HOBBIES WEEKLY

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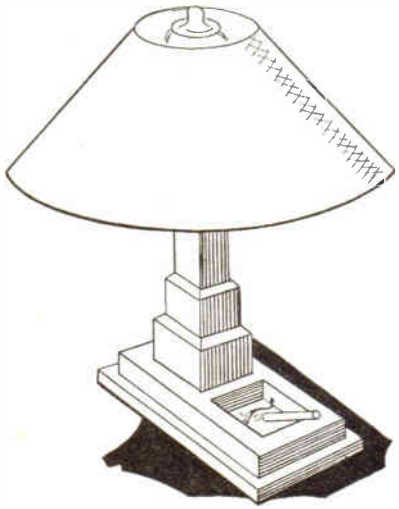
IN THIS ISSUE



For readers in bed who appreciate that last minute 'puff'

Construction made easy

COMBINED LAMP AND ASHTRAY

WE do not advocate smoking in bed — but on the other hand we do not deny that many people do so. We have, therefore, prepared this combined lamp and ashtray expressly for this purpose. Nothing could be more convenient than to have the light and ashtray together. You can then make sure before going to sleep that your cigarette is extinguished, and has not fallen to the floor.

The lamp can, of course, be made up without the tray by simply omitting it from the base and making the base smaller.

The construction is shown quite clearly in the diagrams, and you should start off by making the centre column, This consists of four pieces of ⅜in. wood. each piece measuring 4½ins. by ⅜in. These should be glued together as shown in Fig. 1. Note the groove in the bottom, to allow the flex to lead out from the bulb holder.

Next prepare the pieces around the base as shown in Fig. 2. These pieces measure 2ins. tall by 1½ins. wide, and are mitred together at the corners and chamfered at the top. It is not imperative to mitre, the pieces can be butted together if desired, but, of course, in this case the sizes will be different. Once again note the groove at the base.

The next step is to put the final pieces round the base as shown in Fig. 3. Once again four pieces, this time measuring 2ins. by 1in. These also are mitred and glued round the base, not forgetting, of course, the groove. On top of the column, glue a 1in. square by ¼in. thick piece of wood, with a hole in the centre to take the flex.

STEP-BY-STEP ASSEMBLY

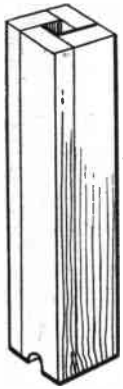


Fig. 1

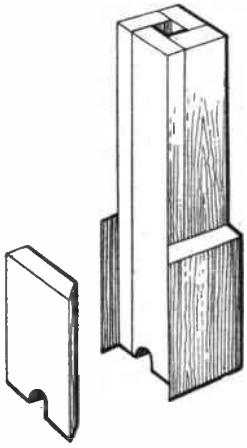


Fig. 2

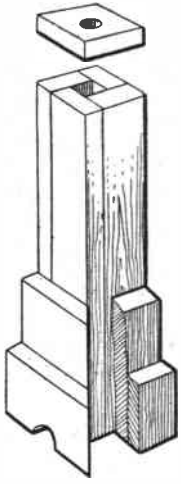


Fig. 3

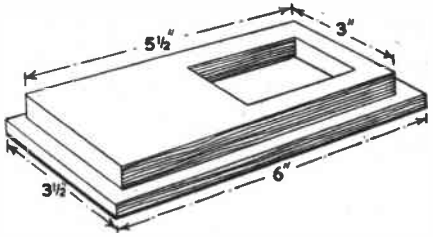


Fig. 4

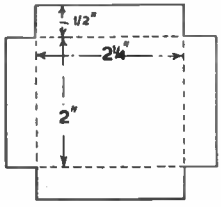


Fig. 5

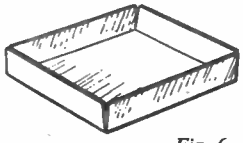


Fig. 6

The base is made up from two pieces of wood, the lower piece ¼in. thick and the main piece ½in. thick. The ½in. piece has a rectangle measuring 2¼ins. by 2ins., cut out to receive the ashtray. They are glued together as in Fig. 4.

The column complete can now be fixed to the base after threading the flex through. Do not forget the flex because it will be difficult to thread once the column is in place.

The ashtray is made up from a piece of aluminium, copper or pewter, to the dimensions shown in Fig. 5. It is not soldered in any way, but is simply bent and formed into the shape of a tray, as shown in Fig. 6. It is then dropped into the hole already cut in the base.

We have not shown details of the lampshade and holder because this is more or less common knowledge. Hobbies Ltd. of Dereham, Norfolk, can supply a suitable bulb holder which has a nipple intended to be screwed on the top of the column. We can also supply a book on shade making, price 2/9 post free.

To finish the lamp, you can stain and polish or varnish, or paint with plastic enamel paint. For a bedroom we prefer the latter because you can then use a pale shade, which is more pleasing for the purpose. Give two or three coats, allowing each coat to dry thoroughly, and glasspapering before applying the next. Three coats should be sufficient for a high gloss finish. (M.h.)

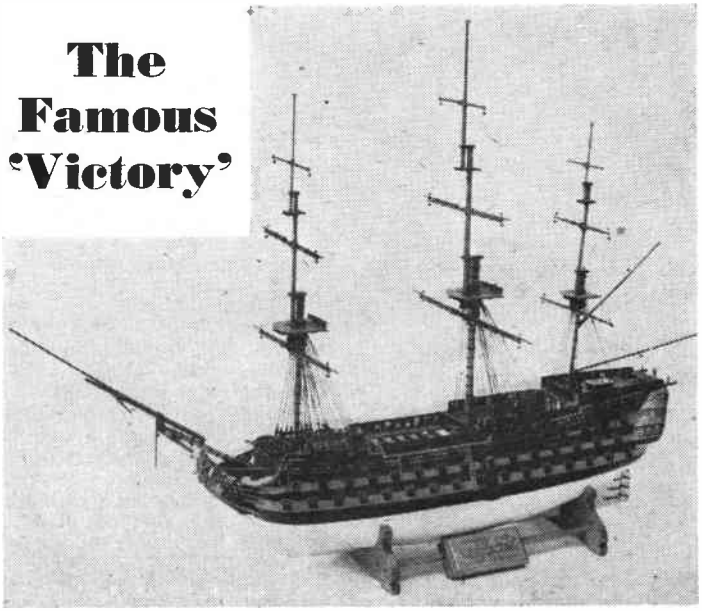
☆ ☆ ☆TIMELY TIPS☆ ☆ ☆

Plasticine Aids

PLASTICINE pressed to the top edge of a jar or other wide-mouthed container will facilitate the transference of liquids or powder to a smaller vessel. Shape the material to form a spout. To further ensure that nothing is spilled, putty, etc., can be used to form a temporary funnel.

A 'dam' formed around the drill point can save a lot of applications of the oilcan when drilling metal. The 'dam', formed of Plasticine, is made high enough to prevent the oil from being thrown about by the rotating drill.

The Famous 'Victory'



H.M.S. 'Victory', which won for F. Allen, of Wythenshawe, Manchester, the Hobbies Cup for the best model made from a Hobbies Kit, at the Eighth Northern Models Exhibition, Manchester.

Handy in the Workshop

Metal Tube Bending Device

THE model engineer and plumbing handyman often need metal tube bent at various angles, but find it difficult to obtain a nice even curve.

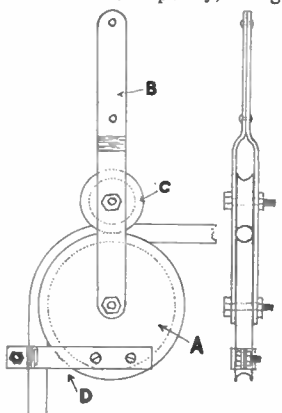
To overcome this difficulty an efficient little tool has been devised.

The drawing shows the gadget in operation and besides producing a right angle bend with a neat curve, it is capable of anything from the straight to a 'U' bend. No definite measurements can be given, as this will depend entirely upon the size of the tubing and the acuteness of the bend.

Small and medium size brass and copper tubing will bend easily provided the walls are not too thick, but it is necessary to anneal it before bending. This needs doing carefully, so as not to unduly weaken the metal which may happen if made too hot. Brass and copper are annealed by bringing to a dull red heat and either allowing the metal to cool in the air, or plunging into cold water.

Unless the tube is quite small, best results are obtained by 'loading' it before attempting to bend it. This is done by putting a plug of wood or cork into one end, filling the tube with fine dry sand, and putting another plug in to keep the sand tight. Greater tightness is obtained by lightly tapping the sides of the tube as you proceed. The sand can be poured out easily when the job is done, provided it is quite dry and fine.

The former (A) round which the tube is bent is a wooden pulley, the groove



fitting the tube as nearly as possible. For medium and small bends this is best turned up on the lathe, but if this is not convenient, quite a good former can be cut out with a fretsaw and the groove made with a gouge and half round file, smoothing off with glasspaper.

Drill a hole in the centre to take a substantial bolt, and it is on this that the bending lever (B) revolves around the former. It is necessary to make this lever of strong material such as a strip of iron, brass or aluminium. The length of the lever will depend on the thickness and type of tubing being bent, and the larger it is within reason, the easier will the bending be.

The lever may be in one piece and bent at the top, or two pieces riveted together and shaped to give ample clearance for the roller and former.

The roller (C) which does the actual bending is much smaller than the former and should be made of hard metal, the groove fitting the tubing as near as possible. This is also bolted to the lever, so that it can be slipped out easily to remove the tube when finished.

To complete the tool we need a clip to hold the tube secure while the bending is being carried out. Strong gauge strip metal will do for this, but it must be securely fixed to the former and have bolts that will enable the strip to be tightened up to grip the tubing.

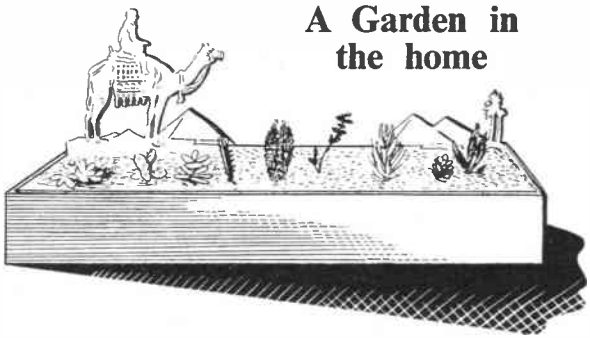
When pulling the lever over, it is best to do this with a slow steady action, which will produce a smoother curve than if you do it in jerks. It is also an advantage to grip the former in a vice, so that extra pressure can be applied. (A.F.T.)

Display Stand for Cacti

THE novelty appeal of this attractive stand lies in the background scene of camel and pyramids. It blends admirably with the cacti which are grouped in the box to give a scenic effect.

The essential part is, of course, the box which is shown in Fig. 1. Make it up to your own measurements according to the number of cacti you wish to plant. Nail the front and back to the sides and then the base direct on to these, punching the nails well home. Fill the nail holes with putty and give an undercoat of paint. Two coats of high gloss enamel will finish off the container.

Patterns are on page 143



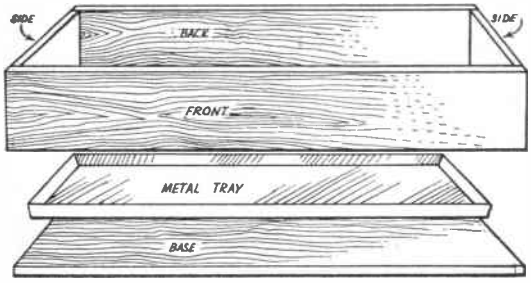


Fig. 1

Make or order a galvanized tray to fit the box as shown in Fig. 1. This will hold any water that drains through.

The cut-outs, shown on the pattern page are now screwed behind the back, about ½in. down will be enough. You can leave ½in. extra on the bases of the cut-outs if you wish.

The cut-outs should be painted in a colour to harmonise with the display stand. A good effect is obtained by painting the stand white and the cut-outs fawn. These pale colours seem to enhance the beauty of the succulents and cacti. **(M.p.)**

Methods of Cooling

SIMPLE REFRIGERATION

By E. S. Brown

THE principle of elementary refrigeration by the evaporation of water has been known for many centuries in hot countries where the water gourd is an excellent example. These water containers are of a semi-porous material which absorbs some of the water contained therein. The large surface of the vessel together with the normal hot climatic conditions induces a considerable evaporation, resulting in a reduced surface temperature, which in turn considerably cools the contents.

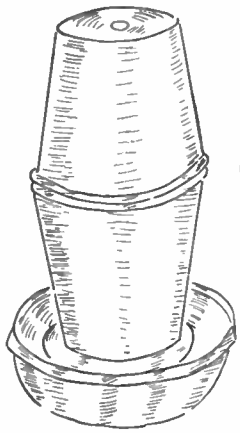


Fig. 1

A similar parallel is to be found in the porous earthenware milk and butter coolers which have been quite common in this country for many years.

A useful method of keeping perishable foodstuffs cool during hot weather is by means of two large flower pots, one inverted upon the other and stood in a receptacle such as a plate which is nearly filled with water (Fig. 1). An absorbent cloth is then placed over the flower pots and the ends allowed to lie in the water. The capillary action of the water will soon saturate both the cloth and flower pots, and any foodstuffs placed inside will be most effectively cooled. It is best to initially well soak the flower pots in water, otherwise some little time may elapse before the cooling process gets completely under way. Also, the water must be periodically replenished.

Within certain limits, the greater the rate of evaporation, the lower is the surface temperature. A moving air-stream has far greater powers of evaporation than one that is stagnant, therefore, with coolers employing the evaporative principle, every endeavour should be made to place them in a moving current of air. An ideal position is by the open window, or in the hearth where there is always a certain amount of air-movement, or again, close to an electric fan.

The addition of any quickly soluble solid into water reduces the temperature of same, but, perhaps, the most efficient is hyposulphite of sodium (Hypo), which, when added to water has strong cooling properties.

Where a method of quickly cooling drinks, jellies, etc., is desired, ½lb. of hypo dissolved in 2 pints of cold water will be found very effective. The cooling effect is, however, only temporary, and great care must be taken to avoid actual contact between the beverages and sweets, etc., and the coolant. This is easily arranged when serving drinks by keeping them in their bottles and immersing same in the cooling liquid. With jellies, the moulds or containers should be immersed only half-way, and a sheet of cellulose secured around the top with an elastic band.

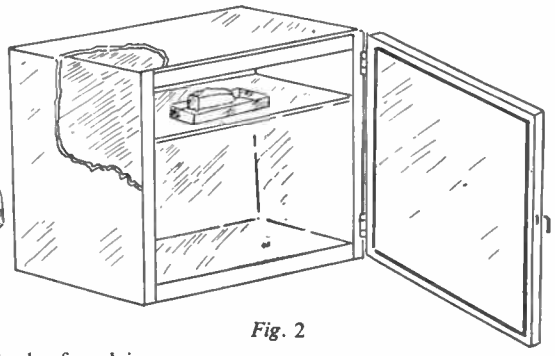


Fig. 2

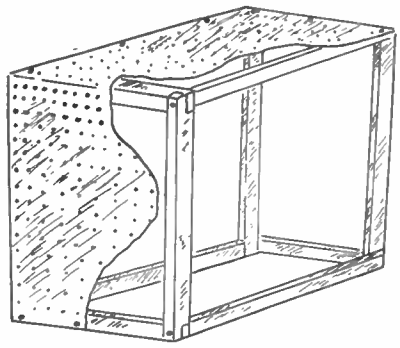


Fig. 3

Another very effective cooling solution can be made by mixing equal proportions of alcohol or methylated spirits with water. The solution should be placed in a wide receptacle, and the milk containers, etc., placed within. Unlike the previous cooling solutions, the one described above will effectively continue to cool until its alcohol content becomes negligible. Slight additions of alcohol can be periodically made to extend the life of the solution as desired.

It is absolutely essential that all foodstuffs, etc., that are cooled by this method are hermetically or air-tight sealed, especially when methylated spirit is used, otherwise the contents will become contaminated and unfit for consumption.

Camping tip

When camping, a useful tip to keep provisions cool and fresh is to dig a small hole some 2ft. deep in the earth, line it with paper or cardboard, then after placing the provisions inside, close the top with crumpled newspapers or hay. The foodstuffs placed inside this elementary refrigerator will keep cool and fresh on the hottest day.

An ice or cold box is the very thing for preserving food, etc., during very hot weather. The construction is not very difficult, consisting of a 'double-skin' box, which is in effect two boxes in one (Fig. 2). In the space between the two boxes is placed an insulating material such as glass or fibre wool. This is very necessary in order to conserve the low temperature within the box for as long as possible. In a properly insulated ice-box, the block of ice placed therein lasts many days, and gives efficient results for a nominal outlay.

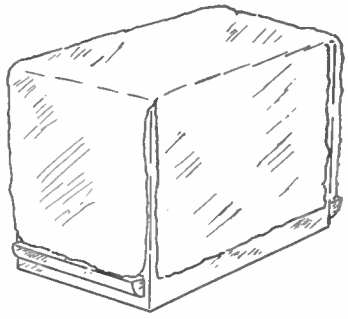


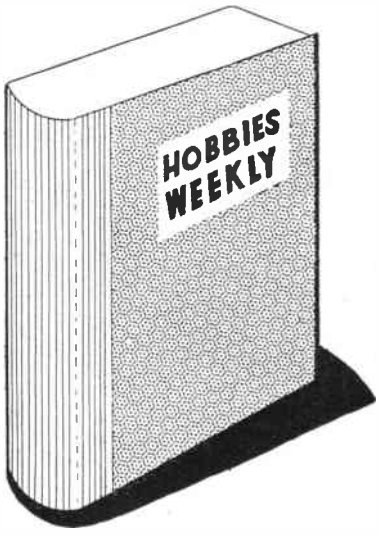
Fig. 4

The door should also be constructed on the double-skin principle with an

● **Continued on page 133**

For convenient storage

MAKE A BOX FILE



By S. H. Longbottom

A BOX file is a most convenient way of storing papers or periodicals and the one to be described has been specially designed for holding *Hobbies Weeklies*. A similar file may be made for other purposes, but it will be noticed that this one takes the form of a book.

You require an empty cardboard carton of reasonable thickness, measuring at least 20ins. by 12ins. One side is cut away and marked out as Fig. 1. Cut out on the unbroken lines, and score on the dotted lines to assist in folding. Note the section marked (B) represents the spine, and this will be slightly curved in the finished file. Although not shown in the sketch, it is helpful to score a line down the centre, with further scores on either side, folding over gently on a brush handle to form the rounded shape. All scoring is done on the inside of the card.

Attractive covering

At this point the outside should be given a paper cover glued to the card, using any attractive covering you may have. Allow this covering to overlap at the edges, folding over on to the inside. The spine should have a separate piece glued on of a contrasting colour. When this has been done, fold over the flaps (F), bend over the sides, and together. This forms the tray part of the file to hold the books or papers, and you may fasten the spine to the rounded end by a touch of strong glue on the edges, assisted by a strip of gummed strip on the inside. Alternatively, this part may be left free to allow easy access.

The inside of the file may then be covered with a lining paper and this must fit almost to the edges, covering the outside covering which has been folded over. For files subject to heavy use add a small piece of stronger material across each corner as is done with old books. The name of the particular periodical may be printed on the front and on the spine, or you may cut out the name from the title page and stick this on.

Fig. 2 shows how the centre is obtained for preparing the rounded edge for this book-form file. It should also be noted from Fig. 1 that the lid is just slightly larger than the box itself, otherwise it would fall into the box. When marking out allow for the thickness of the material being used, usually about $\frac{1}{8}$in., making the lid $\frac{1}{4}$in. deeper than the base of the box.

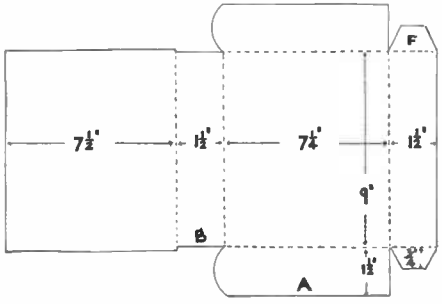


Fig. 1

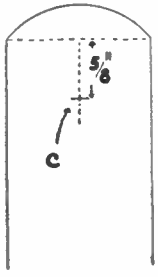


Fig. 2

● **Continued from page 132**

SIMPLE REFRIGERATION

inter-lining of glass wool, and a soft and easily compressible rubber beading placed around the inside of the door on its outer edge to ensure an air-tight fit when closed. The rubber beading may be fixed with a strong adhesive such as Bostik 252 reinforced with a few tacks if necessary. The catch may be of the simple type as fitted to larder doors, etc., which when closed, exert a slight pressure upon the door.

A shelf is fitted towards the top of the box upon which the ice is placed; all food and perishables are placed beneath the ice as low as possible in the box. This is really very necessary, as the cold air coming from the ice is of heavier density than the surrounding air, and sinks to the lower portions of the box. The ice should, of course, be placed in a receptacle large enough to retain the water when the ice has completely melted, without overflowing.

A more ambitious adaptation of the water gourd and flower-pots can be made by constructing a simple evaporative type refrigerator as shown in Figs. 3 and 4. A simple framework is constructed of wood, the various joints being made with brass or copper screws. The assembly is then covered with perforated zinc. The door is similarly constructed and covered. The whole assembly is then covered with a fairly thick absorbent cloth, the front being arranged in a flap to permit easy access to the door.

Three troughs are made which are fitted to the bottom of three sides of the refrigerator, excluding the door. These are filled with water and the ends of the absorbent material placed within them, when the material will become damp with capillary action. As with the flower-pot type of cooler, the process can be hastened by damping the material beforehand. As the action of this particular type of refrigerator depends upon the continual and fairly rapid evaporation of the water, replacement should be made in the troughs when necessary. None of the cooling solutions men tioned earlier in this article should be used as contamination is certain to occur. With water, however, there is no danger.

Home Chemistry

Experiments with Aluminium

THE metal aluminium needs no introduction, for we see it all around us in ever increasing use — as pens, boxes, 'silver' paper, screw tops and the alloys used on racing cycles and cars, and for lightweight equipment generally.

You probably have a discarded aluminium saucepan. You can use it to carry out some interesting experiments and to prepare a series of aluminium compounds for your laboratory stock. Clean it up if necessary with emery paper and cut it into pieces small enough to go into a stock bottle.

Like other metals, aluminium forms salts with acids. Place a piece in dilute hydrochloric acid in a test tube. Hydrogen will be given off, the metal dissolves and the salt aluminium chloride is formed. Now repeat the experiment using a solution of sodium hydroxide (caustic soda). Again hydrogen is given off and the aluminium dissolves. Most other metals are unaffected by sodium hydroxide, which is the direct opposite of an acid, that is, a base. Why should aluminium behave in this contradictory way?

The reason is that whereas aluminium behaves like a metal in most of its reactions, it can also behave like an acid in certain circumstances, combining with a base to form an aluminate. In the sodium hydroxide solution it formed sodium aluminate. Metals which can combine with bases as well as with acids are said to be amphoteric.

Industrial uses

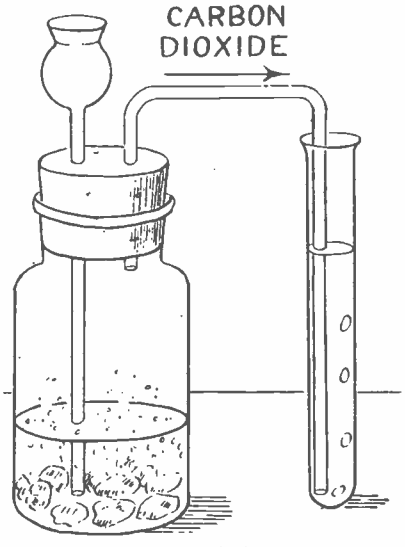
Sodium aluminate is prepared industrially in large quantities from aluminium bearing minerals as a step towards the manufacture of aluminium sulphate and alum, both important industrial chemicals. There are various ways of using the sodium aluminate, but the easiest as a laboratory demonstration is to pass carbon dioxide through its solution. The sodium hydroxide in your test tube should be saturated with aluminium until an undissolved residue of the metal is left. Pour the clear upper solution into another test tube. Generate carbon dioxide from marble chips and dilute hydrochloric acid in the apparatus shown in the diagram and pass it through the sodium aluminate solution contained in the test tube.

A white precipitate soon appears. This is aluminium hydroxide. Carbon dioxide has combined with the sodium and thrown out the aluminium in this form. When the gas has passed through for about fifteen minutes, filter off the aluminium hydroxide, wash it on the filter with water and place a little on a watch glass.

On adding a drop or two of dilute sulphuric acid the hydroxide dissolves, forming a solution of aluminium sulphate. Industrially, this is evaporated and the solid white salt is obtained, to be either used as such or converted into alum by dissolving it with the correct amount of potassium sulphate in water and crystallising.

Preparing stock

Now to prepare a few aluminium compounds for your stock. We must have the aluminium in solution as a salt, and the best way to start from the metal is to dissolve it in hydrochloric acid. Instead of making up a large stock solution it is suggested that you make the small quantity given below as the starting point for each compound. In this way you can prepare all or just one or two of them as desired.



Stir 20 c.c. of strong hydrochloric acid into 40 c.c. of water and pour it on to some aluminium clippings. As we saw in the small scale test tube experiment, hydrogen is given off. This gas is inflammable, so extinguish all naked flames or place the reaction vessel in the open air. If all the aluminium dissolves, add further quantities until effervescence stops and undissolved metal remains. Decant the clear solution of aluminium chloride so formed into a bottle for your stock. Do not attempt to evaporate the solution in order to obtain the solid salt, for decomposition occurs.

To prepare aluminium sulphate we must first make aluminium hydroxide. To another quantity of aluminium chloride solution add ammonia until a drop of the liquid when spotted on red litmus paper turns it blue. A gelatinous white precipitate of aluminium hydroxide forms. Filter this off on a cotton filter, wash it with hot water until one wash water gives no white precipitate with silver nitrate solution.

Put the aluminium hydroxide into a beaker, keeping back a little in the filter. Now add dilute sulphuric acid a few drops at a time and warming the beaker over wire gauze. The aluminium hydroxide gradually dissolves to form a solution of aluminium sulphate. Take care not to add too much sulphuric acid. A slight residue of aluminium hydroxide should remain undissolved. Should you overshoot the mark, add the rest of the aluminium hydroxide from the filter.

Now filter the solution and evaporate to dryness, when you will obtain aluminium sulphate as a white solid.

To prepare a specimen of alum, dissolve 6·66 grams of aluminium sulphate and 1·74 grams of potassium sulphate in 50 c.c. of hot water and boil down the solution to the crystallisation point. The crystallisation point is determined by taking up a drop of the solution on a glass rod, when the drop will crystallise almost immediately. Set the solution aside to cool down overnight. Crystals of alum separate. Filter these off and let them dry.

Our crockery contains it

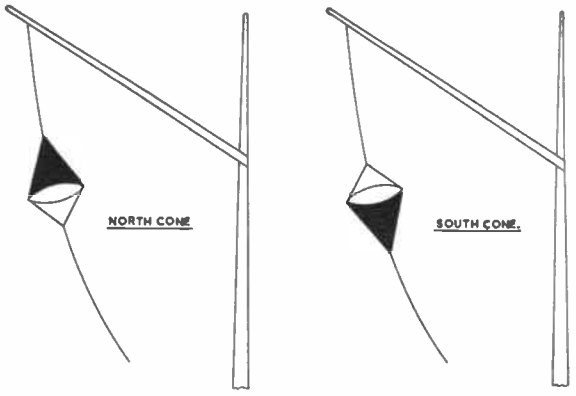
At one point of our daily lives the presence of aluminium may be unsuspected. Our crockery contains a large proportion of this metal, not as free metal, but as an aluminium compound. The clays from which pottery is made consist essentially of aluminium silicate. It is only when we consider just how much clay we meet with in garden and field that we realise the colossal amount of aluminium there must be in the earth's crust.

Clays contain impurities and if you wish to prepare a pure specimen of aluminium silicate, add a solution of water glass — which is sodium silicate — to a solution of aluminium chloride until no more white precipitate forms. The precipitate is aluminium silicate. Pour the liquid on to a filter and wash it with hot water until one wash water gives no white precipitate with silver nitrate solution. Then dry the compound in the oven.

When you admire a turquoise ring

● **Continued on page 135**

Mysterious Cones on the Coast



By C. L. Marriner

'Severe gales are imminent in the sea areas . . . . . cones are being hoisted round coasts north of a line from . . . . . .'

IT is astonishing how few people, particularly among those living away from the sea, have any idea as to the precise nature of the cones frequently mentioned in gale warnings issued over the radio.

Referred to by seafarers as 'distant signals', these cones are exactly what they purport to be — large, hollow cones of black-painted canvas, each stoutly stitched round a strong wooden hoop. They are so called because their shape and colour constitutes what is probably the most clearly distinguishable static signal from the greatest distance at sea.

There are two separate and distinct types of cone in general use at the present time: north cones and south cones. North cones — hoisted point up — signify gales from all points of the compass north of east and west. They are flown also to give warning of storms from due east which are expected to 'back' — that is, to swing back northwards in an anti-clockwise direction.

Similarly, south cones are used to indicate bad weather from all points of the compass south of east and west; also whenever a 'blow' from due east is expected to veer southwards in a clockwise direction.

Incidentally, the latter are easily distinguishable from north cones by virtue of the fact that they are flown the opposite way round: south cones point down.

Gale warnings — which originate with the Meteorological Office — are flashed to those responsible for the Trinity House services, the Coast Guard Headquarters, harbour masters and the Post Office Coast Radio Stations for dissemination. North or south cones are then flown conspicuously at coast guard stations, pier heads and aboard the lightships dotted along the stretch of coast likely to be affected.

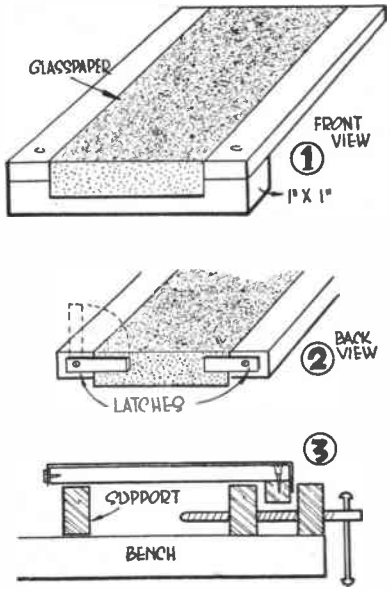
Portable Sanding Table

DESIGNED to fit into a vice, this sanding table is just the thing if your workshop is small and bench space limited. A solid attachment, it can be fixed up in no time for your sanding operations.

Its construction requires little explanation after studying Figs. 1 and 2. The table itself is a perfectly flat piece of hardwood some ½in. thick, cut 2ins. wider and 2ins. shorter in length than the glasspaper you normally use.

While one end of the glasspaper will be held in the vice the other end is maintained by means of the two latches (¼in. plywood — ½in. by 2ins.) screwed into the back end of the table, positioned so that when thrust upwards they become completely clear of the paper.

With the table fixed in the vice, finish the job. Make a wooden support or wedge which is pushed tightly between bench and table (Fig. 3). When fitting the glasspaper, draw tightly over the board before making the folds.



● Continued from page 134

Experiments with Aluminium

you are again looking at an aluminium compound. Turquoise consists of aluminium phosphate coloured by a small quantity of combined copper. The greener varieties of the gem contain iron, too.

Aluminium phosphate is white when pure, as you can readily see for yourself. To a solution of aluminium chloride add sodium phosphate solution until no more white precipitate of aluminium phosphate appears. Filter this off and wash with hot water until one wash water gives no white precipitate with silver nitrate solution. Then dry it in the oven.

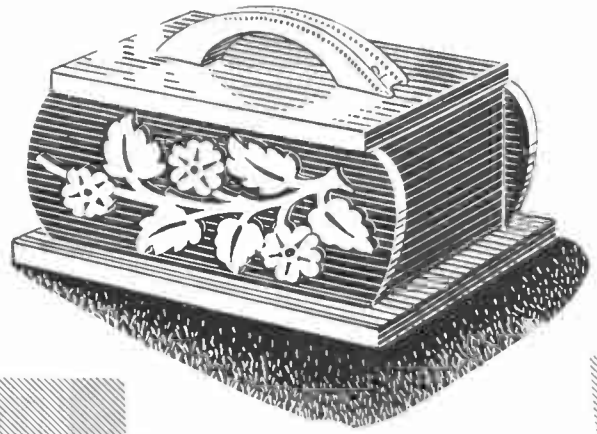
By adding enough copper sulphate solution to the aluminium chloride solution to give a blue shade before precipitating with sodium phosphate solution, you will obtain a bluish precipitate approximating in composition to real turquoise. This may be washed and dried as before.

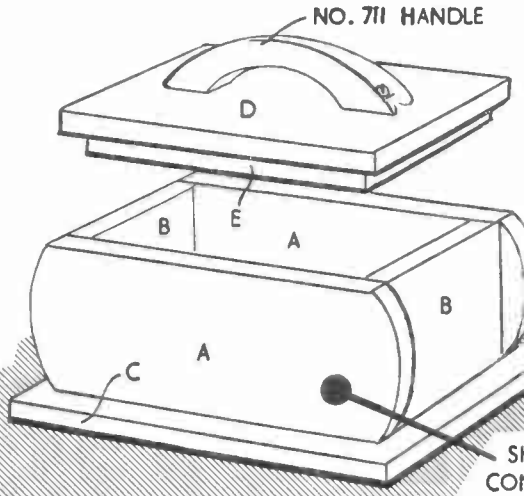
If you have some aluminium powder, you might like to try out a 'fire-without-a-match' trick. Mix equal volumes of powdered iodine and aluminium powder — about as much of each as will heap up on a shilling. Form a cone with the mixture on a piece of slate in the open air, make a small hollow in the tip of the cone and let one drop of water fall in. Violet vapours appear and the mass sets on fire throwing up a cloud of smoke. (L.A.F.)

Hobbies FRETWORK PATTERN

7

PAN
PANELS





SI
COR

LID D. CUT ONE 1/4 IN.

NOTE. THE ARROWS INDICATE
DIRECTION OF GRAIN OF WOOD

3"

US
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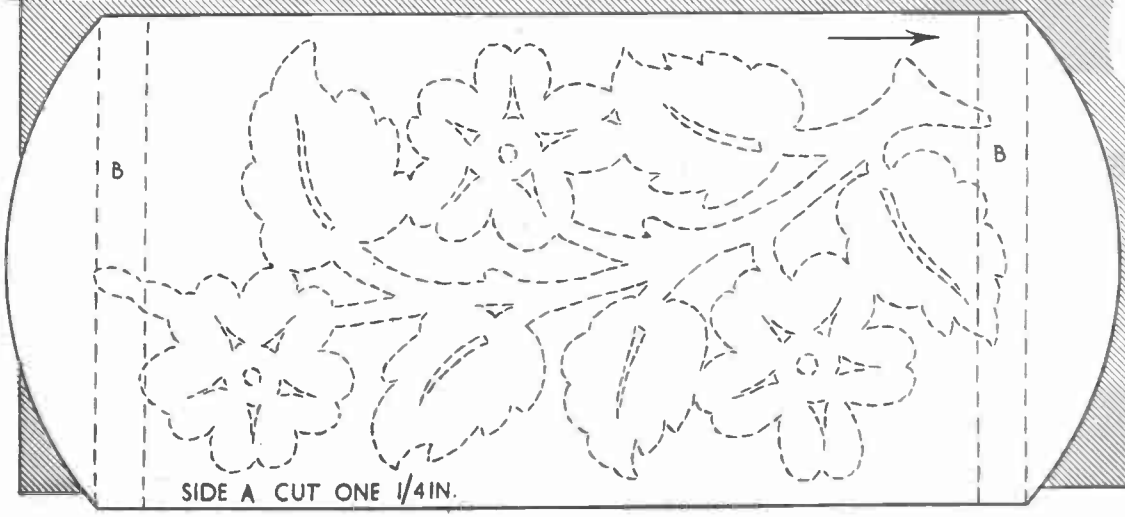

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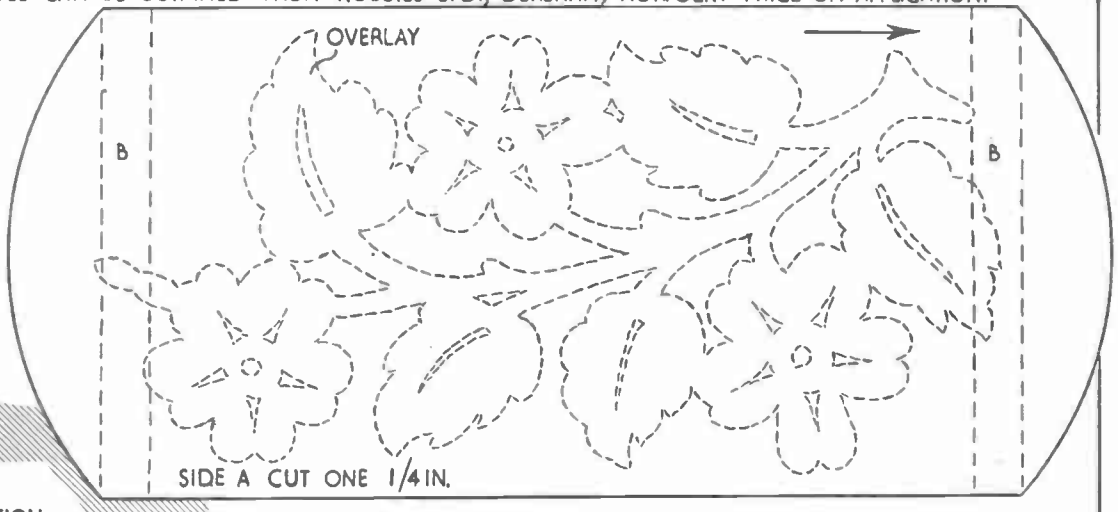
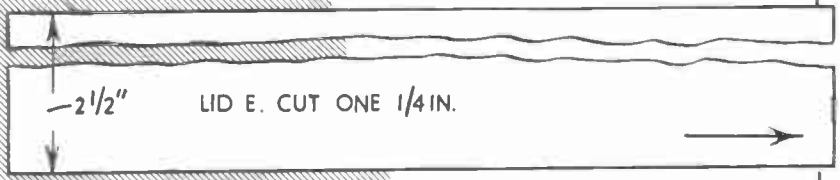
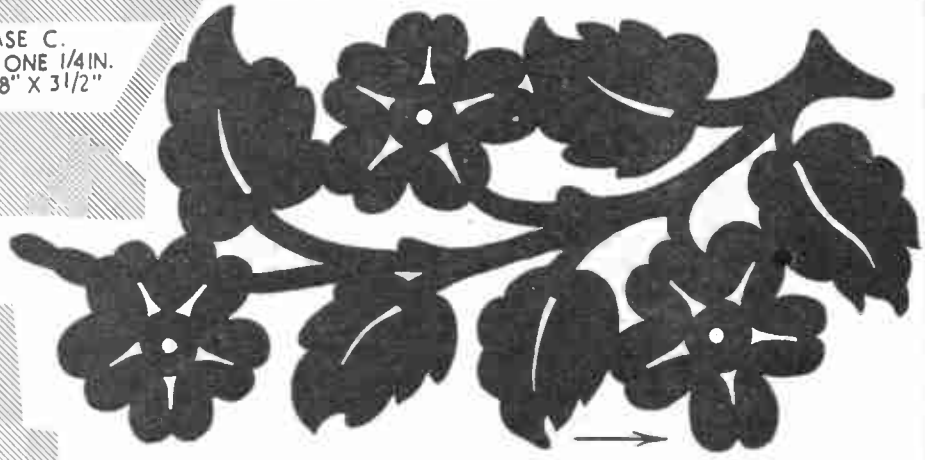




BASE C.
CUT ONE 1/4 IN.
5 3/8" X 3 1/2"



OVERLAYS, CUT TWO 1/8 IN.

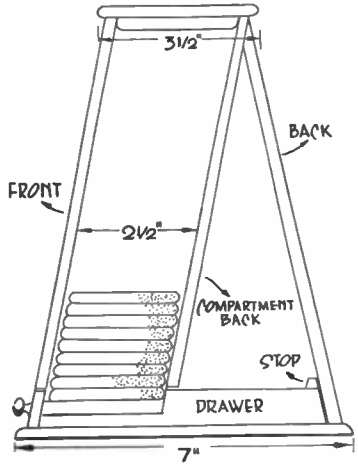
Sweet or Plain?

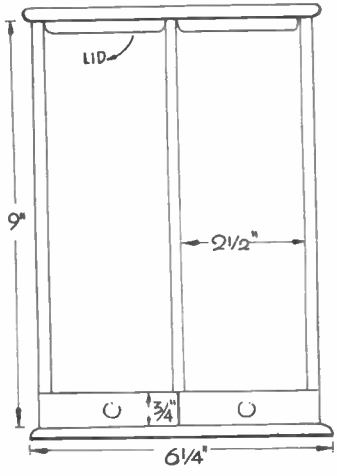
NOVEL BISCUIT SERVER

THIS very useful biscuit server works similar to a slot machine, and delivers a biscuit when one of the drawers at the bottom is pulled out. Having two separate compartments, one can be used for plain biscuits while the other may hold the sweet ones.

It has been designed to hold the average size square biscuits about 2½ins. across or round ones of the same diameter. If the server is required to house other sizes this can be done quite easily by making slight alterations to the measurements given.

The kind of wood to use is an important point to consider, and as the server will, no doubt, be placed in a prominent position, it should be something that is attractive. A wood that will harmonize with the sideboard or other furniture in the room and preferably a hardwood such as oak, walnut or mahogany would be very suitable. If you can obtain wood with a good figure it would add considerably to the attractiveness of the finished article, especially if nicely french polished or varnished.





With the exception of the two drawers all the wood used is ¼in. thick, and even these can be made by gluing three pieces together to produce the required thickness. By cutting the base first and then building the other parts on to this the job of assembling will be simplified somewhat.

Make the baseboard 6¼ins. long and 7ins. wide and round off the top edge all round as shown in the drawing. Now cut the two sides and the middle partition which are all the same size, and fix them to the base. These are 9ins. long and 5¼ins. wide at the bottom, while the top end tapers off to 2½ins. Glue all three pieces firmly to the base, adding a few fine panel pins driven in from underneath for extra security. The distance between each of these pieces which will form the two compartments for the biscuits will be exactly 2½ins.

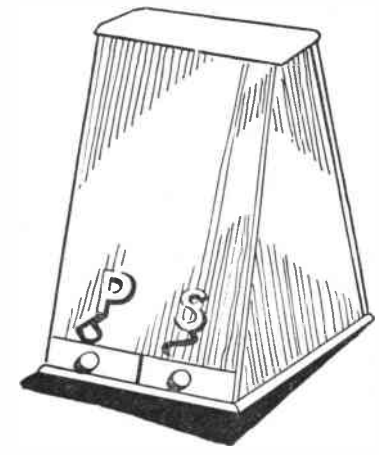
The backs to the two compartments are fixed next, as it might be a little difficult to get them in the exact position after the front is fitted. Cut two pieces of wood 8½ins. long and 2½ins. wide and glue them in position as shown in the side view. There must be a gap of ¾in. at the bottom for the drawers to pass in and out, and the bottom edges of these compartment backs must be very slightly bevelled, also the fronts.

Small corner blocks can be glued to the compartment backs to hold them secure if desired and they will not be in the way, as the triangular space behind is only to make room for the drawer to shut tight.

Cut a piece of wood 8½ins. long and 5¼ins. wide for the front and glue this firmly in position, leaving a gap of ¾in. at the bottom as before. When the glue is set we next fit the drawers and there are two ways of making them.

They can be cut in one piece or made to the necessary thickness by gluing three ¼in. pieces of wood together for each one. The latter method is probably the easiest, as the gap in the front for the biscuits to fit into can be kept to one board thick, while the back portion consists of two more glued on top: two drawers each 5¾ins. long and 2½ins. wide are needed.

The drawer fronts 2¾ins. long and ¾in. wide, are glued on afterwards and don't forget to bevel the front slightly to



enable them to fit snugly. Make the drawers to slide in and out easily. A ¼in. square strip of wood will serve for the drawer stops and these can be glued in the correct position before the back is fitted on. Two small knobs fitted to the fronts of the drawers will finish these.

The back is 9¼ins. long and 5¾ins. wide and can now be glued in position after the top edge has been bevelled to fit.

For the top a piece of wood 6¼ins. long and 3½ins. wide is needed, and this has all four edges rounded as shown in the drawings. In order to keep the container air tight, it is necessary to make this lid fit closely, and this is done by making two inner caps 2½ins. square and gluing inside the lid. Owing to the slight tilting of the biscuit compartments two edges of these inner caps will need slight bevelling in order to fit correctly.

It will be seen that the sink in the front drawers has been made ½in. deep. This is much deeper than most biscuits and is to allow for varying thicknesses. A square of wood should be cut and dropped into the space, so that when a biscuit is placed on top it is just level with the top of the drawer.

The letters (P) and (S) fixed over the two drawers are cut from thin wood and stand for the plain and sweet biscuits which the server contains. If you always have the same kind of biscuits, you could fit small panels with the names carved on them.

Glasspaper the entire cabinet and finish with a coat of varnish or french polish. The compartments should also be well smoothed and it is advisable to give these a rub over with french polish or a coat of varnish. (A.F.T.)

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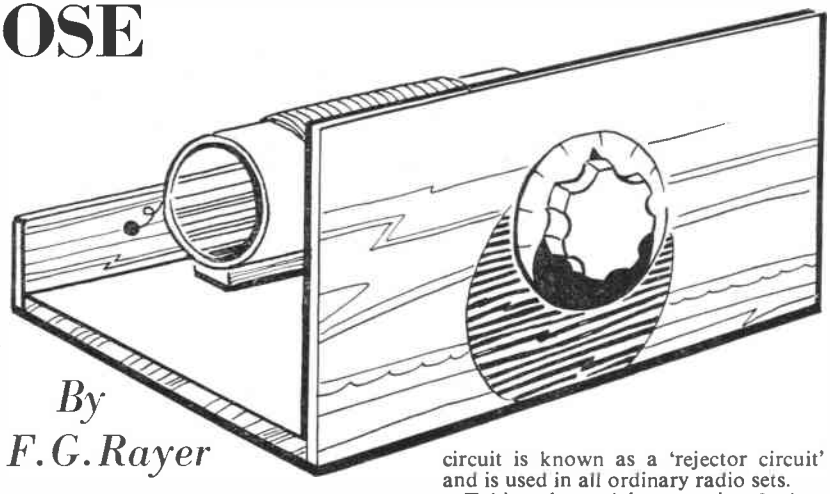
A 4-PURPOSE TUNER



By F. G. Rayer

A TUNED circuit has quite a number of purposes, and if a tuner is made up a variety of receivers, etc., can make use of it.

Fig. 1 shows wiring, the coil being wound for the purpose. The best tuning condenser is an air-spaced one, and should have a maximum capacity of ·0005μF. The actual shape of such condensers varies, but there will be a tag or terminal in contact with the *fixed* plates, and this is wired to terminal 1 on the rear strip. A second tag or terminal will

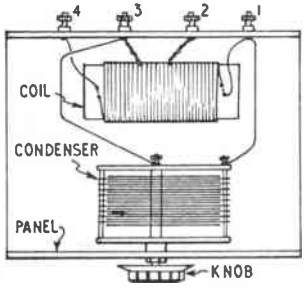


Fig. 1—Wiring plan of the tuner

be in contact with the *moving* plates, by means of a spring contact, ball-bearing, or pigtail, and this tag is wired to terminal 3.

The panel can be of 3-ply, about 4in. high by 5ins. wide, and can subsequently support the on/off switch and reaction condenser, if a 1-valver is made up. A piece of wood of similar size, about ⅜in. thick, is required for the baseboard. The terminal strip is about 1in. high, and should be of ebonite or paxolin.

Tuning Coil

That most generally suitable can be wound to tune the Medium Waves, or from about 200 to 550 metres. An insulated tube 1¼ins. in diameter and 3ins. long is suitable for this, with 32 S.W.G. enamelled wire. The wire is anchored by passing the end through two small holes, leaving enough to take to terminal 1. Fifty turns are wound on evenly, side by side, and a loop twisted a few inches long, to reach terminal 2. Thirty more turns are then wound, and a second loop made to reach terminal 3. Forty further turns are then wound, and the wire terminated by passing through small holes, this end going to terminal 4. All turns must be in the same direction. The completed winding should not be painted, varnished or waxed.

It is possible to use other size tubes and wire, adjusting the number of turns to suit. With a 2in. diameter former and 28 S.W.G. D.S.C. wire, thirty, twenty-five, and thirty turns respectively may be used. In all cases scrape away the covering so that proper contact is made with the terminals. Two small blocks under the ends of the coil enable it to be fixed down with wood screws.

A Crystal Set

As a very good crystal set can be made with the tuner and a crystal detector, this may first be tried. Connections are shown in Fig. 2, the numbered points going to the corresponding terminals on the tuner. Any type of crystal or crystal-diode detector is satisfactory, with the usual medium or high

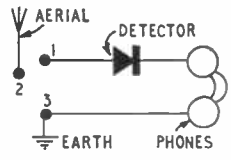


Fig. 2—Wiring for crystal set

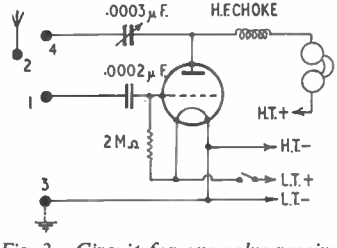


Fig. 3—Circuit for one-valve receiver

impedance phones which are correct for crystal sets.

When the coil is tuned to the desired signal, this signal cannot pass through it to earth, so instead goes through detector and phones, and is heard. Such a circuit is known as a 'rejector circuit' and is used in all ordinary radio sets.

Taking the aerial to tapping 2 gives fair selectivity. If the aerial is short, it may be taken to 1, and this gives more volume. It may also be taken to 4, this part of the coil then acting as an aerial coupling winding. It is also possible to take the detector to 2, instead of 1, and this gives sharper tuning again, because the detector no longer damps the tuned circuit.

One-Valver

If there is no earth, or a poor aerial, and better volume is wanted, a 1-valver is satisfactory, and much more sensitive than a crystal set. A circuit for this is given in Fig. 3. A detector type valve, with holder, is required. An excellent type, cheaply available from ex-service stockists, is the HL2. A ·0002μF fixed condenser is necessary, and 2 megohm grid leak (or similar values). The ·0003μF condenser is used for reaction, which greatly increases the volume of weak stations. The H.F. Choke is of the usual type; with some phones the set will function quite well if the choke is omitted.

The various points are taken to the tuner as numbered. For H.T., 45 V to 60 V is suitable. For L.T., 1·5 V or 2 V may be used — the latter for preference. More than 2 V must not be used.

Tuning is exactly the same as in the crystal set, except that after amplification part of the signal returns through the reaction condenser and is again induced in the coil, by means of the section between 3 and 4. This increases volume until a state of oscillation is set up. In use, the reaction condenser is closed until the valve is almost oscillating, and adjusted, as necessary, while tuning. The more powerful continental stations should be heard, with a fairly good aerial, especially during the hours of darkness. The addition of a L.F. coupling transformer, 2nd valve, and

● **Continued on page 142**

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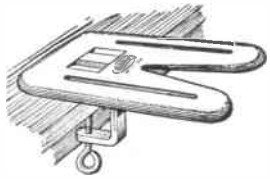

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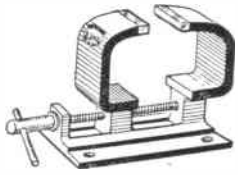

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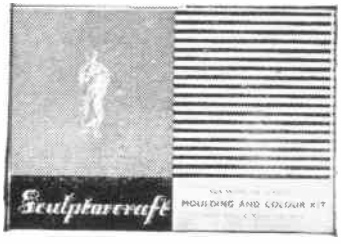

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● **Continued from page 140**

4-Purpose Tuner

speaker, would give quite good speaker results from local B.B.C. stations.

Wavetrap

If the unit is wired in series with the aerial lead to a receiver, and tuned to an undesired (interfering) station, it will prevent this signal passing to the receiver. This method of operation is most effective with the simpler type of receiver and the unit should be near the set, with only a short lead from it to the aerial terminal of the latter.

The aerial itself may be taken to 1 or 2, according to the sharpness of tuning wanted. In bad cases, a condenser of 50pF or 100pF may be added in this connection, to sharpen tuning more. Terminal 3 is taken to the aerial socket.

In use, the wavetrap is tuned to give minimum volume of the offending station. It may be used, in this way, with a crystal set.

For use as a band-pass circuit, the tuned circuit is added before that already in the receiver. Again, the improvement will be most easily noticed with the simple type of set, where tuning is not very sharp.

Terminal 3 is taken to Earth on the receiver. The aerial is taken to terminal 2 or terminal 4, the best being found by trial. A small fixed condenser is then wired from 1 to the aerial terminal on the receiver. To use in this way, the tuning unit is tuned simultaneously with the tuning control on the receiver. In effect, this adds a tuned circuit. The improvement in sharpness of tuning will be particularly clear in sets with only one tuned circuit.

The small fixed condenser wired from 1 may consist of two lengths of insulated wire twisted together for about 1in. to 2ins. The greater the overlap, the greater will the capacity between the wires be. If the capacity is too great, the full improvement will not be had, while if the capacity is extremely small, much volume will be sacrificed. The effect of varying the amount of wire overlapping should thus be found by experiment.

To tune Long Waves, many more turns are wanted. On a 1¼ins. diameter tube, 360 turns, in all, of 34 S.W.G. enamelled wire, will be suitable. The 360 turns should be divided into 3 piles, of 120 turns each, separated by about ¼in. This will give 120 turns between 1 and 2, 120 between 2 and 3, and 120 between 3 and 4.

The tuner can also be used on short waves. About 17 to 60 metres will be best, and 20 S.W.G. bare wire can be used on a 1¼ins. former, turns being spaced from each other by about the diameter of the wire itself. Five turns will be required between 1 and 2, with 4 turns between 2 and 3, and 7 turns between 3 and 4. With a crystal set, only very powerful stations can be heard, when conditions are good. But with a 1 or 2 valver, distant stations will be heard, if the set is kept on the point of oscillation by means of the reaction control. The H.F. Choke will be necessary, and 1 must be a short wave type, or able to cover 17 to 60 metres. Two-hundred and fifty turns of 36 S.W.G. silk-covered wire, in five piles with 50 turns in each, on a ¼in. diameter former, will act as a short wave choke, for this circuit position.

Portable All-Dry 2

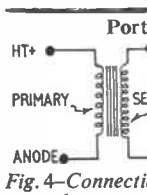
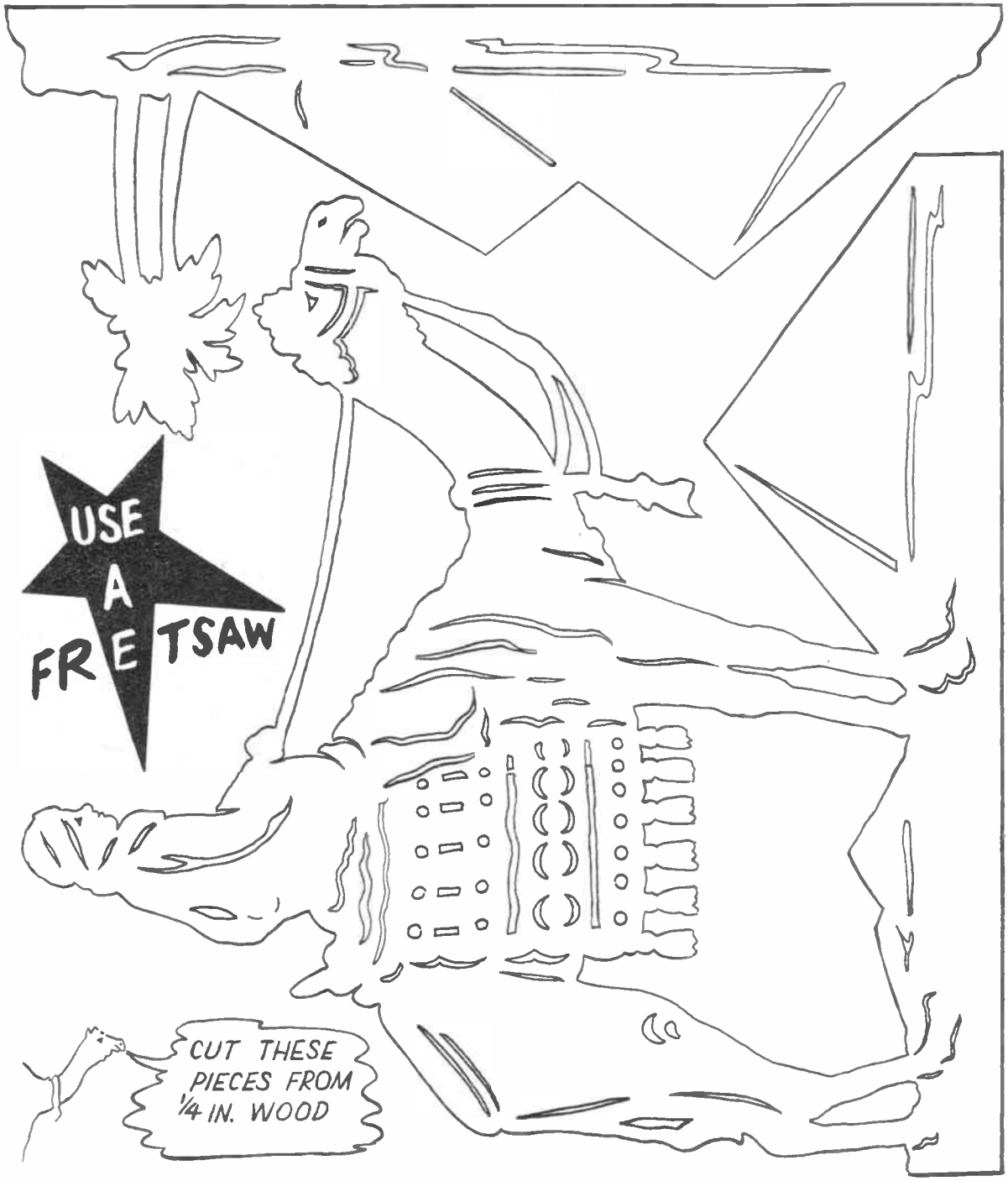


Fig. 4—Connections for transformer coupling

In an article describing a Portable All-Dry 2 Radio in Hobbies Weekly on April 25th, Fig. 4 was inadvertently omitted and it is printed here to assist those who are making up the set.

See page 131

Patterns for Cacti Display Stand



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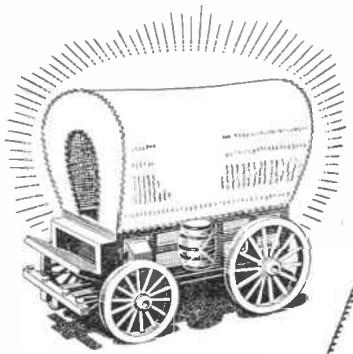

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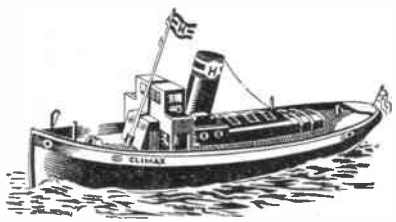

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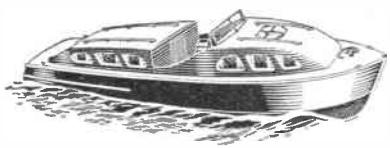

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