

28th FEBRUARY 1962

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THE ORIGINAL  
'DO-IT-YOURSELF'  
MAGAZINE

# HOBBIES *weekly*

FOR ALL  
HOME CRAFTSMEN

**AN ELEGANT  
PIECE OF FURNITURE  
FOR THE MODERN HOME**

*Also in this issue:*

DISC BREAK—  
THE OUTLAWS

DETAILS OF THE  
LATEST STAMPS

SCIENCE TRICKS

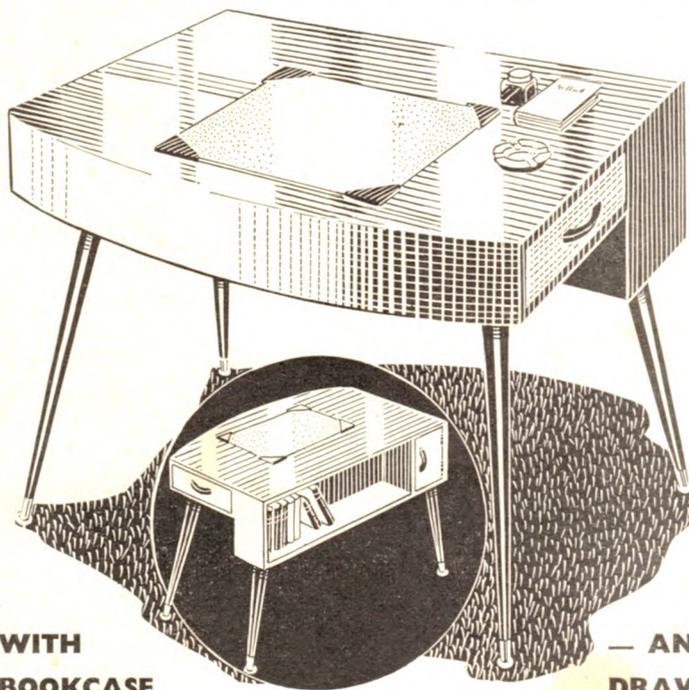
AERIALS FOR  
TRANSISTOR SETS

MAKE CEMENT  
PLANT BOWLS

PANORAMIC VIEWS  
WITH A CAMERA

PATTERNS FOR  
OVERLAY WORK

ETC. ETC



**WITH  
BOOKCASE**

**— AND  
DRAWERS**

## **BOW FRONT DESK**



*Up-to-the-minute ideas*

*Practical designs*

*Pleasant and profitable things to make*

**5<sup>D</sup>**





## 'COIN COLLECTING'

IT is a never-ending source of wonder to the uninitiated that many coins — particularly Roman — can be purchased for only a few pence each. It would be wrong, however, to give the impression that most coins can be bought for next to nothing. Particularly fine specimens of some coins are priced at several pounds each, whilst others, being very rare, may run into hundreds of pounds. But provided you exercise good judgment and discrimination when buying, you can build up a worthwhile collection without spending a great deal of money, and probably also make a good investment.

The purpose of this book by Laurence Brown, who has had considerable experience in handling coins, is to indicate to those who think they may like to start a collection, the best methods to adopt, and to give some general overall picture of the development of coins in each continent set against the historical background. There are valuable chapters on the methods of collecting coins, housing, cataloguing, and preserving.

Published by Arco Publications, 29 Gt. Portland Street, London, W.1 — Price 12/6.



New 'space' pictorials from Bulgaria depicting Pilot Titov and a space ship.



## THE TANGANYIKA COMMEMORATIVES

We gave details last week of the new stamp issue commemorating the Independence of Tanganyika. At the top of this page is a further selection from this issue. The 20/- stamp (above) shows the "burning torch" theme, repeated also for the 1/30c value. The mountain shown in the design is Kilimanjaro.

## Advertisers' Announcements

BRITISH COMMONWEALTH APPROVALS. Fraction Catalogue. Plus 25% discount. — S. Herbert, 75 Shooters Drive, Nazeing, Essex.

FOR SALE — NEWFOUNDLAND STAMPS! 100 fine N.F.L.D. stamps \$1.00 — 1,000 \$9.00 — 2,000 \$15.00 — 50 all different \$2.00 — 100 all different \$6.00 order now from HARRY PHILLIPS SALES, BONAVISTA-2K, NEWFOUNDLAND, CANADA.

100 DIFFERENT stamps free! Request 1d. upwards discount approvals. — Bush, 53 Newlyn Way, Parkstone, Dorset.

FREE STAMP MAGNIFIER plus 35 different stamps. Request bargain approvals. — Walker, 11 Camphill Avenue, Glasgow.

FREE! Stamps catalogued 15/- per approval applicants. 3d. postage. — Pattle, "Pattlesden", Rattlesden, Burd St. Edmunds, Suffolk.

FREE—15 PICTORIALS to all genuine Colonial approval applicants. — Daniel, (Dept. H.), 13 Fox Street, Preston.

## COMMEMORATIVE STAMPS FROM THE NETHERLANDS

ON the occasion of the twenty-fifth anniversary of the wedding of H.M. the Queen and H.R.H. Prince Bernhard, a commemorative stamp (without surcharge) was issued in Holland on 5th January in the denominations of 12 and 30 cents.

The two stamps bear the same representation, namely the images of H.M. the Queen and H.R.H. Prince Bernhard, and the relevant dates 1937 and 1962.

The colour of the 12 cent stamp is red; that of the 30 cent stamp is green. The stamps have been designed by the artist Sierk Schroder at Wassenaar, the lettering and denominations by P. J. J. van Trigt at The Hague.



The stamps will be available to 12th May 1962; they will remain valid for pre-payment up to and including 31st December 1963.



These pictorials appeared on 22nd January from Luxembourg, marking 'The World Championships of Cross-Country Racing for Cyclists'

# AERIALS AND DUAL WAVE

THE kind of aerial which is used for the transistor receiver makes a large difference to the volume obtained. Very small aerials give less signal strength, but have to be used if the set is to be compact and portable. But if circumstances do allow a larger aerial, this will improve reception.

If the receiver is to be completely portable, a ferrite rod aerial is generally fitted. The ferrite rod acts as a core for the tuning coil, and the complete aerial is somewhat similar in operation to the old type of frame aerial, used in valve portables.

When a very simple receiver is employed, a ferrite rod aerial will not give enough signal strength. Some kind of external extended aerial is then necessary. Such an external aerial is also generally needed if the receiver is in a screened position, such as in a vehicle.

## M.W. ferrite rods

Some suitable ferrite rod aerials, for portables, have already been described, but further details should prove useful. The actual ferrite rod itself can be of any size, to suit the receiver. The larger the

rod, the greater will signal pick-up be. This means that the rod is usually the largest which can be easily accommodated. In miniature sets, it may be only 4 in. or so long, while about 5 in. long is popular in many small receivers. When the cabinet is bigger, a 6 in., or even 8 in. rod may be accommodated. There is no point at all in using a small rod, if there is space for a larger one, as the larger rod will give greater volume.

## By 'Radio Mech'

Such rods are available in many sizes, and one about  $\frac{3}{8}$  in. in diameter is often used. The rod is often round, but ferrite slabs are also used.

The rod can be wound to cover the required waveband. This is quite easy for medium waves, but is rather difficult for long waves, when very many more turns are required. It is thus quite a good plan to purchase a ready-wound rod. This may be for M.W. only, or for both M.W. and L.W. reception.

Fig. 37 shows two typical M.W. ferrite rod aerials. With both, the point E goes to the earth circuit of the receiver. As no outside earth connection will be used, this is actually the battery positive circuit.

With one rod, the tuned winding is tapped, and the tapping D is taken to the detector, which may be a crystal diode, or a transistor. With the second rod, a small coupling winding is provided instead, lead D again going to the detector.

If the aerial is to be for M.W. only, either a tapping or a coupling winding can be used. But if long waves will also be tuned, it is often convenient to have the coupling winding. Most ready-made ferrite rod coils have this coupling winding.

If a circuit shows the detector connected to a tapping, it is generally in order to take the detector to the coupling winding, instead. The ready-made winding will, of course, be the correct size for the rod. It will generally be wound with Litz wire, which has several separately insulated strands, and which gives slightly better results than ordinary

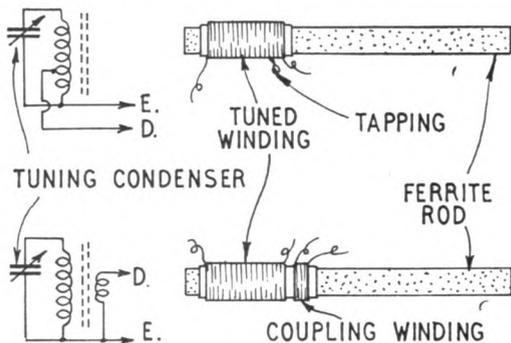


Fig. 37—Two medium-wave rod aerials

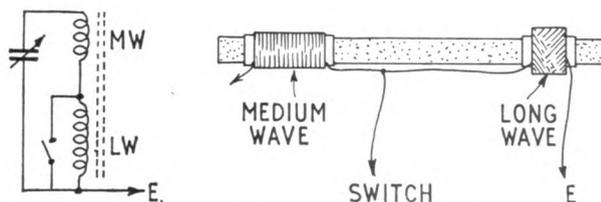


Fig. 38—Two-waveband ferrite rod aerial

single insulated wire.

A ready-made medium wave ferrite rod aerial can thus be used in any of the circuits so far described. In regenerative circuits, a further small winding is generally necessary. This can be of ordinary thin insulated wire (such as 28 s.w.g.), and can be added without much difficulty.

## Dual-wave rods

In many parts of the country long waves are necessary, to receive the Light Programme, or other L.W. stations. A dual-wave rod, such as that in Fig. 38, will then be suitable, as it allows tuning over both medium waves and long waves.

In Fig. 38, the M.W. winding is working alone, when the switch is closed, and this provides M.W. tuning. When the switch is open, the M.W. and L.W. windings are in series, for L.W. reception.

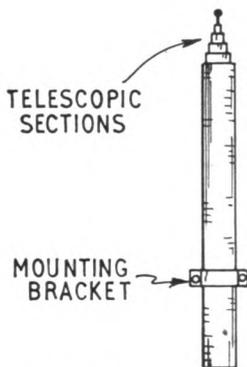


Fig. 40—An extending rod aerial

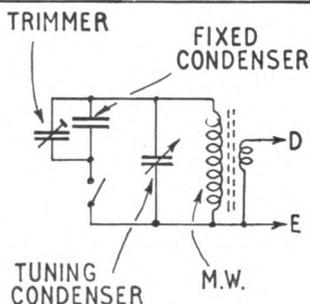


Fig. 39—Extra capacity for 1500 metres

The L.W. winding is usually some distance from the M.W. section, to avoid loss of efficiency on the M.W. band. The two windings are so connected in series that all turns are in the same direction.

Coupling windings will also be present — a small one by the M.W. coil, and a slightly larger one near the L.W. coil. These coupling windings feed the detector or first transistor, exactly as with the medium wave aerial.

The actual bands covered depend to some extent on the receiver design, but will usually be about 200 to 550 metres for medium waves, and 1,100 to 1,900 metres or so for long waves. Very small tuning condensers are often used in transistor sets, so that the actual coverage is a little smaller than with valve or other larger receivers.

### Capacity loading

With small transistor sets, long waves may be required for the reception of the Light Programme on 1,500m. only. If so, the set can be simplified by adding extra capacity to the medium wave aerial winding, until it tunes to 1,500m.

This method has the advantage that no L.W. winding is needed on the rod. Signal strength is smaller than if a L.W. winding is employed, but is usually good enough in areas where the L.W. Light Programme transmitter is well received.

Fig. 39 shows the circuit for this method of working. The tuning condenser is as originally fitted, and tunes

medium waves. When the switch is closed, a fixed condenser and trimmer are in parallel with the coil. It is necessary to use a fixed condenser because much more capacity is wanted, than could be obtained from a variable condenser. The trimmer allows some adjustment, and can have a maximum capacity of about 500pF (·0005 $\mu$ F).

The total capacity needed is quite large, compared with that usual in tuned circuits. It will generally lie between about 1,500pF (·0015 $\mu$ F) and 2,000pF (·002 $\mu$ F). A 1,000pF fixed condenser, plus the 500pF trimmer, and original tuning condenser, will usually suffice.

The tuning condenser is set nearly closed, and the trimmer is then adjusted until the Light Programme is tuned in. Operating the tuning condenser will not give normal L.W. tuning, with this circuit, but will act as a kind of variable trimmer, for the 1,500m. transmitter. That is, L.W. reception is confined to the Light Programme only.

If a number of fixed condensers of about suitable capacity are to hand, one may be chosen which will allow 1,500m. to be reached without a trimmer. Fixed condensers may vary from the marked value. This is normally unimportant, but does mean that the exact capacity has to be found by trial, in the circuit in Fig. 39.

### Extended aerial

Some form of aerial outside the receiver will increase volume, as men-

tioned. Such an extended aerial does not need to be very elaborate, but can be made from a few feet of thin flexible wire. The wire is placed in any convenient position, such as behind furniture, along the floor, or rising to a picture or other supporting point.

A 'throw out' aerial of this kind is particularly useful for small receivers, and can increase volume considerably. The set can still be easily carried from one position to another, but is not completely portable in the same way as when no external aerial is used.

The aerial wire is connected to the end of the aerial winding on the ferrite rod. If the receiver uses any form of ganged tuning, a very small condenser is included in the connection, at the receiver.

A self supporting rod aerial may also be used. One of these is shown in Fig. 40. They are available in various sizes, being about 6 in. long when closed, and 30 in. when opened. Such an aerial may be fitted inside the receiver cabinet, projecting slightly through a hole in the top. It can then be extended, or pushed back, as wanted. If there is no space inside, the aerial could be screwed on the outside of the cabinet, at the back.

This type of aerial works in the same way as the 'throw out' wire described, but stands upright, and does not need any other fixing point. As with the 'throw out' aerial, it allows better volume from any particular circuit, or more long distance reception.

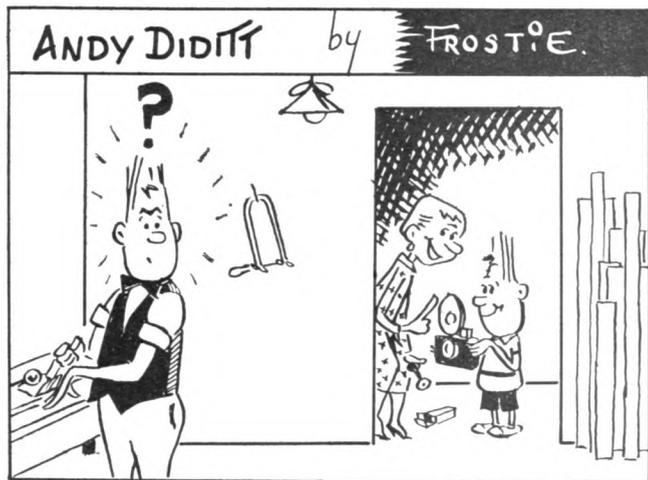
## Repair of Electrical Appliances

THIS is a very handy book for the man who wants a clear insight into how domestic electrical apparatus works, how to find faults, and how to carry out repairs. Suffice to say that it is written by F. G. Rayer, an authority on electronics and well-known and appreciated as a contributor to *Hobbies Weekly*.

Apparatus covered ranges over a wide field, including baby alarms, batteries, bed warmers, bells, electric blankets, boiling rings, cistern heaters, hair clippers, clocks, cookers, electric tools, electro-plating, photography, immersion heaters, electric irons, kettles, all types of lighting, different types of electric motors, refrigerators, sewing machines, vacuum cleaners, washing machines and spin driers.

Radio, television and electrical circuits of motor cars are also covered and great stress is laid throughout on the safety factor.

Published by Arco Publications, 29 Great Portland Street, London, W.1. Price 12s. 6d.

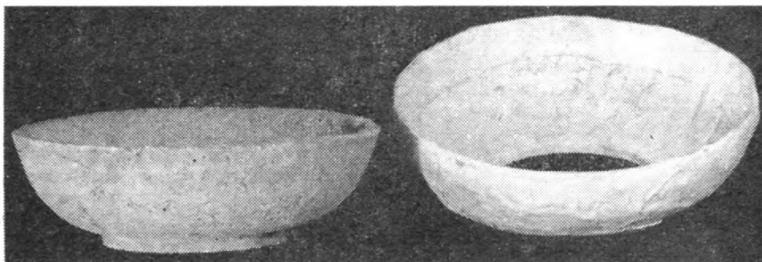


"YES! I'VE LOADED IT — BUT I WANT YOU TO SHOOT HIM."

# Making Cement Plant Bowls

IT is quite easy and extremely satisfying to make up one's own containers for bulbs, bowl gardens, etc. Of course these can be made from pottery, but unless this happens to be a hobby, it is rather beyond the means of the average person. The containers to be described are all made from a cement mixture, and although the natural colour is of course light grey, they may be painted on the outside, if required.

One of the easiest methods of making a cement bowl is to work from a papier-mâché mould, which will itself need to be made up, but one mould, carefully treated, will suffice for dozens of bowls. The first thing to do is to select as a model a suitable dish or small bowl. This may be either of glass, metal or plastic and will not be harmed in the process. The bowl should be turned upside-down,



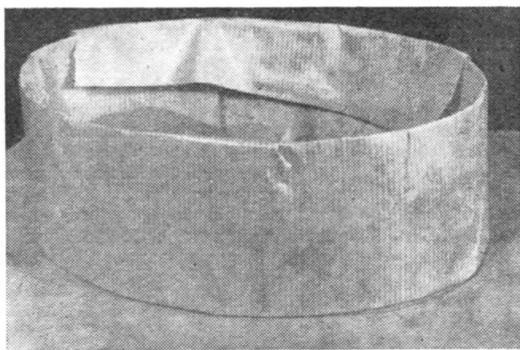
*Bowl and mould from which it was made*

difficult, two or more pieces of paper may be used. Wrinkles are unavoidable, but they can be smoothed down and will not matter. Any excess of paper should be trimmed away at the edge of the bowl.

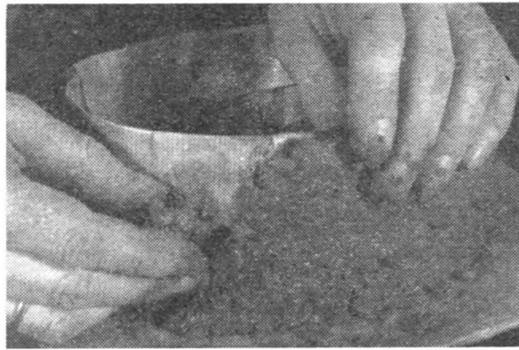
A quantity of pieces of torn-up newspaper, about two inches square should

to dry completely. It can then be gently eased from the bowl and the edges trimmed.

A circular hole, about 4 in. in diameter, according to the size of the bowl, is then cut in the bottom of the mould, as shown in the photograph. This gives a base to the



*Paper-covered aluminium strip*



*Plastering cement on aluminium mould*

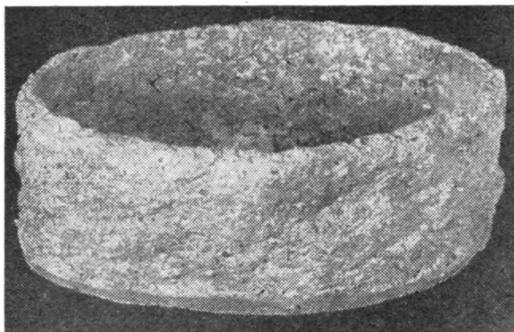
preferably on a sheet of glass, and the outside given a thin coating of Vaseline. A piece of newspaper, large enough to cover the entire bowl, is then soaked in water and pressed on to the bowl. If the latter is of such a shape as to make this

be soaked in water for several hours preferably overnight. The first paper, covering the bowl, is now pasted, and pieces of soaked paper placed over it, pasting each piece down as it is laid. Decorator's cold water paste, sold in small packets, is ideal for this. Layer after layer of paper should be added, each one being thoroughly pasted before adding the next.

Since this is a somewhat boring occupation, it need not all be done on the same occasion; it does not matter if the partly completed mould dries out in the meantime. A total thickness of paper from  $\frac{1}{2}$  to  $\frac{3}{4}$  in. should be aimed at, and when the mould is completed, must be allowed

finished container, and also makes it easier to remove the latter from the mould. The edges of this hole and the top of the mould should be bound with paper tape as a reinforcement, and the whole given two good coats of shellac varnish.

To use the mould, it should be rubbed over on the inside with an oily rag, to prevent sticking, and a cement mixture made up. A suitable mixture is two parts of sharp sand, one part soft sand, and one part of cement. Experience will show how much is required for a particular sized bowl. This should be thoroughly mixed and sufficient water added to produce a stiffish paste. A piece of newspaper is placed on a sheet of glass and the mould stood on it. Sufficient cement is then put at the bottom to fill in completely the cut away portion, and cement



*Container with 'rough cast' outside*

● Continued on page 351

# THE PURSUIT OF HOBBIES

**A** BOY'S hobbies should be hobbies. No boy should tie himself down to just one hobby and put all his spare time into it, for, as in many cases, this hobby tends to become all his life. It becomes a growing menace to his social life in society. No! A boy should not stick to one hobby, and neither should he keep a hobby too long. To have really lived is to have tried a little of everything.

Don't come up with the old excuse of not being suited for other hobbies other than your present one. Of course you are.

A great friend of mine once told me that over the past thirty years he had tried as many as three hundred different hobbies. All of which he said gave him much pleasure and knowledge. This I did find hard to believe until he showed me how he had come by these hobbies, which were generally inexpensive and required little knowledge.

## Making a start

He did not just run through a list of hobbies at random, for he had a distinct method of selection. Starting with his one hobby, he found that this began to run into another, and his original interest was replaced by something more exciting.

Let me begin to explain more clearly by giving an example. Take in this instance a boy who has an interest in the history of his home town. A start would be reading through the early parish registers or the council minute book. Most probably he would come across books that contain some old maps of his town and discover that it is believed the Romans camped somewhere in the area in the year something or other.

His hobby of local history is now on the slide. His interest is now being diverted to archaeology. But as he doesn't know much about this subject he joins a local Archaeology Club or Society. Failing this his move would be towards books in this line from his library. The days go by in his new study until he begins to 'dig' for matter that might reveal the past customs and way of life. The soil he inspects with microscopic attention, studying pebbles, shells, pieces of baked clay and even grains of sand. Not surprising is it that after some time he begins to notice that the soil not only holds ancient matter but it also acts as a home to many forms of life that he had no knowledge of.

Shapes, colours, patterns, representing minute variations of life begin to fascinate his curiosity. Once again, as before, his hobby is on the turn. Archaeology has made a gradual slide into the study of insect life. Studying insects can, after

some time, be rather difficult without a microscope. So saving up some pocket money he buys himself a cheap microscope, to enable him to observe more closely and clearly the pattern of life. Books come into use again to aid him in the study and means of distinguishing between various specimens.

Now our imaginary boy has a microscope, he inevitably puts it to its full use, gathering material in the minute world. Bacteria is what he would then come across in chemical compounds. Crystals of chemical compounds are also what the book says he should study. Of course to really understand what is going on he acquires all necessary knowledge of a few formulae. 'Isn't it marvellous how these chemical compounds are worked out in figures before they are made?' he begins to think to himself. Wishing to understand more he gets deeper into the study of chemistry.

See how he has moved on with his only encouragement — his curiosity for the unknown. He has not in any way disregarded a hobby up to now. What he has done is to have gone deeper into a subject so as to lose his original intentions. Just think how bored he could have been after, say, a year with his original hobby.

Now he is on to a hobby that is fascinating, amusing, adventurous, and I must say dangerous to the too enthusiastic beginner. Here again the mysteries of life are revealed. Our subject is really enjoying himself converting common substances into scientific data which he systematically analyses. As well as

studying salts, carbonates, etc., by splitting them down into their respective elements, he builds a few compounds, starting with the more commonly known arrangements and working up to complex structures.

From chemistry he can branch out into many fields, creating a desire for more interesting hobbies. There is no limit to the number of hobbies he could pass through. You too!

## Branching off

Try looking at the hobby you have now from a critical point of view. Haven't you had an evening when you thought about abandoning your hobby and taking up something else? Well there is no need to give it up at all. See it branches off into other hobbies, and follow these up, before long you will find that you have increased both in pleasure and knowledge.

There is an inexhaustible number of hobbies to be enjoyed. If you don't already have a hobby start with any that you may see in this magazine. Even if you think it dull, by branching off into other hobbies you will eventually reap the benefit.

I must emphasize the way books play an all-important part in your hobbies. You can learn a tremendous amount from reading. Much more than you could possibly obtain by practical experience. Reading is a necessary accompaniment to all hobbies. So obtain books on a great variety of subjects. You may decide to start studying the print or the paper. Well, we are off again! (D.K.)

## ● Continued from page 350

## CEMENT PLANT BOWLS

is plastered around the inside of the mould to a thickness of about  $\frac{1}{4}$  in. This is best done with the fingers and is rather messy, but rubber gloves can be worn, if desired. Care should be taken to ensure that the side covering is continuous with the bottom. Finally the cement is smoothed by brushing over with a wet paint brush.

After about two days the bowl can be removed from the mould by lifting it away from the glass plate and gently pushing the bottom. It should not be used until the cement has turned a light grey colour. If a drainage hole is required it should be made by pushing a pencil into the bottom on the glass plate before the cement has set.

Another method of making bowls, straight sided ones this time, is to obtain a strip of aluminium about 3 in. wide and

bend it to a circular or oval shape) fastening the ends together by means of wire through holes. This is then covered with paper (see photograph). A piece of paper is placed on a glass plate as before, and a  $\frac{1}{4}$  in. layer of cement laid on it to cover a little more than the same area as the mould. The paper covered mould is then placed on the cement layer and further cement plastered on the outside this time, finally finishing with a wet brush, as before. When dry, the bowl can be removed by unfastening the aluminium strip and pulling it out. The paper covering will prevent sticking.

If a rough-cast finish is required, do not smooth the outside but leave it irregular. By bending the aluminium strip to different shapes, various types of bowls can be made — D-shaped, heart shaped, kidney shaped, etc. (P.R.C.)

Complete with Bookcase

# A BOW FRONT DESK

USING the latest ebonized slim legs with ferrules and glides, this combination desk and bookcase (shown illustrated on the front page) is a really worthwhile project. The top is covered with a standard sheet of Waverite to provide a really attractive and hardwearing surface.

Since the top A is to be covered, the best material to use is  $\frac{1}{2}$  in. plywood, which can be cut in one piece without resorting to battens, etc. The piece B, too, can be plywood of the same grade as the top. Except for the drawers, which are detailed separately, all parts are of  $\frac{1}{2}$  in. wood.

Study the diagrams carefully before making a start, and take your measurements from the drawings in Fig. 1. You will see that the overall dimensions are  $35\frac{1}{2}$  in. wide,  $23\frac{1}{2}$  in. deep and 30 in. high. This allows you to use a standard

36 in. by 24 in. sheet of Waverite, and also gives the correct working height for the desk.

Fig. 2 shows how the main pieces are put together. You will, of course, use screws and glue throughout. Notice how the top is cut away to receive the sides of the bookcase. The position of piece E is rather critical. It should be fixed as shown, so as to allow it to be shaped at the ends to conform to the curve of A and B.

Next continue by adding the sides of the bookcase G, as seen in Fig. 3. You will see in this sketch that piece E has already been shaped. Add the partition H in the cabinet portion, and also make and fit the door (Fig. 4). The door will be strengthened by the addition of battens ( $\frac{3}{4}$  in. by  $\frac{1}{2}$  in.) of stripwood at the back. Hinge the door, and recess the hinges for a close fit. The front is finished off by

fixing a piece of  $\frac{1}{8}$  in. veneered plywood, as seen in Fig. 4. Bend it round, and glue in position. It should be bound in place until the glue is dry.

The Waverite panel is stuck to the top, using a suitable adhesive as suggested in the maker's instructions. It is not a difficult operation, but you should be careful to ensure that sufficient weights are placed in position while the glue is drying. Pay particular attention to the edges, making sure that there is sufficient

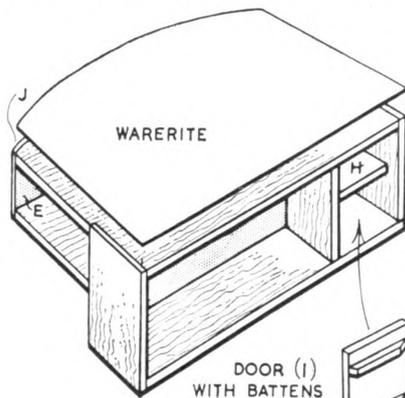
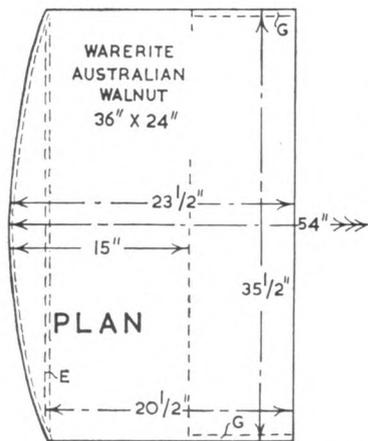


Fig. 4

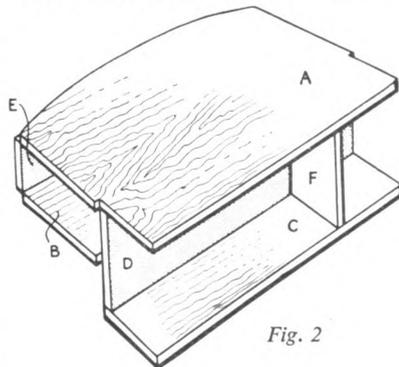


Fig. 2

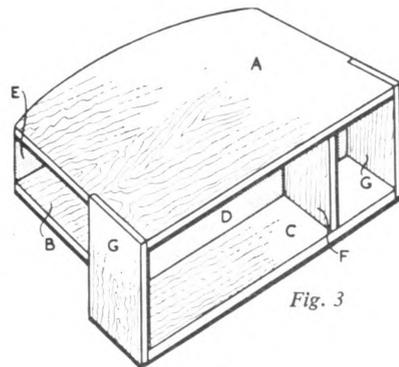


Fig. 3

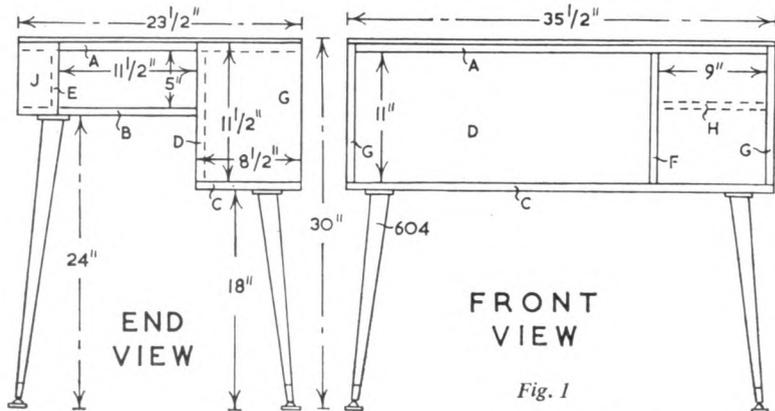


Fig. 1

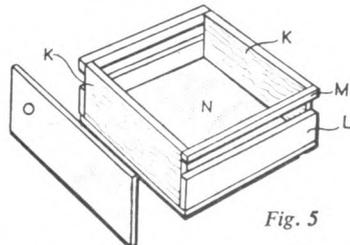


Fig. 5

glue here for a good joint. Allow the panel to overlap very slightly, and then trim off with a plane.

● Continued on page 353



playing of Charles Hodges and the C. & W. style of Reg Hawkin's rhythm guitar. Charles and Reg have worked together for many years carefully studying to achieve the high standard of playing they produce today. Billy Kuy's lead guitar produces the commercial 'twang' that teenagers of today enjoy so much. The whole combination is skilfully knitted together by the unique drum playing of Bobbie Graham, who is known also in the jazz world for his outstanding playing.

The Outlaws' first disc on H. M. V. was entitled *Swingin' Low and Spring is Near* (45-POP 844).

## THE OUTLAWS

**T**HE Outlaws' — the British group with a new Country & Western sound — are not exactly new to the trials and tribulations of show business. They have been playing together for over a year in local dance halls, Butlin's Holiday Camps and youth clubs, and with concentrated enthusiasm and talent they have won for themselves a fine reputation.

**BILLY KUY** plays lead guitar. Billy is 19 years old and has been playing for about 3 years, mostly on TV, and he has also appeared several times on the same bill as Cliff Richard.

**REG HAWKINS** is a keen collector of C. & W. music . . . he plays rhythm guitar for The Outlaws and before he joined them had been playing local halls for three years.

The youngest member of the group is seventeen-year-old **CHARLES HODGES** who plays bass guitar, and twenty-year old **BOBBIE GRAHAM** is the oldest. Bobbie was playing drums for nine years before he joined the group, so he is considered to be quite an expert.

The Outlaws are immediately recognizable by their unusual rhythm sound which is derived mainly from the bass



● Continued from page 352

## MAKING A BOW FRONT DESK

The construction of the two drawers — one at each end — is seen clearly in Fig. 5. The front and back K, and the sides L and M, which also form the runners, are all  $\frac{1}{2}$  in. thick, but the bottom N and drawer front O need only be  $\frac{1}{8}$  in. or  $\frac{1}{4}$  in. The sides of the drawer could be lined with  $\frac{1}{8}$  in. hardboard to finish off. Allow the front O to overlap

about  $\frac{1}{4}$  in. all round. Drawers will, of course, run on strips glued to E and D.

For finishing, all woodwork should be stained after cleaning up with glass-paper. Stop holes, and fill the grain in the usual way; then polish or varnish.

The legs are added by screwing the special plates in position underneath. The legs themselves are then screwed in.

Add handles to drawers and cabinet.

The legs, handles, and Waverite may be obtained from Hobbies Ltd, Dereham, Norfolk, and from any branch or stockist. The prices are: Waverite Australian Walnut (36 in. by 24 in.) 30s. 0d., post free; two No. 604 ebonised legs with ferrules and glides (24 in. long) 11s. 6d., and two (18 in. long) 9s. 0d.; three black handles No. 711, 1s. 6d. Postage and packing on handles and legs 2s. 0d. Legs and handles will be sent post free if ordered with the Waverite. (M.h.)

# FIRE-FIGHTING SCIENCE

INDUSTRY, transport and the comfortable running of our daily lives at home, all depend upon combustion in some form or other. But fire out of control is a terrible destructive force, that can ruin hundreds of lives at a single stroke, or consume a great forest and convert the region into an arid wilderness.

*By A. E. Ward*

Combustion can occur if three primary conditions are met with. There must be a combustible material, or fuel, a good supply of oxygen, or air, and enough heat energy to turn some of the fuel into a gas at a temperature called the kindling temperature for that material. Thus petrol, which vaporizes easily and has a low kindling temperature, is a highly dangerous inflammable chemical whilst coal will require a considerable quantity of heat before it will attain its kindling temperature in a gaseous state. Fire fighting and prevention methods depend upon removing one or all of the conditions under which combustion will take place. The cheapest, most ancient, and generally the most efficient fire-fighting material is water.

Water itself is non-inflammable and cold water will absorb huge quantities of heat energy in being raised to its

boiling temperature, and then greater amounts of energy will be needed for all the water to be converted into steam. Other liquids are not so effective in this respect. Try this experiment. Take two headless matchsticks and soak one in water and the other in carbon tetrachloride solution ('Thawpit'). Hold each wet match against a candle flame at the same moment and note which of the wooden sticks catches fire first. Carbon tetrachloride vaporizes quickly and soon dries out, but several seconds will elapse before the water boils away and the water-wetted match takes fire. Water is most useful for drastically lowering the temperature of burning materials, and it also helps to smother the fire by cutting off the supply of oxygen.

Smothering is another important fire-fighting technique. Place a teaspoonful of bicarbonate of soda into a drinking glass and add a quantity of vinegar. The acetic acid in the vinegar will react with the powder to form carbon dioxide. When the tumbler is filled with gas, pour the invisible carbon dioxide on to a candle flame. The candle will be extinguished. Heavy non-combustible vapours like carbon dioxide are particularly useful when fighting oil fires, or fires caused by faulty electrical installations. Artificial fog, pumped from a machine operating like an elaborate scent spray, is sometimes employed to smother fires in buildings. A person whose clothing accidentally catches fire should immediately be wrapped in a blanket or carpet, if other fire-fighting materials are not to hand. Such fires may also be extinguished if you make the victim roll vigorously on the floor, in an attempt to rob the flames of air.

Strong walled fire extinguishers are often filled with carbon dioxide which has been liquefied under high pressure. When the appliance is operated, the pressure is released and the liquid rapidly vaporizes as it issues from the nozzle. In the common soda-acid type of extinguisher a small bottle of sulphuric acid is kept apart from a large volume of bicarbonate of soda solution. When the extinguisher is inverted and struck against the ground, a plunger breaks the bottle and permits the acid to react violently with the bicarbonate. Carbon dioxide gas is liberated, which forces the liquid through the nozzle.

You can make a working model of a soda-acid fire extinguisher, using a bottle with a well-fitting cork, a small test tube which will fit inside the neck of the bottle, and a long piece of thin glass tubing which is bent through ninety degrees at a point 3 in. from one

end (see Fig. 1). Bend the glass over a hot Bunsen flame.

Bore a hole through the cork, to take the glass tube, and attach a length of thread to the rim of the test tube. Insert the long arm of the tubing into the cork. Two-thirds fill the bottle with a solution of bicarbonate of soda in water. Place a small quantity of strong sulphuric acid into the test tube. Lower the tube into

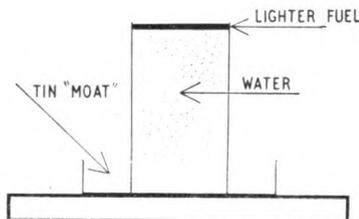


Fig. 2—Dealing with petrol flames

the bottle and press in the cork with the tubing, in such a manner that the cork prevents the string slipping too far into the bottle, because the contents of the tube must not yet be allowed to mix with the bicarbonate solution. Take the model out of doors. To operate the extinguisher turn the bottle upside down and direct the nozzle away from you. The carbon dioxide generated when the two chemicals come together is sufficient to force the liquid for a distance of 10 ft. or more. Support the cork with your fingers to prevent it being blown out by the pressure. You will also naturally take extreme care when handling the acid.

The liquid ejected by a soda-acid fire extinguisher is very corrosive and will damage paintwork and curtain materials, so it should only be used in a real emergency. Furthermore, the solution is a good conductor of electricity, so the extinguisher should never be used against electrical fires. Prove this yourself by rigging up a simple electric circuit, incorporating a flashlamp bulb, battery and a small jar containing two brass strips separated by a block of wood. The components will be wired in series and the ends of the wires will be fixed to the respective brass strips. Thus the jar will form a gap in the circuit. Pour some of the soda-acid mixture into the jar and observe the result. The gap between the brass strips will be bridged by the liquid and current will flow and light the lamp.

Electrical fires may be fought with carbon dioxide gas, carbon tetrachloride, or foam (sodium bicarbonate plus

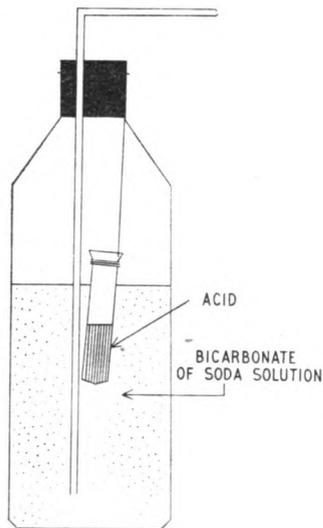


Fig. 1—Soda-acid extinguisher

● Continued on page 355



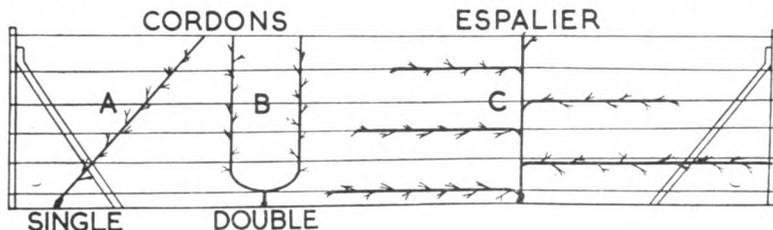
**M**ANY fruit trees are so ornamental during the flowering season that they can be used to good effect in the flower garden. Dwarf trees are quite suitable for small gardens and trained trees can be used to good advantage for screens.

Most gardens can be made to grow fruit and there are few soils which cannot be made to produce good crops if care is taken in preparation. Even in town gardens where apples, plums and pears are not suitable where there is complete shade caused by trees or buildings, morello cherries can be grown quite successfully. Trained trees occupy a minimum of space and will bear fruit fairly quickly.

There is no point in growing a greedy privet hedge as a screen when you can

## DUAL PURPOSE FRUIT TREES AND BUSHES

more easily grow loganberries or raspberries. Both make a fine screen in the summer and can be pruned in winter when the plants are dormant. A privet hedge demands more attention and produces nothing for your trouble.



Cordon trees, too, as shown at A and B, are extremely useful for dividing screens. They can be planted alongside paths and trained, with one or two main stems. Being grafted on dwarfing stock

they are admirable for this purpose and crop heavily if properly trained and pruned. Pruning is not difficult and there are many books giving the novice detailed instructions.

Apples are used as cordons in many gardens but red currants and gooseberries can also be trained in the same way. They are perhaps a little more difficult to train, but are certainly not beyond the capabilities of the keen gardener. Pears, too, can be used in a similar way but these are usually grown as espaliers (shown at C).

Prepare the soil well before planting and your trees will get off to a good start. Deep digging and manuring are the secrets of success. Break up the subsoil to provide free drainage and a deep root run.

Trees may be planted any time from early October until late March depending of course upon weather conditions. Late planted trees should be watered if drought threatens in late spring and a good mulch should be applied to prevent the soil from drying out.

These suggestions only touch lightly

upon the subject, but they are sufficient to show that many fruit trees can serve two purposes. For books to read detailing cultivation and pruning it is advisable to consult your local library. (M.h.)

● Continued from page 354

## FIRE-FIGHTING SCIENCE

aluminium sulphate). The handy extinguishers often carried in motorcars usually contain carbon tetrachloride, which, however, is a poisonous gas and should not be breathed in large quantities.

Oil, petrol and various greases will all float upon water, so fires involving these materials should never be fought with water, because of the danger of spreading the flames. Some simple experiments will suggest measures to adopt when these highly inflammable substances catch fire. Almost fill a small tin with water and stand it in a large round tin lid (or metal pie dish). Place the tin lid upon an upturned metal tray as shown in Fig. 2. Pour some lighter fuel on to the water

and set it alight. As the yellow flames leap upwards, cover the small tin with a sheet of cardboard. Deprived of air, the flames will be extinguished. Next, add some more lighter fuel and start the fire again. Pour some carbon tetrachloride into a large metal container and warm it over the flames. When much of the carbon tetrachloride is vaporized, pour the gas over the fire. Once again combustion will cease. Finally, light the fire again, but this time pour some water on the flames. The water in the tin will overflow into the surrounding 'moat' and the petrol fire will merely spread downwards and become much worse.

Obviously inflammable materials should always be protected from fire

hazard and the dangers of forest and heath fires during long Summer heat waves must be guarded against, but there are other less apparent causes of conflagration. The activities of bacteria multiplying in the damp centre of a badly thatched hayrick can cause a fire by 'spontaneous combustion'. Water-filled goldfish bowls have been known to cause curtains to catch fire when they behaved like burning glasses and focused the sun's rays on to the drapery. Similarly, the 'burning glass actions' of irresponsibly discarded lemonade bottles have caused serious fire outbreaks in the country. Cigarette ends might be glowing at temperatures near 800°C when they are thrown away — well above the kindling temperature of paper! Fire is indeed a formidable destroyer of life, happiness and personal property. Nobody should be without an awareness of the rudiments of fire-fighting science.

# TAKING PANORAMIC VIEWS

HOW often have you been denied a good photo of a particular scene through not being able to get it all into the viewfinder? This is a common obstacle when tackling wide landscapes or large or tall buildings where space is too confined to get far enough away from the subject.

The answer of course is to use a wide-angle lens, but these are expensive and cannot be fitted to every camera. The alternative method described here involves, briefly, taking a series of pictures to cover the whole scene, each one overlapping the other, and then sticking them together to form a composite picture which is then copied.

Do not choose a day when the sun is hidden by passing clouds every few minutes, otherwise patches of shadow will show on one print which cannot be matched on the next. Set up the camera preferably on a tripod and plan the shots to be taken beforehand, making a few trial swings to make sure all the important parts of the scene will be covered. For a first attempt it is as well to choose a scene that can be divided into two or three parts only.

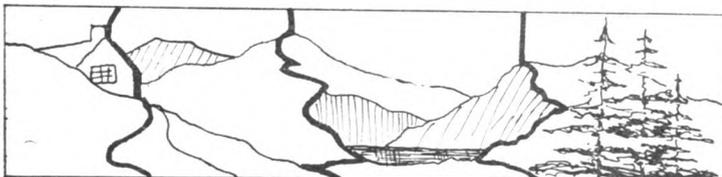
The exposure for the sequences should

be carefully calculated to ensure an even tone in the final composite print, and for each successive shot an overlap of about one-third must be allowed on the previous exposure.

Having decided on the print size, the enlarger focusing must remain unaltered until all the others have been printed, and particular care should be taken not to print one print darker or lighter than the others. Use glossy or smooth matt single weight paper.

paper base can also be glasspapered at the edges, always moving the paper away from the centre of the print and never going backwards and forwards.

When mounting use a soft paste so that the prints can be moved about freely for matching. The cellulose type as used for wallpapering will do. Mount the prints on a sheet of card, matching one to another carefully until the picture is completed. Ensure that the cut edges are all well stuck down.



How the composite picture is made up. Thick lines denote the cut edges of each print

In trimming, one edge of each print is cut along a natural edge, such as a wall, hedge or building, but try to avoid cutting through a continuous tone such as a clear sky. The cutting should be done with a very sharp knife such as a craft tool with the blade held at an angle. The

When the composite print is dry, it can be retouched if necessary and then copied with the camera. If the pasting and cutting have been done carefully the print from the copy negative should show no trace of the way in which the picture was made up. (J.H.P.)

## Easily-made Utility Shelves

NOTHING could be simpler than the construction of these utility shelves. In the drawing room they can be used to display books, knick-knacks, collections; in the kitchen they will carry your saucepans, whilst in the workshop they will serve a host of purposes.

By E. Capper

The four shelves are 3 ft. long, or 7 in. by  $\frac{3}{8}$  in. deal; the back and side triangular supports are of  $\frac{1}{4}$  in. plywood (or  $\frac{3}{8}$  in. thick deal, if you prefer), and the two front legs are of 1 in. diameter dowelling.

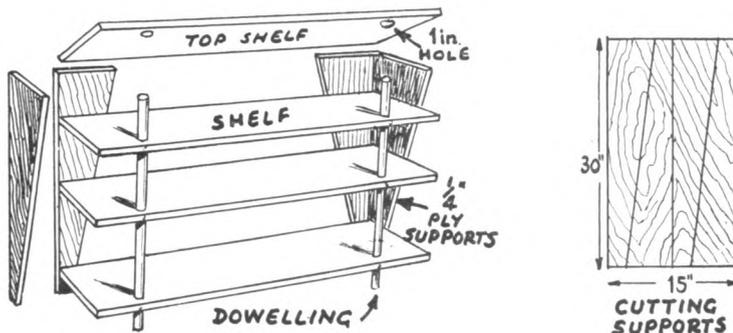
The illustration shows the economical way of cutting all four supports from a sheet of 30 in. by 15 in. plywood. Each support is 5 in. across the top, and  $2\frac{1}{2}$  in. across the bottom. If you prefer using  $\frac{3}{8}$  in. thick deal, one pair can be made

from a length measuring  $7\frac{1}{2}$  in. in width.

The 1 in. dowelling legs are also cut 30 in. long. They pass through 1 in. holes drilled through the shelves, sited 4 in. in from the ends, and with the centres  $1\frac{1}{2}$  in. in from the front edges. The shelves are 'locked' to the dowelling by the driving of a 'lost-head' nail

through from the shelf front. A 'lost-head' nail is a type with a head slightly larger than its shank, and which allows it to be punched below the surface of the wood. Use woodfiller to fill the hole.

The plywood supports are fixed to the shelves with small countersunk head screws.



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...ab evenly on the paper in... to know if you could... wish to make some plan... mitter? (R.P. — Wolverhampton.)  
 ...ght and hang to dry under... to go over the wallpaper... on the same... Channel 10 would

# Replies to Readers

...rectly... is a brush polish... to charge a 12V. battery, as c... was made by fixing... V. and 15V... (more.)... board over a sto

## Reclaiming Zinc from Batteries

IS it possible to remove the manganese dioxide from the black mixture in batteries, and is it possible to clean the grime and chemicals from the zinc casing in order to use the zinc? I have quite a few old batteries and wish to use them before they decay. (A.G. — Blackpool.)

THE manganese dioxide cannot be removed as such from dry batteries. It would be necessary to warm the mixture with dilute sulphuric acid so as to dissolve out the dioxide as manganese sulphate, to filter from insoluble matter

All queries must be addressed to The Editor, 'Hobbies Weekly', Dereham, Norfolk. Enclose stamp for reply and Readers' Reply Coupon.

and then to mix the filtrate with potassium permanganate solution, when hydrated manganese dioxide is precipitated. The zinc may be recovered easily, however, though not in its existing form. Remove the casing and free it as far as possible from adhering mixture. Melt down the metal, skim off dross and pour out on to a stone slab. The metal will now be clean and silvery white. If rods are required, press a pencil flat on firmed packed earth so as to form a trough, remove the pencil and cast the molten metal in the trough.

\* \* \*

## 'Sticky' Rexine

I HAVE a three-piece suite covered in rexine, but lately it has become sticky; so much so, that covers and cushions stick to it. Can you give me any reason for this, and is there anything I can do to remedy it, or must the suite be re-covered? (W.H.T. — Stourbridge.)

THERE are a great many plastics used for upholstery and true Rexine or the majority of materials should never get sticky. They are more likely to become brittle and hard as they age. Has a cleaner or polish been used on your material? If so, it may be that which has become sticky. This could be removed with petrol or turps. substitute. 'Polyclens' would also do it. We suggest you try these fluids on an inconspicuous part. If this works, clean off the whole surface and polish with a cleaner sold by garages and such car sundries firms as Halfords for synthetic leather car upholstery.

## Wintering Cacti

I HAVE a cold frame and the top is covered with thin celluloid. I want to use the frame this winter for storing cacti and succulent plants. If I put a small paraffin lamp inside the frame, would the heat affect the plants; would the heat affect the celluloid and how could I maintain an even temperature with the lamp? (B.M. — Sutton Coldfield.)

A LAMP is quite unsuitable for a small frame. We believe such a small frame would probably be unsuitable for storing cacti anyway, but if you do intend using it, we think the only satisfactory solution is to employ a soil warming cable and to make sure the frame is quite draught-free. A good soil warming cable should under these conditions keep the frame temperature above 32 degrees Fahrenheit which is really all that is necessary for cacti. They will usually winter quite well providing the temperature does not drop below freezing point. The frame should, of course, be covered with sacking, etc, during severe spells.

\* \* \*

## VHF Car Radio

FROM my 12 volt car radio I wish to add an attachment which will bring in VHF 80-100 m/cs. How could this be done, and what parts would be required? (C.B. — Whitwick.)

IT is doubtful if satisfactory VHF reception would be obtained in a vehicle. The screening effect of buildings, and changes in direction would be likely to cause considerable variation in signal strength. There is no simple way of adapting an ordinary car radio for VHF. In those circumstances where VHF would be satisfactory, a combined VHF/broadcast type receiver could be used. A converter or similar device cannot be used because a different system of detection is necessary. Osmor Radio, 418 Brighton Road, South Croydon, can supply parts, etc, for a VHF/broadcast transistor set.

Next week's free design will be for making a delightful dog picture in wood to be used as a clothes brush panel. Make sure of your copy.

## Range of a Multimeter

I WISH to build a multimeter for testing ordinary domestic valve and transistor radio sets (pre-war and post-war). Could you please tell me:

- (A) the highest and lowest currents, A.C. and D.C. that I am likely to encounter.  
 (B) the highest and lowest voltages I am likely to encounter, A.C. and D.C.  
 (C) the highest and lowest resistances I may have to test.  
 (D) Can I use the same meter to test both A.C. and D.C. currents and voltages, or must I alter the circuit — if so, how can I do this? (B.M. — Sutton Coldfield.)

IN mains sets, readings of up to 500V D.C. and A.C. should usually suffice. In these sets, direct current will seldom exceed 100mA, but 250mA may be occasionally useful. Alternating currents are seldom measured, in view of the special equipment needed, and circuits may usually be checked by measuring A.C. voltages instead. In transistor sets, over 9V. is unusual, and currents seldom exceed 25mA. Resistances in these sets usually lie between about 2 and 50,000 ohms. In valve sets, resistances up to 2 megohms, or higher, are encountered. A 1mA or 5mA meter would normally be preferred, as the current drawn by it is less, in voltage tests, so that the voltage of circuits having much resistance can be more exactly seen. A D.C. meter will not read A.C., and an instrument rectifier has to be added for this.

## DECORATIVE OVERLAYS

THE decorative overlays shown on page 359 are suitable for cutting out with a fretsaw, either with handframe or machine. The materials used will of course depend upon the object to be decorated, but usually they

## PATTERNS OPPOSITE

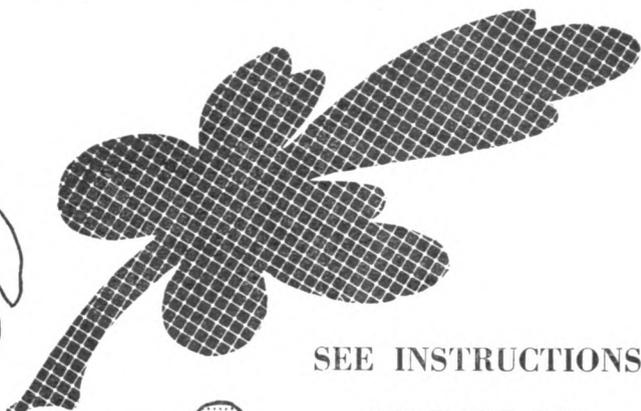
will be cut from thin wood. Brass, copper, aluminium and plastics can also be used but care must be taken or the surfaces will be scratched. You will, of course, use a Hobbies metal cutting sawblade where applicable.

Interior frets are drilled and cut out first, then the outline is completed. If cutting metal, the blade must be lubricated frequently or it will run hot and break. Fixing may be with glue or brass pins.

The overlays may be used to advantage on such things as small boxes for trinkets or cigarettes, small cabinets, book ends and other novelties. (M.p.)

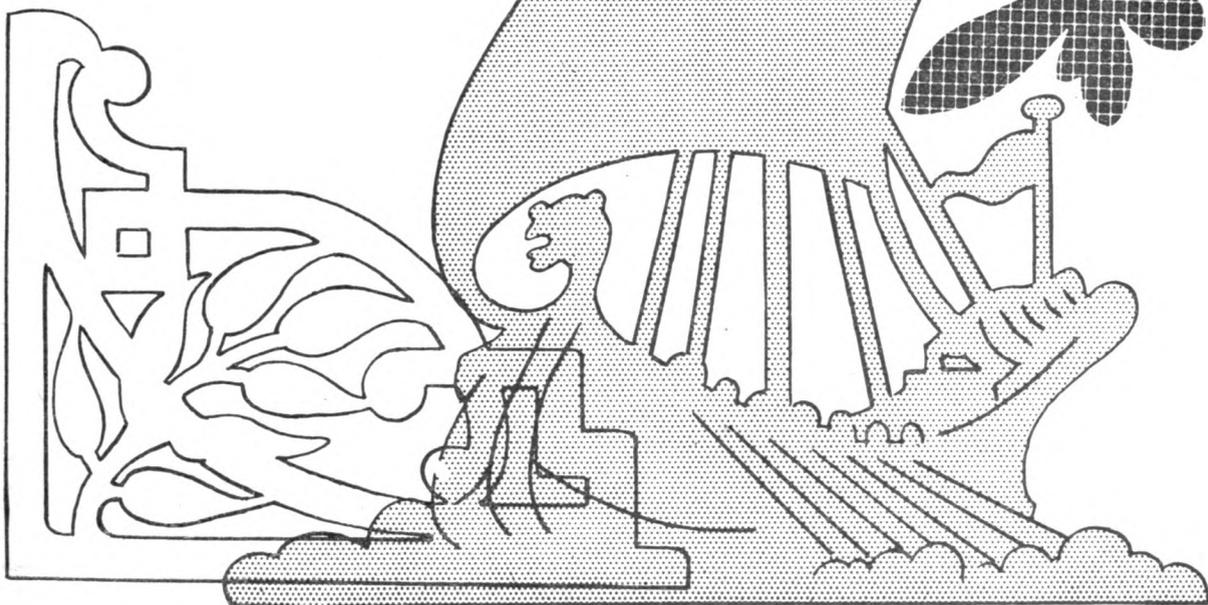
Use these on your projects

# DECORATIVE OVERLAYS

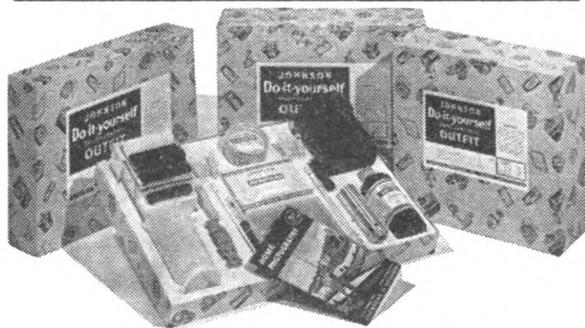


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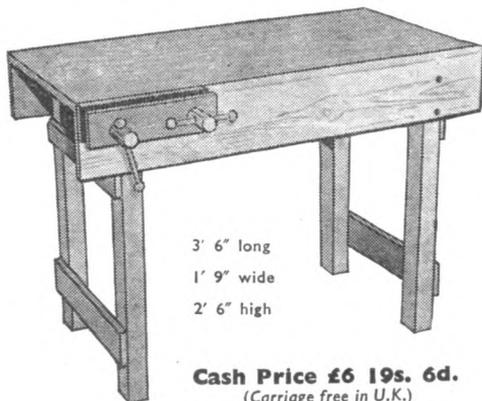
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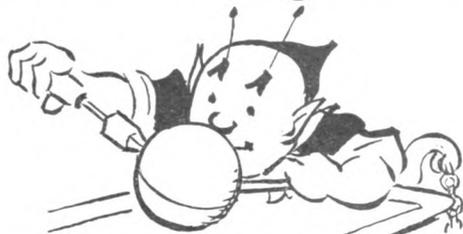
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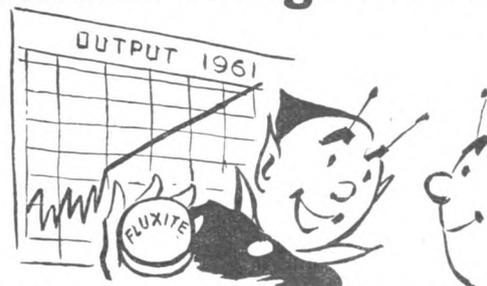
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