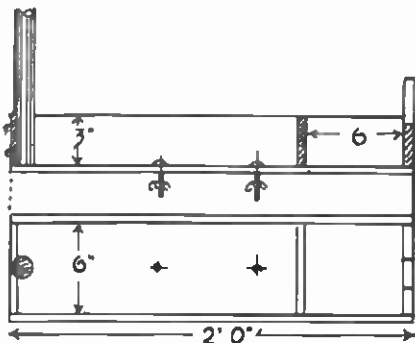
A sectional side view is given in the diagram, with a plan view underneath. Any wood available can be employed in its construction. Deal  $\frac{1}{2}$  in. thick is suggested as most suitable for the tray, and  $\frac{1}{4}$  in. plywood for the bottom of the tray. A piece of 1 in. diameter wooden rod will serve for the vertical handle, a short length of broomstick, for example.

Cut the sides of the tray to lengths given. The right end one is higher than the rest and is shown separately at (A). The portion standing above the tray, has a 2 in. wide slot cut out for the handle of a paint or whitewash brush to rest in, thus helping to keep the brush in position when it is at rest upon the paint tin. The left-hand side piece has a groove  $\frac{1}{2}$  in. deep cut down the middle to receive the lower end of the vertical handle.

All four sides can now be strongly nailed or screwed together, and a divi-

sional piece nailed across to form the paint tin compartment. Before the bottom of the article is cut and fixed, it will be as well to try the fit of the vertical handle in its groove. Cut the rod to a suitable length, say about 2ft. This will, in most cases, prove high enough. At the lower end cut a  $\frac{1}{2}$  in. rebate as shown at (B). The width of the groove cut in the side of the tray should correspond with that of the rebate and the rod should be admitted as a tight fit.

Now nail and glue, or screw on the bottom of the tray, fit the vertical handle in the groove, and there firmly screw it to the side of the tray, the screws, round-headed ones for preference, being driven in through the side of tray well into the rod.



At the points in the base shown in the plan view, drill a pair of  $\frac{1}{2}$  in. holes 6 ins. apart. Place the aid on the steps and, holding it firmly in place, mark with a pencil the position of the relative holes to be drilled through the top of the steps. Having drilled these, fix the aid to the steps with  $\frac{1}{2}$  in. by 2  $\frac{1}{2}$  in. screw bolts, fitted with wing nuts for quick adjustment.

A final tip. Prevent the paint, or distemper tin from sliding about its tray by wrapping a thick wad of newspaper round it. Not only will this keep the tin in position, but will also absorb many of the inevitable paint or distemper splashes. (W.J.E.)

TWO MINUTE

QUIZ

by Ed Capper



1 NAME TYPES OF SCREW HEADS?

2

WHAT TYPE OF JOINT?



3

NAME THE GROOVE UNDER WINDOW SILL AND ITS USE

4

NAME THE BOTTOM CURVED STEP

5

IN WHAT WAY IS THIS VENTILATOR CHANCY?

ANSWERS ON PAGE 221

# EVEN A RAT CAN BE CHARMING!

TO most people rats are symbols of pestilence and dirt, and although this may to some extent be true of the wild scavenging rat, as a domestic pet the tame rat is ideal. At one time 'white rats' were popular pets with boys, but nowadays they have been largely ousted by the golden hamster. Charming as the latter may be as a pet, there is no reason to ignore the virtues of rats, for although both are rodents, the two animals are different in character, and neither can be said to be 'better' than the other.

By P. R. Chapman

The two species of wild rat in this country are the Brown (*Rattus norvegicus*) and the Black (*Rattus rattus*). Although both have been introduced at some time, the latter is by far the older inhabitant. The later introduction of the brown rat caused a marked decrease in the numbers of the black, which is now mainly confined to ports and dock areas. It is the brown rat from which the tame varieties are descended. This is a rather larger, less active animal than the black.

Tame rats, although often typical albinos with pink eyes, are also commonly met with in piebald forms, or more or less completely black. The latter are particularly attractive with their sleek coats and black, beady eyes. Provided their quarters are kept clean



Time for 'elevenes'

(necessary with all pets), rats are odourless, not possessing the typical musty smell inseparable from tame mice, and although a strong metal cage would be essential to confine a true wild rat, tame ones do not attempt to gnaw their way out of an ordinary wooden cage. They appreciate, however, odd pieces of wood to exercise their teeth.

#### Make a box

As a pet there is little to choose between a male or female animal. The males are larger and heavier, with rather coarser fur, almost hair-like when adult, whilst the female is of a slighter build, and is soft and silky to the touch. In the writer's experience, however, the female is of a more nervous disposition than the male, although some claim that she is more intelligent.

Accommodation is not difficult. A suitable box can easily be made at home. For one or two rats, it should be about 18ins. long, 10ins. wide and 10ins. high. The front should consist of wire netting ( $\frac{1}{4}$ in. mesh is cheap and suitable) and the top a hinged frame of netting. If the bottom is of netting also, the cage may be stood in a tray or on newspaper, and cleaning is thus facilitated. A separate sleeping compartment is not necessary, provided a heap of straw, shavings or newspaper is provided in one corner. (The newspaper will be shredded and arranged by the rats themselves.)

If a pair of rats is kept, the results may well be anticipated, and unless a large colony is required, sexes should be kept separate! Unlike mice and hamsters, rats are peaceful creatures and two or more males will live happily together, provided they are introduced into their 'home' at the same time (a 'stranger' is

liable to be attacked) and that a female is not put among them, when fighting may occur. If any breeding is attempted, the expectant mother should be put on her own before the litter is born, and given some privacy in the form of an extra box in the corner of her cage. Plenty of newspaper may be put into the cage and she will shred this to make a cosy nest.

The period of gestation is about three weeks. New-born rats are ugly, but in a few weeks when they get their fur and run about, they are charming little creatures. Up to ten or twelve may be born in one litter (exceptionally more), and owing to the varied hereditary make-up of the parents, their colouring is often quite variable. By crossing an albino male with a piebald female, the writer obtained a litter of ten, consisting of two albino males, seven black males and one black female; all the blacks had white markings on the underside.

#### Tame and friendly

If just one pet rat is kept, in order to obtain the maximum enjoyment from it, some attention should be given to it each day, when it will quickly become very tame and friendly. Rats are sociable creatures and if deprived of company of their own species, they appreciate that of humans. The pet will greatly enjoy a run in the evening in the room (naturally, doors must be shut and any family cat or dog kept away), when it will amuse its owner by its antics and curiosity. The tame rat takes after its wild relative in not being as good a climber as the black rat, but it will jump considerable distances if it can smell a choice piece of food, and will usually find its way to the fruit dish! Rats have poor eyesight but an excellent sense of smell. The owner



Cheeky peek from a shopping bag

need have no fear that he will not be able to catch his pet again for, when tame, a rat has no fear of humans.

### Keeping clean

The rat is a most fastidious animal and hates to soil its coat. This even applies to the wild rat, although the conditions under which it lives must be somewhat discouraging. It will frequently be seen to wash and groom itself all over, and an albino animal usually appears spotlessly clean. If the rat was free of parasites when bought, it should remain so, but occasionally a few lice may have been picked up under pet-shop conditions. These are specific to rats and will not transfer to humans or other domestic animals. They do, however, irritate the animal, and a dusting with a 'pest powder', obtainable from the shop, should quickly dispose of them.

Rats are truly omnivorous animals and their feeding is simplicity itself. However, for a healthy pet a balanced diet is necessary. Oats, wheat, or better, 'mixed grain' can form the basic diet, and to this should be added scraps of meat, cheese, cold potato, brown bread (preferably hard), vegetables (particularly lettuce), fruit, etc., as and when convenient. Proprietary brands of broken biscuit food for dogs are excellent, as these are usually a balanced food and are very hard. It is essential to include some hard food daily as, like all rodents, rats have continuously growing incisor teeth and these must be kept worn down or they will get too long. One meal a day, preferably in the evening, will be sufficient. Milk is appreciated, and this or water should always be available in the cage. It is a mistaken belief that rats and mice do not drink.

Rats are on the whole healthy animals, and provided the pet receives a satisfactory diet it should live its full duration of life happily. Unfortunately, like hamsters, rats are not very long-lived animals, about three years being a good average.

### From pet shops

Since rats are not as popular as pets as they once were, some difficulty may be encountered at the first attempt to purchase one, but the larger pet shops usually stock them from time to time. Naturally, a young animal should be obtained (probably about the size of a large mouse) and the price would be from 5/- to 7/6. For this sum, a clean, easily fed and charming pet may be obtained that will give its owner many hours of pleasure and amusement.

## CHOOSING THE ADHESIVE

MODERN adhesives are now so varied and efficient in their application that 'do-it-yourself' jobs around the home are simplicity itself. Yet, many people do not appreciate the long and extensive experiments manufacturers have made for the public's benefit and still plod along doing repair jobs in the old-fashioned and often longer way.

Take mother for instance. She will spend hours tacking and hemming the new curtains. Probably, once a week she will sit down to the all-consuming and tedious session of sock darning. Then there are the frayed carpet edges that always seem to need binding . . .

Or, take father. He will spend at least an evening trying to re-sole his favourite slippers. Or that fabric-covered pelmet he is making for the dining room. With aching back he will spend hours fixing down the material with tin tacks. A versatile adhesive such as Jiffytex would do all these jobs in half the time.

Other adhesives concentrate on plastic and PVC products. There is now no need to scrap that plastic mac when it gets ripped. And those plastic curtains for the bathroom can be hemmed quite easily with an adhesive instead of the fidgety sewing-between lengths of ordinary fabric that was formerly the only way. Other uses for a plastic adhesive is in repairing handbags, car covers and the kiddies' favourite toys that always seem to get broken first.

Just out on the market is a new binding agent, obtainable in whatever matching colour you like. Primarily designed as a paste carpet binder, it will also fill in gaps in woodwork, linoleum or around sinks and baths. Also, the

matching colours can be used with advantage in binding lampshades, pelmets, etc.

It makes the binding of frayed carpets simplicity itself. The adhesive is used straight out of the tube nozzle. The frayed edges are simply turned back and the adhesive applied. It dries within a few moments, sealing all the frayed edges in a jiffy.

In brief then, before starting any repair job, walk around to your local dealer and have a chat with him. It's an even bet he will stock an adhesive or binder just right for the job in hand.

(E.C.)



● Continued from page 215

## ALL ABOUT LITHIUM

strontium nitrate solution, sodium carbonate solution and sodium phosphate solution. Precipitates of strontium carbonate and strontium phosphate appear. Since lithium has a red flame colour and an insoluble carbonate and phosphate, how are we to distinguish the two metals? Add some dilute sulphuric acid to solutions of lithium nitrate and strontium nitrate. Lithium nitrate yields no precipitate, whereas strontium nitrate gives a white one. Hence, distinction between the two metals is readily made, since lithium sulphate is soluble and strontium sulphate insoluble.

The preparation of lithium sulphate has already been outlined in the recent series of articles on making chemicals. There remains another important lithium salt. This is lithium chloride. Like potassium and sodium chlorides, it is

soluble in water.

Put about 5 grams of lithium carbonate into a beaker, just cover it with water and add strong hydrochloric acid a little at a time until most of the carbonate has dissolved. Carbon dioxide is, of course, evolved, and so some foaming occurs. This is why the acid should be added a little at a time. Filter the solution and evaporate it to dryness. Bottle the resulting white lithium chloride while it is still warm. Use a screw top bottle and insert a disc of rubber (Fig. 2), to give an hermetic seal. The reason for these precautions is that lithium chloride is one of the most deliquescent salts known. You may readily see this by leaving a little on a watch glass. It becomes wet almost immediately by attracting moisture from the air.

(L.A.F.)

# CHEMISTRY IN THE HOME

THE chemistry of lithium is generally much neglected in the home laboratory. Why this should be so is probably due to there being little or no information about it in the smaller text books, for the cost of such experiments is no bar, the raw material being only slightly higher priced than that for the common metals and vastly cheaper than the silver compounds so generally handled.

The interesting facts about this element given in this article will give a good picture of lithium chemistry, which will doubtless be welcomed by the practical home chemist.

Lithium itself is a silvery white metal.

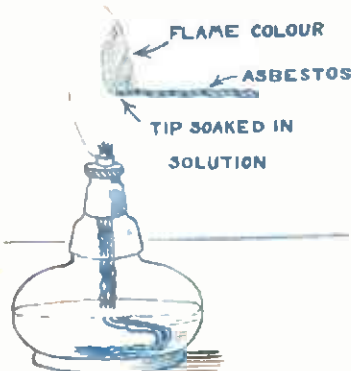


Fig. 1—Identifying the alkali metals by their flame colours

It has the distinction of being the lightest of the metals, so light, in fact, that it floats not only on water, but on petrol, which, as is well known, itself floats on water. Lithium is only slightly more than half as heavy as water. It may well be asked why it has not been used for aircraft and similar engineering on account of its lightness. Lithium belongs to the same family as the alkali metals sodium and potassium. Like them it is very readily attacked by moist air, but to a less extent. This defect bars it from alloys though it is alloyed in minute amounts in *Bahn-metal*, an alloy used for bearings.

Its compounds, on the other hand, have been used in medicine. Lithium forms a fairly soluble urate. Doctors have long used lithium salts in treating gouty conditions to dissolve the urate deposits in the body. Many spa waters contain lithium and on this often depends

their anti-rheumatic qualities.

Lithium carbonate is a white powder. Shake some of it in a test tube with water. You will find it appears not to dissolve. Actually a trace does so, but for practical purposes it is insoluble. In this it is unlike the carbonates of its relations, sodium and potassium. To investigate lithium we must therefore produce from it a soluble salt.

## Lithium nitrate

Because it leads to some typical compounds, lithium nitrate is a good one to start with. Stir 13 c.c. of strong nitric acid into 40 c.c. of water. Weigh out 7.5 grams of lithium carbonate and add

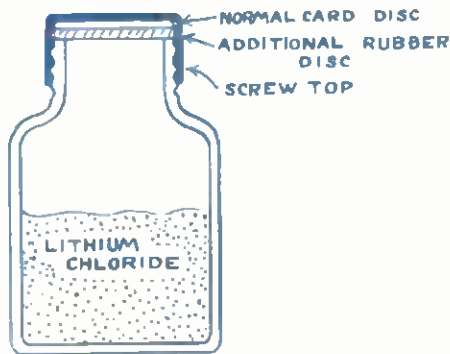


Fig. 2—An efficient seal for a deliquescent chemical

it little by little to the diluted nitric acid. Use a fairly large beaker, such as a 250 c.c., for carbon dioxide is, of course, given off, causing foaming. When all the carbonate has been added boil up the solution, filter and evaporate the solution of lithium nitrate so obtained to dryness or the water-bath. A white mass of lithium nitrate remains. As it is deliquescent, store it in the same way as for lithium chloride (see below and Fig. 2).

Being one of the alkali metals, it will be expected that lithium forms a soluble hydroxide which has a strong alkaline reaction. The most convenient way to make the hydroxide is by way of the lithium oxide. This you can make by heating a few grams of lithium nitrate, for it easily breaks up into lithium oxide. Remove the tinning from a deep tin lid by heating it in the fire. Polish it bright with emery cloth and then heat the

## ALL ABOUT LITHIUM

lithium nitrate upon it. Do this in the open air, for harmful oxides of nitrogen are given off. The nitrate fuses and then effervesces. When effervescence ceases let the whole cool. White lithium oxide remains. In this reaction lithium behaves differently from the closely related sodium and potassium nitrates, which leave residues of the respective nitrites.

Keep half of the lithium oxide for your stock and treat the remainder in a test tube with a little water. The oxide dissolves to a colourless solution. Put a drop of the solution on a slip of red litmus paper. The paper turns blue showing the solution to be an alkali. It is in fact lithium hydroxide solution. By evaporating it to dryness in the tin lid you will obtain a white residue of lithium hydroxide.

Sodium and potassium phosphates are soluble in water. In a test tube add a little sodium phosphate solution to one of lithium nitrate. A white precipitate appears. Double decomposition has taken place in the normal way when two salt solutions are mixed. Sodium nitrate and lithium phosphate will have been formed. Since sodium nitrate is soluble, the precipitate must be lithium phosphate. This is, in fact, the case, and affords another means of distinguishing lithium from potassium and sodium.

The precipitation is more complete if trisodium phosphate is used and so this is the method which gives the best yield in preparing a specimen. Dissolve 4.3 grams of lithium nitrate in 50 c.c. of water. The trisodium phosphate can be made by dissolving 6 grams of ordinary sodium phosphate in 50 c.c. of water and adding thereto 7 c.c. of a 10 per cent solution of sodium hydroxide. Boil and mix both solutions, continue boiling a few minutes, filter off the precipitate, wash it well with water on the filter and then dry the lithium phosphate in the domestic oven.

## 'Flame' identification

Flame colours are interesting as well as important in identifying metals. Separately dip the tips of threads of woolly asbestos into solutions of lithium nitrate, of a sodium salt and of a potassium salt. Hold the threads one after the other in a gas or spirit lamp flame (Fig. 1). Lithium nitrate colours the flame red, sodium yellow and potassium lilac.

Repeat the experiment with strontium nitrate solution. Again a red colour appears. In separate test tubes add to

● Continued on page 214

# MOISTURE IN THE AIR

**W**ATER exposed to the open air is always evaporating unless the air is already saturated with water vapour. The invisible water vapour mixes with the air and renders it more or less damp. Neither very dry air nor very damp air is good for normal health.

A cloud overhead does not necessarily cause rain to fall. The small drops of water which make up a cloud tend to fall downwards, and if they pass through layers of warm air which is nearly saturated with moisture, more water

The evaporation gauge illustrated in Fig. 2 has many important uses.

The rates of evaporation of water may be measured indoors, in the open air on a calm day and on a windy day, in the sunshine and in the shade and in a confined space.

The rate of evaporation of water from such a gauge indicates the amount of moisture in the air, and whether or not rain is likely to fall. Obviously if the air is saturated no further evaporation can take place, and then roads and pavements remain wet for a longer time.

cardboard scale which is fixed behind the glass tube. To calibrate the scale water may be drawn from the tin 5 c.c. at a time with a pipette.

## Hygrometers

A hygrometer is an instrument which indicates the amount of water vapour in the air at any given time.

Fig. 3 shows how a bundle of seaweed may be used to make a simple hygrometer.

This may be calibrated to give a rough measure of the percentage humidity by comparison with a paper hygrometer giving direct percentages of humidity.

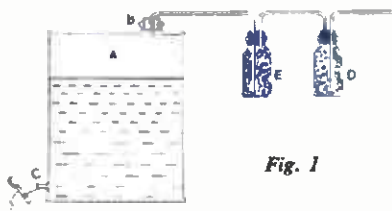


Fig. 1

condenses on their surfaces, they become larger and fall more rapidly, perhaps reaching the earth as rain.

Rain is more likely when the air is saturated with moisture.

The presence of moisture in the air can be shown by drawing air through a small bottle (D) filled with fresh calcium chloride (see Fig. 1). (A) is an old petrol can fitted with a rubber bung (B) and a short length of  $\frac{1}{8}$  in. diameter brass tubing (C) as an outlet for the water with which the can is filled before starting the experiment. The rate of flow of the water from (C) can be controlled by means of a length of rubber tubing and a Hoffman's clip. (E) is also filled with calcium chloride to prevent the moisture from the damp air in (A) from reaching the bottle (D) which is weighed before and after the experiment to determine the amount of moisture taken from the air, the volume of which is measured by catching the water from (A) in a measuring jar.

(a) You can now calculate the amount of moisture in a cubic metre of air in the room.

(b) Measure the temperature of the room and, from tables, find out how much moisture a cubic metre of air could hold at this temperature if it was saturated.

$\frac{a}{b}$  as a percentage gives the percentage humidity of the air in the room.

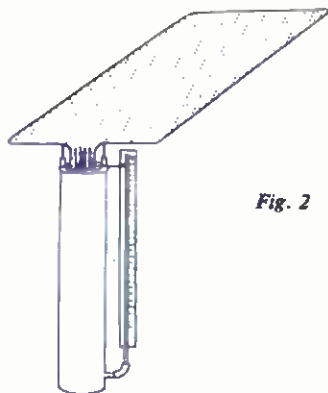


Fig. 2

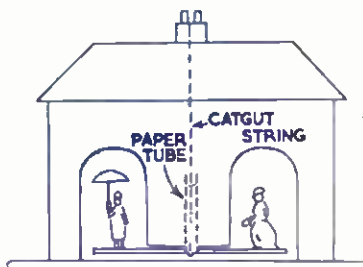


Fig. 4

The evaporation gauge illustrated consists of a tall narrow tin can. A small hole is drilled in the tin near the bottom, and into this is soldered a short piece of copper or brass tubing to which is attached a piece of glass tubing by means of a short length of rubber tubing. The upper part of the glass tube is fixed to the tin with a piece of wire. Two short pieces of brass tubing are soldered to the rim of the tin as shown. A piece of calico is sewn on to a 6 in. square copper wire frame, the ends of which are fixed into the short pieces of tubing soldered to the rim of the tin. A portion of the calico hangs down to the bottom of the tin, which is filled with water to a point marked zero on a

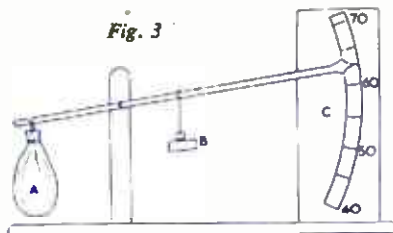


Fig. 3

A quantity of seaweed in a muslin bag (A) is attached to one end of a light wooden pointer. The weight (B) is moved along the pointer until it is horizontal. Take the humidity reading of the paper hygrometer and mark it on the paper scale (C) opposite the pointer. Calculate the remainder of the scale by comparison with a paper hygrometer from day to day.

Fig. 4 shows another type of hygrometer, in which the figure of a woman appears in dry weather, and the figure of a man, with umbrella up, appears in wet weather. Make a simple cardboard model of a house. Mount coloured cardboard figures of the man and woman on a light piece of wood, to the middle of which is attached a piece of catgut violin string, the other end of which should be firmly fixed in a hole in the wooden chimney. Test the action of the catgut, before mounting the figures, by moistening it on a dry day and observing which way it makes the piece of wood turn. All hygrometers should be used in the open air, preferably in a thermometer screen.

The length of a human hair, which has been freed from grease by washing it in a dilute solution of washing soda and warm water, and then thoroughly rinsed in clean water, increases as the humidity increases and becomes shorter in drier weather. A bundle of such hairs knotted together at the ends can be used to make a simple hygrometer. (T.A.T.)



# STENCILS

from old



LOOK old Christmas cards need not be thrown away when the festive season is over. Many of them can be saved for later in the year when the children can cut out the pictures for use as small calendars. The pictures are pasted to pieces of card and small calendar pads attached. Use pieces of ribbon for hanging.

The most suitable cards may be sorted out for converting to stencils for decorative purposes. You will be able to use them for decorating such things as lampshades, table mats, money boxes, waste paper baskets, etc.

The diagrams in Figs. 1 and 3 show two pictures which are suitable for conversion. If you compare them with Figs. 2 and 4 you will see at once how the design is carried out. Note that the black portions of the stencils are the pieces which are to be cut away.

The method of working is to lay a sheet of tracing paper over the picture and roughly mark out the parts which are to be cut away in the stencil. You

of colour in the original and arrange it so that these and the shadows appear in the stencil. This principle is clearly seen in Figs. 1 and 2.

When tracing the outlines you must remember that unless 'ties' are provided the pieces may fall out when the stencil is cut. An example of the 'ties' is indicated in the enlarged picture of the pansy in Fig. 5. Notice that the 'ties' are merely thin bridges which prevent

Hobbies metal cutting saw. For general purposes, however, it will be found that parchment such as is used for making lampshades is ideal. It is impervious to moisture and will not break up when water-colours or poster paints are used. Use a broken razor blade or a modelling knife for cutting the paper or parchment.

Special stencil brushes may be purchased if the amount of work warrants it, but for occasional work an old shav-



Fig. 1

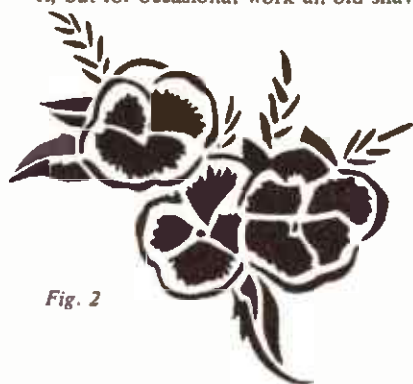


Fig. 2



Fig. 3

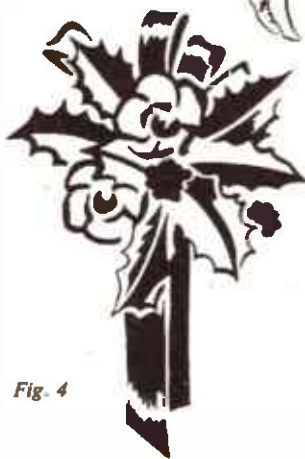


Fig. 4

could black them in with a soft pencil or you might prefer to use a brush and indian ink. Compare the holly leaves in Fig. 3 with those of the stencil in Fig. 4. You will see that each leaf is interpreted in terms of shadow. Thus one side of the leaf is cut away and the other side merely outlined. Pick out the masses

the various pieces from falling out.

When you are satisfied with your picture it should be transferred to the stencil material by means of carbon paper. The material may consist of any thin card, tough paper or even thin metal. The latter may be cut with a

ing brush may be cut down with scissors and will be found most suitable.

Colours may be oil paints, water-colour or poster paints. The latter are most suitable since the colours are dense and dry perfectly flat without brush marks showing. (M.h.)

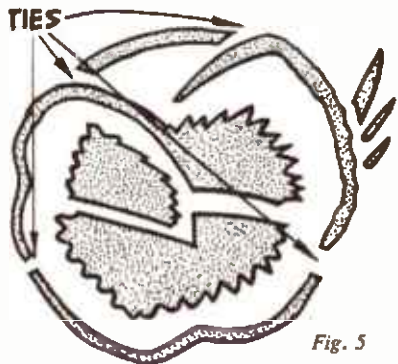


Fig. 5



**F**AN collecting is so engrossing and diverting that people from all walks of life have tried their hand at it. Many have found it so absorbing that they have made it their permanent pastime.

In Japan — where they are universally used — fans are of great importance and have a wide range of utility. The Japanese are not only the greatest fan makers in the world but the originators of two of the most attractive and convenient forms. With them the fan is not a mere appendage to feminine costume, but in its more serious adaptations it belongs to the province of the male and has been put to a number of unusual uses. Furthermore, through the centuries its surface

has been adorned by great painters, calligraphers, and poets.

In Japan fans are divided into two general classifications: the round fan (uchiwa) and the closing fan (ogi or sensu). The round fan was introduced into Japan from China by way of Korea.

## THE HISTORY OF FANS — *By R.L.C.*

Many legends are told about the origin of the fan. One of the most charming is that of the Chinese mandarin's daughter,

who at a festival removed her mask, which was worn by Chinese ladies of the upper class 2,000 years ago, and began to fan herself. She looked so charming that other members of her court followed her example and so the fan was born.

### Used in battle

During a period of evolution a handle was added to the chin of the mask and finally it was made flat with eye slits, and given the name of 'benmen'. From this the Japanese developed a heavy wooden fan carried by umpires at Sumo wrestling and the round battle fan made of metal and sometimes covered with leather. This type of battle fan reached the height of its popularity in the sixteenth century.

The closing or folding fan was invented by the Japanese and some say it was inspired by the mechanism of a bat's wing. The use of this type of fan spread from Japan to China and thence to Italy. In the sixteenth century Catherine de Medici carried a folding fan on her journey from Italy to France and soon afterwards fans of this style began to appear in other parts of Europe.

The different kinds of fans used in Japan at one time or another run into an almost unbelievable variety. There are seasonable, ceremonial, wedding, war, court, kitchen, dancing, singer's, tea ceremony, roof raising ceremony, map, advertising fans, and others too numerous to mention.

## The Snowflake Theme

**A**S winter scenes and snowy landscapes are often depicted on stamps, it is well to remember that snowballing, fort building, sliding and sleighing are not the only enjoyments to be obtained from the snow. Snowflakes are made up of beautiful crystals. In each storm, and in different parts of the same storm, there are presented new patterns of the little flakes.

### Beautiful shapes

Without visual aid we can see much beauty in the flakes as they fall on our clothes. By examining them with a pocket lens, on a piece of black cloth or card, we can see still more, and can easily make a sketch of the forms.

In some storms the crystals are large and feathery, in others solid like tiny balls; often they are little rough, glistening icy needles. Many present beautiful and intricate floral designs, some of which are very rare and well worth the trouble to hunt for them.

To collect them, press a broom-splint lightly upon the edge of the crystal; it will stick and can then be transferred to

a card or glass for examination or drawing.

In severe snowstorms or blizzards crystals are found in great numbers, especially if the wind is from the west or north. Then the crystals fall singly, in good form for inspection; for they are not likely to become clustered into those large flakes that float down in the still air like big feathers often seen when the storms are less severe.

Hobbyists will find snowflake pattern-

drawing an interesting and profitable pastime. Their sketch book should provide numerous and original designs for fretwork, rug-making, etc. Here are some appropriate stamps:

France 1949, 15 franc blue — Winter (1/- mint). Austria 1954, 1 schilling 20 groschen blue — Avalanche (9d. mint). Greenland 1945, 30 ore brown and blue — Dog team and Arctic landscape (1/3 mint). Finland 1945, 4 mark 50 penni blue — Ski-ing (6d. mint). St. Pierre and Miquelon 1938, 2 cent green — Winter Landscape (1d. mint).





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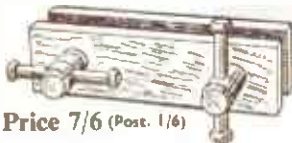
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# Replies to Readers

## Is this YOUR Problem?

### Printing Solution Formulas

**C**OULD you please let me have a formula for a light sensitive solution? I wish to make some plans from a master copy on the same principles as blue prints. (L.E.—Richmond).

**T**WO solutions are needed for blue-prints, and both should be stored in amber bottles. The solutions are (1) 1 oz. ferric ammonium citrate, 100 grains gum arabic, 4 fluid ozs. water. Dissolve the gum arabic first, by shaking occasionally in a closed bottle with the water. (2) 90 grains potassium ferricyanide, 4 fluid ozs. water. The solids must be completely in solution in both of these. For use, mix equal volumes, swab evenly on the paper in very dim light and hang to dry under the same conditions. Print until the dark areas are bronzy. Wash by soaking in changes of water until the latter is no longer yellow. Hang to dry.

### Mirror for a Telescope

**C**AN you supply me with any information on how to grind the glass for a reflector telescope which our recently formed astronomical group proposes to construct? Alternatively, please tell us where this information may be gained. (N.D.—Wolverhampton.)

**T**HE process of grinding the mirror for a reflecting telescope is too lengthy to deal with here. An excellent book on this process is published by the Rolls House Co., Breams Building, London, E.C.4, entitled *The Amateur's Telescope*, by W. Elliston. If out of print, you may be able to borrow a copy from your town library, or obtain a second-

hand copy from W. & G. Foyle Ltd, 119-125 Charing Cross Road, London, W.C.2. The book can be recommended as it deals thoroughly with the whole process for the benefit of the amateur unversed in technical terms.

### Painting over Paper

**A**T present our kitchenette has a white paper with red stars on, and we would like to know if you could recommend a paint to go over the wallpaper that will be washable as well as steam- and heat-resisting. (G.G.—Tirphil.)

**Y**OU can paint over the wallpaper in your kitchenette provided it is in sound condition and firmly adhered. Valspar Lacquer is particularly claimed

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to be steam and heat resisting. It dries in two to four hours and can be washed down quite successfully. One coat is usually sufficient, but in view of the porosity of the surface contemplated, it may be well to give two thinner coats. Also in the same range is Valspar Lustre with the same claims but giving a semi-gloss finish.

### Brush Polish

**I**N some of your designs you mention 'brush polishing' after staining a board. What exactly is a brush polish? (H.M.—Stanmore.)

**B**RUSH polish is applied in the same way as varnish, but the constituents differ and give a slightly less glossy finish than with varnish.

### Northern ITV Aerials

**C**OULD you let me have dimensions for an ITV aerial for the Northern transmitter? (R.P.—Wolverhampton.)  
**E**MLEY Moor, Channel 10, would require 27in. dipole, 29in. reflector 11½in. away, 26in. 1st director, 25½in. 2nd director, 25in. 3rd director, 24½in. 4th director, 24in. 5th director, 23½in. 6th director, and 23in. 7th director, with

5½in. between directors. If signal strength is sufficient, some (or all) directors may be omitted. Electronic Precision Equipment Ltd, Sutton Road, Eastbourne, can supply items for Band 3 aerials, etc. The exact lengths used by various makers vary a little according to whether vision or sound frequency is favoured, and wavelength of element spacing.

### Table-tennis Top

**I** HAVE just finished making a table-tennis top, 8ft. by 4ft. which is hinged in the middle. It was made by fixing a large sheet of hardboard over a stout wooden frame. The hardboard was glued and nailed down, and the nails punched and the holes filled with plastic wood. The surface was then glasspapered smooth. When I came to play on it, I found that the ball only bounced properly when it bounced on the hardboard which had the battening behind it. I would like to know what can be done to remedy this, and also with what paint should the table be painted. (D.L.—N.16.)

**A** TABLE-TENNIS top should, if possible, be made from ½in. thick plywood or hardboard. This is preferable to a top of thinner material fixed to a frame. However, as there is a variation in the bounce from the top which you have made, it would appear that additional laths will have to be incorporated underneath, say another four in between the outer and centre laths — one in each corner of the table. This should give a more uniform bounce. The top should be given several applications of matt green paint.

### Making a Battery Charger

**I**F I build a battery charger using a 12V. rectifier and a transformer with 9V. and 15V. tappings, and want to use it to charge 12V. and 6V. batteries — do I install a switch or a resistance? (K.A.—Kidlington.)

**S**OME 9V. to 12V. will be needed to charge a 6V. battery fully, with about 18V. to charge a 12V. battery, as each cell rises to nearly 3V. when fully charged. The usual 12V. rectifier is suitable for charging a 12V. accumulator. It can also be used for 6V. or smaller accumulators. If you apply the full voltage directly to a small accumulator, the charging rate will be too high. To prevent this, you can put a variable resistance, fixed resistance or length of resistance wire in series with the battery. Thin iron wire is suitable. Only a few ohms resistance will be required. Alternatively, if the transformer has other tappings, the charging rate can be kept down for small batteries, by using a lower voltage tapping.

There was a young man from Penzance — who hadn't a clue how to dance!

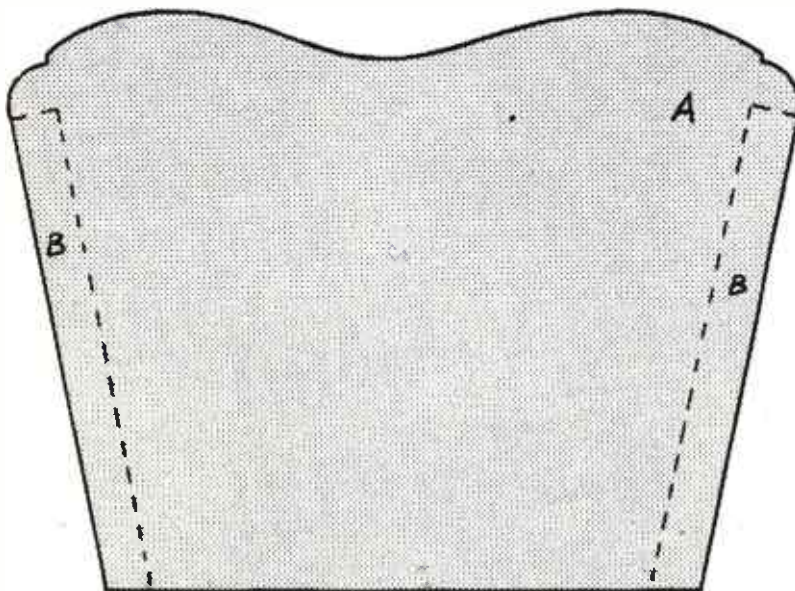
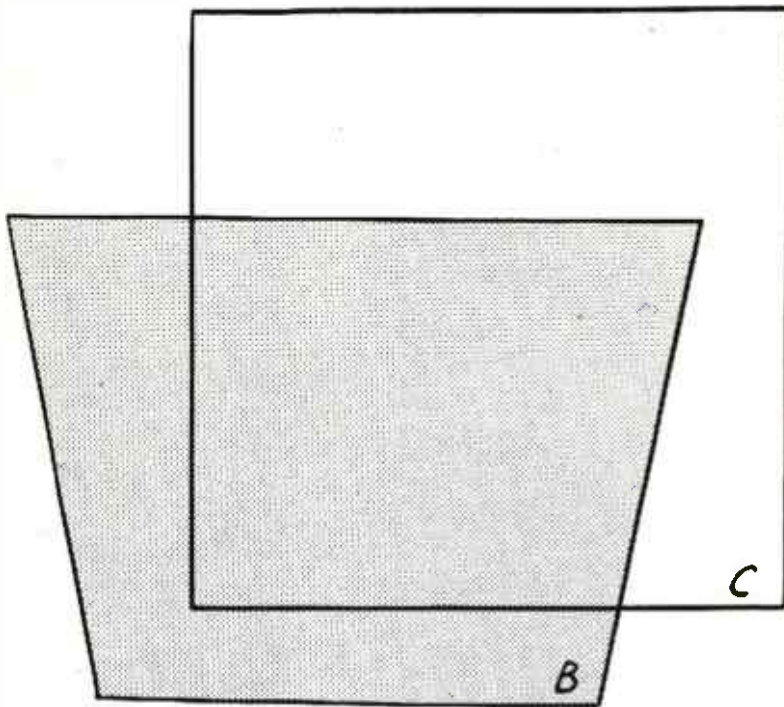
but he sent for our book and in no time — just look!

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# Attractive Hanging Basket



## CUT OUT WITH A FRESAW

**T**HIS attractive hanging basket for an ivy, Tradescantia or any other climbing plant is made from five pieces of wood cut with a fretsaw. Cut two pieces (A), two (B) and one (C), from  $\frac{1}{4}$  in. wood.

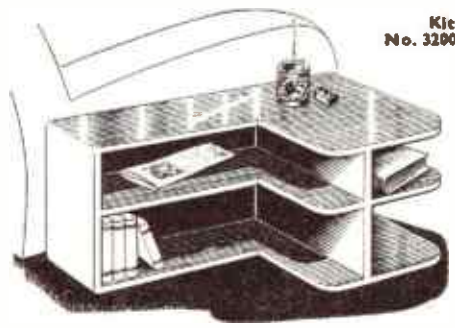
The pieces (B) are glued and pinned between pieces (A) in the positions shown by the dotted lines. Flatten the bottom edges of pieces (A) and (B) after they have been glued together, by rubbing on a piece of glasspaper laid flat on the bench. When the base is flat the bottom (C) is glued and pinned in place.

Insert four screweyes, one in each corner, and to these attach cord or chain of the desired length. The four ends should terminate at a ring bent from medium gauge wire. Brass chain may be obtained from Hobbies Ltd., Dereham, Norfolk, price 8d. per ft. length (postage extra). (M.p.)

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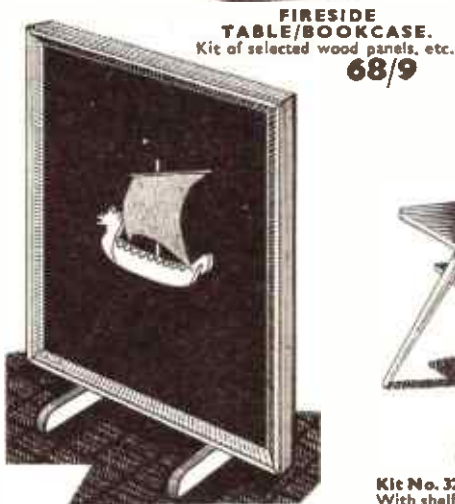
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