

Hobbies

WEEKLY

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In the absence of a refrigerator, some form of keeping milk, butter, etc., fresh in hot weather is very desirable. In fact it is necessary if waste of good food is to be avoided. The ice box, illustrated, comes in invaluable here, as it will keep provisions fresh in the hottest weather.

Ice Wanted

A supply of ice must be assured, but this should not prove difficult in most districts, and the quantity needed is quite small. It might pay, in fact, to purchase one of those home ice-makers so frequently advertised during the summer months for the supply, especially as such a machine could be used for making ice cream and iced dishes for the table, as well.

The box should be of solid construction. Quite likely a good strong one could be bought at the grocers and be

suitable for the purpose. If not, a few feet of $\frac{3}{4}$ in. deal board could be used to make it. Some useful dimensions are given in the diagram, Fig. 1, for the box, and should provide sufficient space for a milk bottle, butter dish, and meat or fish dish. One side of the box is omitted to allow of the interior arrangements being shown.

The corner joints should be well glued and nailed, and a stout bottom glued on, not the more usual one of

thinner wood. Those who do not mind a little trouble could dovetail the corner joints, with advantage, even a rebated joint would be better than just a plain butt joint. Clean up the work when the glue is hard and see that each joint is close up—not gaps anywhere.

Lid Rest

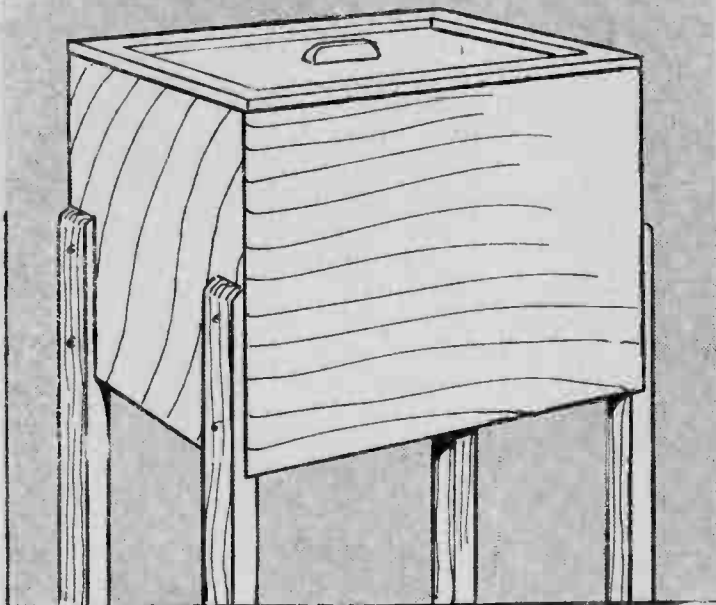
At a distance down from the top, equal to the thickness of wood to be used for the lid, glue and nail across $\frac{1}{2}$ in. by 1 $\frac{1}{2}$ in. wood fillets, as shown at (A). One is fixed to one end of the box, the other at a distance of 3 $\frac{1}{2}$ ins. from the opposite end.

On these the lid will rest. Between the latter fillet and the box end, nail $\frac{1}{2}$ in. by 1 in. fillets across. These support the ice tray. Note these fillets are set $\frac{1}{2}$ in. below the top of the cross fillets, so that the lid will not contact the ice tray.

Directly underneath the cross fillet mentioned above fix another, of similar section to the bottom of the box. This is shown at (B) and keeps the draining tray in place. At this stage it may be mentioned that the ice tray is placed to rest upon the short fillets above, and the draining tray directly below it, on the bottom of the box, so that the ice, as it melts in the box, will drip into the tray.

Metal Trays

For these trays some sheet zinc will be required, of fairly stout gauge. They are quite easily made, even by the amateur. For the ice tray, mark out on the zinc the pattern shown in Fig. 3. Bend up the sides and ends on the dotted lines, and press the corners together, as at (C).



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Bend these corners over to the sides, and hammer lightly down, and the two end flanges bend down at right angles, as at (D). Punch some drainage holes in the bottom of the tray for the ice water to drip through.

For the drainage tray, a similar pattern will suffice, but is made just a little longer, say, 11½ ins., and the end flanges omitted, as these will not be wanted, the

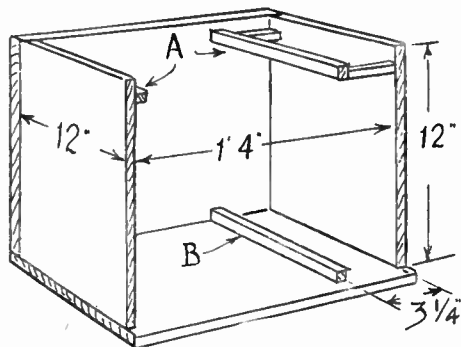


Fig. 1—General construction of box

tray resting on the bottom. It is bent to shape, exactly as the ice tray, and then both can be tried in position, to see they fit well in place, and are easily removable.

A lid of stout board is made, preferably from tongued and grooved wood, glued together. Make it of a size that will enable it to fit closely in the box, and rest upon the fillets, but do not overdo this fitting and make the lid difficult to fix on, or take off. Any

tugging or forcing to get the lid off might shake the milk bottle over.

Round the edges of the lid, strips of ½ in. by 1½ in. wood are glued and nailed, these strips overlapping the edges of the lid enough to cover the box. The detail sketch in Fig. 2 shows this. To the lid

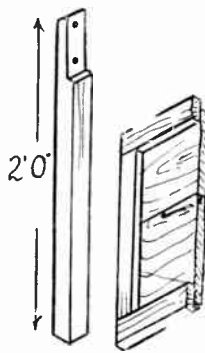


Fig. 2—Leg and lid strips

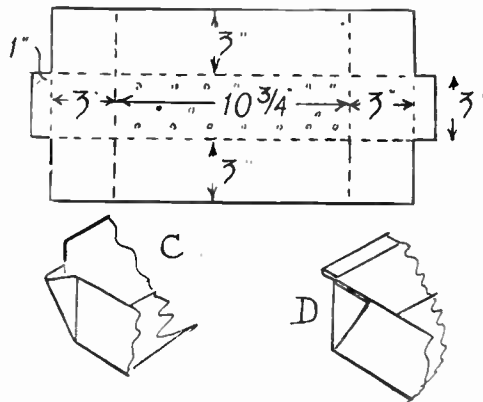


Fig. 3—Shape and corner joint of tray

screw a knob or handle for lifting purposes. A metal handle would, perhaps, be as good as any one of the folding box variety, for example, as it would take up least room.

Raised on Legs

If the box is to stand on some support, it will do very well as it is, but if not, the addition of legs would prove a great advantage, saving a lot of stooping down

The inside and outside should be given two coats of white paint, and then a finishing coat, either of glossy white or enamel. Take some care, when painting, to seal the corner joints as much as possible.

The ice is crushed and packed in the ice tray. It should, preferably, be replenished daily, and the draining tray emptied as becomes necessary. Beyond this little attention is necessary. (186)

How to make a HECTOGRAPH

IF you are secretary to a club or committee or sometimes faced with the task of preparing, say, 40 or 50 copies of a letter, then a hectograph will prove a boon. It does not entail the use of a typewriter or stencils, and the apparatus is simple and inexpensive to make.

A hectograph is merely a gelatine pad upon which has been impressed the hand-written original of which additional copies are required. Although it is possible to buy a solution for making the graph and also a specially prepared ink, we will consider how to produce the whole outfit ourselves.

Materials for the Jelly

First we require a shallow tin dish—the lid of a biscuit tin would be ideal.

Now to prepare the gelatine composition, for which you will require:

- 1 oz. of gelatine.
- 1 oz. of brown (Demerara) sugar.
- 6 ozs. of glycerine.
- 2½ ozs. of barium sulphate.

With the exception of the sugar, all these ingredients may be obtained from your chemist. (Incidentally, their total cost will be only about one-quarter of the commercial gelatine pad).

Cut the gelatine into small pieces and place in an old saucepan with three ounces of water, allowing it to soak for twelve hours or so. Add the glycerine, heat slowly over a low gas and then add the sugar. As soon as the sugar has dissolved, mix the whole thoroughly. This done, mix the barium sulphate with one ounce of water and add to the mixture in the saucepan, stirring well.

Place the lid of the biscuit tin on a perfectly level surface (this is important), and then pour in the composition mixture. Watch for any air bubbles and prick them if present. When the gelatine is set, the pad will be ready for use.

Home-made Ink

As already stated, hectograph ink may be bought, but here is the recipe for making your own. Ask your chemist to place in one bottle two drachms of methyl-violet aniline and two drachms of spirit. Add water sufficient to make one ounce of ink (or ask the chemist to add it for you). Shake the bottle well until the aniline has completely dissolved, and the ink will then be ready for use.

We are now all set to try a few trial copies. It is important to write the letter or circular on a smooth-surfaced

paper (such as cream or blue laid). Duplicating or typing papers and 'bond' papers do not give the best results.

In Use

As soon as the writing is dry, place the sheet, writing downwards, on to the gelatine pad. Rub the paper gently but firmly with a soft pad, being sure it does not slip while so doing. Leave the paper in place for not less than ten minutes. You should then carefully peel the paper off the gelatine pad from the corner, when you will see a clear impression of the original writing on the composition.

Take a few sheets of paper and press each one for a second or two over this impression and if all is well, you should have some excellent copies. You should be able to take 40 or 50 copies before the ink on the gelatine becomes exhausted.

After use, and in order to erase any writing from the pad, sponge it carefully with cold water and leave to drain. A few hours should be allowed to elapse before making another impression on the composition.

If you do not wash the jelly immediately the ink will sink in and the jelly will then have to be boiled, and the top skimmed off. (181)

Some hints on the construction of various types of AQUARIUM AERATORS

If fish are kept in a suitably aerated tank there is no necessity for the water to be changed and a greater number of fish can be accommodated in the same volume of water. For a permanent aquarium the old and well-known rule which states that one gallon of water should be allowed for each inch of fish need not remain applicable when mechanical aeration is employed.

Where plants and the surface of the water in contact with the air form the only means of replenishing the oxygen used by the fish a four-gallon tank could only hold two 2in. fish, or a proportionately greater number of smaller fish, assuming the water is never changed. This can, of course, be quite satisfactory. Nevertheless, the opportunity of introducing more fish is one many may like to take.

Types of Air Pump

The first requirement is an efficient air pump, and many different forms are practicable, four of the best-known being shown in Fig. 1.

Rotary blowers are cheaply obtainable from ex-service stores and can be operated from the mains with a suitable transformer. They deliver a very high volume of air, but at low pressure, which means that the aerator jets should be of large diameter and not too deep in the water. If the jets are small, or submerged deeply, the average rotary blower will not provide sufficient power.

Such a blower is shown at (A) in Fig. 1 and has a certain field of usefulness provided the foregoing is remembered. It will be found that any attempt to build up high air pressure with such a unit will fail.

Piston Pumps

An efficient pump which will give ample pressure is shown at (B). The crank, driven from a motor through suitable reduction gearing, moves the piston backwards and forwards in the cylinder. Two valves are connected to

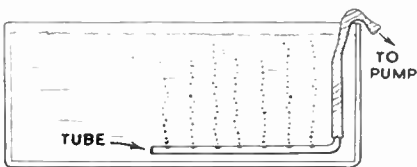


Fig. 2—Aerator jets

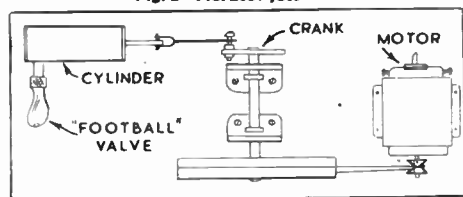


Fig. 3—Plan of a simple piston pump

the tubes leading from the cylinder so that the air is drawn in through one pipe and forced out through the other. The supply of air obtained will depend on the size of the cylinder and speed of rotation of the crank.

The aerator jets for such a pump can be very fine and at the bottom of the tank, thus giving the maximum opportunity for proper aeration of the water.

Water Pumps

Where there is a plentiful supply of running water types of non-mechanical pumps can be used. That shown at (C) makes use of a long vertical pipe with a funnel-shaped top, into which water drips fairly rapidly. If a glass tube is used it will be seen that the drops pass downwards with large air-spaces between, this causing a continuous flow of air from the bottom of the tube. If the tube is long, sufficient pressure will be developed. The flow of water from the tap is not necessarily under pressure.

Where water under pressure is available the method shown in (D) can be used and occupies much less space. A strong jet of water is directed into a tube with a funnel-shaped top from a distance of about 1in. This carries many bubbles of air with the water coming from the lower pipe. The small tubes can be supported in a larger tube, holes for the entrance of air being left in the disc supporting the jet.

With both these methods the outflow will consist of both air and water. It is best to trap the water in a suitable tank through which the supply tube passes, the tank being airtight and fitted with a siphon so that it empties automatically.

Aerator Jets

The easiest way to make these is to take a length of copper or brass tubing which can lie along the bottom of the tank and to close one end by flattening or soldering. A number of small holes can then be drilled along the tube, as illustrated in Fig. 2. A rubber tube connects the completed arrangement to

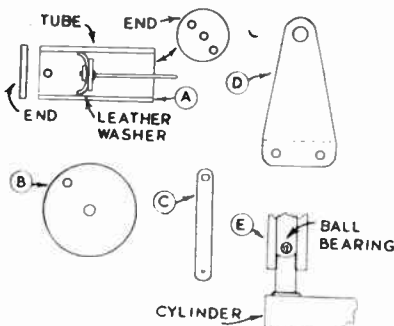


Fig. 4—Detail of the parts

the air pump.

Other arrangements will suggest themselves. A small 'rose' similar to that on a watering-can is suitable for use in a corner of the aquarium. The aerator should be made from some material which will not rust or otherwise contaminate the water.

A Piston Pump

As this is generally the most satisfac-

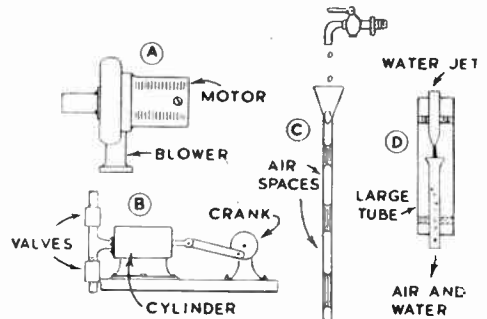


Fig. 1—Different types of air pumps

tory Fig. 3 shows how such a pump can be made up. An electric motor is shown for driving, and this, operated from the mains, is the only really practicable method, in view of the long periods of running which are necessary.

The motor drives the crank through a belt reduction drive, though gearing could be used if suitable parts are to hand. The axle is pivoted in two stout brackets, which may be bent up as shown in Fig. 4 (D). Washers or bushes soldered on prevent sideways movement of the axle.

The Cylinder

The best size and length of this naturally depends to some extent upon the power of the motor, but something between about $\frac{1}{2}$ in. to 1in. diameter and $1\frac{1}{2}$ in. to 2 $\frac{1}{2}$ in. long is suitable. It can be made from brass tubing, with a disc soldered in place to close the end.

If an old cycle pump is available, this can be used, even if not made from metal. Here, the end will already be closed and suitably threaded for a football type valve, such as is used for inflating footballs from a tyre pump. A length of about 2ins. should be carefully sawn from the pump barrel at the connection end.

A section through the cylinder and piston is shown at (A) in Fig. 4. As the piston is withdrawn, air passes round the leather washer. When the piston is being forced inwards, however, the washer is expanded by the air against the walls of the cylinder, thus assuring that the air passes out through the hole at the end of the cylinder. The leather washer should not be a tight fit, and it

should be softened with lubricating oil if stiff.

The crank is made from a disc, shown at (B), with a small bolt to pivot the link or connecting rod. The diameter of the disc is such that the piston makes a good movement in the cylinder, yet does not foul either end. The link (C) is made from two pieces of fairly stout metal soldered together, the ends being opened so that one goes each side of the piston-rod, as seen in Fig. 3. To hold the piston-rod central in the cylinder, an end with air-holes is soldered on, as shown at (A).

The Valve

If a piece of a cycle pump has been used the valve can be screwed into the end. If not, it will need to be soldered in a suitable hole either at the end of the cylinder, as in Fig. 3, or in the disc closing the tubing from which the cylinder is made. A suitable piece of rubber tubing can be pushed on the end of the valve to take the air to the aerator tubes.

If a valve is to be made, this can be

done as shown in Fig. 4 at (E). A piece of small-diameter copper or brass tubing is soldered upright in the end of the cylinder. Its upper end should be filed perfectly flat, then indented slightly with a countersink drill so as to form a seat upon which a ball bearing can rest to form an almost airtight valve. A tube of slightly larger diameter fits over the small tube, as shown, and the rubber tubing is finally pushed over the top end of this larger tube.

If the ball bearing is new (a rusty or worn one is useless) and a little care given to preparing the end of the tube on which it rests, this valve will function very well, especially if a spot of thick oil is put on the ball.

The whole pump should run easily and smoothly, and construction will be greatly facilitated if a few suitable parts from the well-known boys' toy are brought into use.

To even up the flow of air with a piston pump, and to avoid having to use two cylinders, a fairly large air-tank should be included in the supply pipe to the aerator. A large tin, soldered at the

joints, can be used. It will equal up the pulsations of air coming from the pump, giving out a steady pressure of air so that the aquarium jets do not start and stop with each movement of the piston.

The undesirability of keeping fish in an oxygen-starved state is too obvious to need mention, and it is much better to keep a smaller number of fish so that they have a plentiful supply of well-aerated water. If the fish rise to the surface and breathe the water there, showing no sign of going deeper, this shows the oxygen in the water is becoming exhausted.

The old method of keeping goldfish, changing the water once or twice daily, is the least satisfactory method. By using a larger aquarium, aerating the water thoroughly, and making up a 'natural' setting of weed, sand, stones, and so on, the necessity for changing the water is removed. Small fish caught from streams and brooks can be kept with perfect success, and a final refinement, well worth while, is to carry buckets of brook-water to fill the tank. Tap-water is not normally suitable. (163)

The camper and hiker should know these hints for FIRE LIGHTING IN RAIN

EVEN the most enthusiastic camper will admit that it sometimes rains in camp; and that it not only rains, but it pours! Under these conditions, getting a fire going is rather a trial, but providing you can light a fire and keep it going under normal conditions, the following hints may prove useful when you are called upon to light a fire in the rain.

Cooking Coverage

The main point to remember is that once a fire has been got going, the cooking utensils will keep the rain off, whilst the heat of the flames will soon dry damp fuel. If you are in a large camp you will probably have a cooking shelter as well as a Primus or two, but I am writing for the benefit of those fellows in a small hike tent.

A fire can be lit on the leeward side of a tree, i.e. the side away from the wind and driving rain (Fig. 1), but great care must be taken not to make any burn on the bark. Many campers know the old trick of starting a fire in a frying pan (Fig. 5). It will not hurt the pan, but it will harm a tent—especially a midget one if you try to start the fire inside the tent.

Candle Starter

A favourite method employed by the writer of these notes is to cut up a half of a candle into about four and arrange the pieces in the plate of a Gilwell or similar cooker (Fig. 4). Light all the little pieces of candle and over the edges of the plate lay thin twigs, followed by thicker stuff. When the lot is built up, take it out of the tent, and place it under the billies, etc.

To avoid accidents, the whole lot

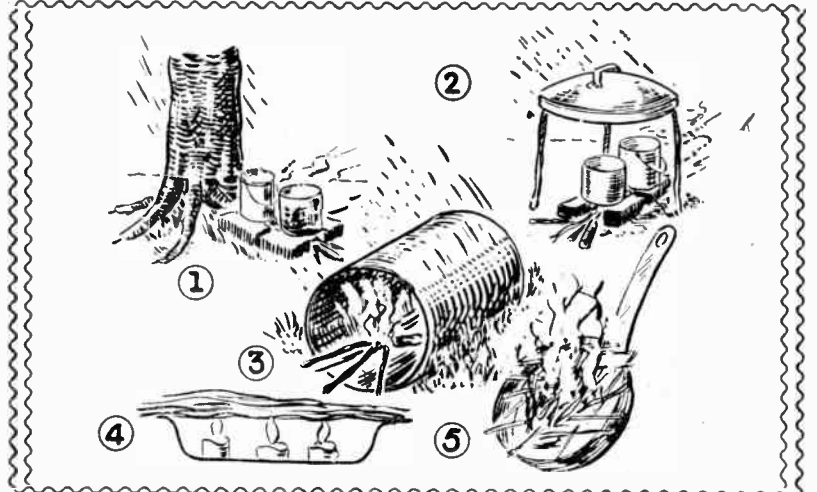
is taken out of the tent immediately the candles are lit and, of course, as soon as the wood is burning, the tin plate is removed. A freak method, no doubt, but one that is justified when it is raining like the very dickens.

At most regular camping grounds an array of dustbins may be found. You can lay an empty one on its side (Fig. 3)

matches before you start off. This is easily done by melting an old candle down in a tin, and dipping the matches in it, afterwards laying them on a sheet of newspaper for the wax to solidify.

Ensure Dry Wood

Another point to remember, is to keep a supply of dry wood under cover,



and start the fire in that. Alternatively the lid, supported on three sticks, will form a 'roof' to keep off the rain (Fig. 2). As you know, many country villages do not have a dustman to call on them, and have to dump their old iron, etc., in a recognised place. From such a dump you can often scrounge an old bath, or some such article which you can use as the basis of a camp stove.

Do not forget to waterproof your

especially that small stuff generally called 'punk'. The writer is by no means a perfect woodcraftsman but he has never yet failed to get a fire going even under the most adverse conditions. It needs some patience at times! Have you ever practised that 1910-ish Boy Scout old stunt of lighting a fire in a puddle?

Lastly, do not be tempted to use petrol or paraffin oil on the fire. Accidents sometimes happen! (156)

Any youngster would get pleasure from this SMALL SAILING BOAT



THE type of sailing yacht shown on this page is always popular with the youngsters who look forward to a seaside holiday.

The outstanding feature of this toy is that it is of the simplest construction, and could easily be made in an evening, with, of course, a little extra time allowed for the paint to dry and harden.

The length of the boat is 12 ins., and its width or beam 4½ ins. Although a bowsprit is not shown in our model, one could easily be added to give a little more character. Another little addition, too, could be made if it were found that the boat had a tendency to turn turtle in the water when the mast and sail are erected and a full breeze blowing. This addition would be a piece of, say, ½ in. wood about ½ in. or ¾ in. wide nailed on the hull to form a heel. It would, of course, be put centrally along the underside of the thick hull piece and nailed or screwed from inside. The glue suggested for fixing the several parts must be the waterproof variety which can be purchased these days.

The Hull

The hull is cut from a piece of 1 in. thick deal, free from knots and with straight grain. Set out one half of the

shape direct on the wood—a piece 12½ ins. by 5 ins. being adequate. The shape, being so simple in outline, can well be got from that shown in Fig. 1.

A centre line should first be drawn across the wood, as shown. Trace off this half outline and draw in the centre line on this tracing before turning over the tracing to complete the shape, this latter process being helped by the use of a piece of carbon paper. Cut round the outline with a fretsaw and

clean up with glasspaper.

Next cut a little notch in the bow or pointed end for the piece (A). This piece is 2½ ins. long by ½ in. wide and ¼ in. thick. The stern board (B) will be 3 ins. long by 1 in. wide by ¼ in. thick and it will rest in a shallow rebate cut in the hull, as seen in Figs. 2 and 3.

Next there are the cross pieces (C) and (D) (Fig. 2) and each is made up of two thicknesses of ¼ in. pinned together. The lengths of these pieces can be calculated from the plan (Fig. 1) after the measurements shown are set out on the hull piece. Clean off the ends of the pieces level with the hull sides so that the correct curve is preserved throughout.

The Sides

For the sides of the boat take the measurements direct from the already made-up hull, allowing a trifle in length for chamfering at the bow and fitting to the stern. Thin wood should be used for the sides, and from the side view, above the plan, in Fig. 1 it can be seen

how the sides taper slightly from bow to stern—from 1½ ins. to 1¼ ins. This depth is sufficient to allow a lap of ½ in. on to the thick heel piece. This is seen by the dotted line in the above diagram which indicates the amount of lap throughout its length.

Bore quite small holes in the thin wood at the bow and stern, and after coating the top part of the hull with glue, bend it round and tack it to the uprights at bow and stern with fine ½ in. brass fret pins. A good idea to hold the sides well in place, and in close contact with the hull, is to put over a number of elastic bands at intervals along the sides until the glue has thoroughly hardened.

Bow Stiffener

A general clean up should now be made, and the sides and hull gone over with fine glasspaper. To strengthen the fixing between the sides and the bow upright glue in the shaped piece (E), as seen in Fig. 2. The actual size of the piece is marked out direct from the model. See the actual piece fixed in place, Fig. 3.

There is a stern post next to be fixed, as (F) in Fig. 4. It should be 1½ ins. long, ¾ in. wide and ¼ in. thick, glued and pinned firmly in place.

The whole boat should now be coated with red lead paint and afterwards rubbed down with fine glasspaper. Follow with two coats of oil paint brushed well into the grain of the wood and into the joints along the sides and back.

For the rudder (G) a piece of ½ in. wood about 2½ ins. long is shaped, as
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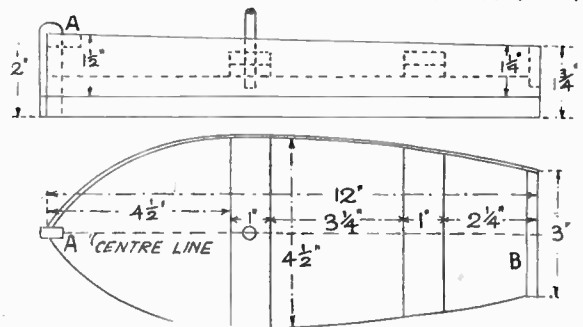


Fig. 1—Side view and plan with dimensions

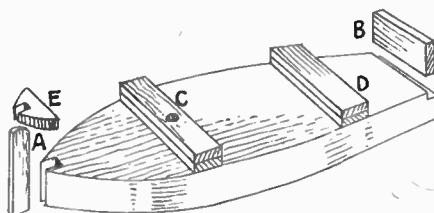


Fig. 2—Showing details of construction

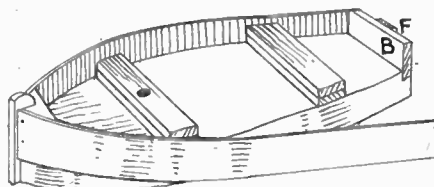


Fig. 3—How sides are fitted

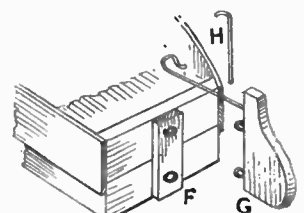


Fig. 4—Stern and rudder

Even with a cheap camera the amateur can undertake NATURE PHOTOGRAPHY



A simple suitable 'hide'

If you are looking for a hobby with plenty of thrills and adventure attached to it, nature photography should be right up your street. Strictly speaking, this branch of camera-craft covers a host of subjects—trees, flowers, butterflies and so forth—but at the moment let us think in terms of animals and birds.

For many years past, hunting with a camera has been one of the writer's chief hobbies. It is a thrilling moment, setting out with new film in your camera in the hope of outwitting the cunning of the wild folk. Sometimes the trek homewards is with the whole film used up—and sometimes without having opened the shutter at all! You never can tell what the day (or night) will bring forth.

With a Simple Camera

If you are thinking the hobby is only for those who can sport super cameras of the £100 breed, be assured that all the photographs reproduced here were taken with a modest folding camera having an f4.5 lens and shutter speeds up to 1/100th sec. The camera is mounted on a light-weight metal tripod and sometimes use is made of a second-hand telephoto lens which cost £2.

A telephoto lens is a great asset. It enables you to either (a) obtain a larger image on the negative, or (b) operate at a greater distance from your subject. Both are very helpful when dealing with such wary animals as the fox, for instance. Even if your camera has a fixed focus (which prevents you getting closer than 6ft. or so from your quarry) you can still do a fair amount of work by fitting a portrait lens which permits you to operate at a minimum range of about 3ft.

Actually, the author has taken a good badger study by flashlight without using supplementary lenses, but it should be remembered that Brock is a fairly large animal. In any case, you should always use the fastest and finest grained film you can obtain so the negative will give good enlargements.

To begin with you cannot do better than concentrate on water birds. Most of these—grebes, moorhens, coots, swans, etc.—are quite sizeable and often oblige by remaining motionless or swimming leisurely on a straight course, thereby making high shutter speeds unnecessary.

A 'hide' is essential.

It need not be elaborate, but it must screen you completely from your quarry. After experimenting with several home-made models, one of the most successful was made by using three 7ft. saplings draped with sacking after the style



The Skylark's Nest

of an Indian wig-wam.

In order to maintain all-round observation you should cut two small flaps in each of the three sides—one aperture for the camera lens and the other for use as a peep-hole. Camouflage the hide to blend with its background and do not forget to install a seat or stool of some kind, as you may have to spend three or four hours in ceaseless vigil!

It is a good plan to set the hide in position two or three days before you go

into action, if possible, so the animal or bird becomes accustomed to it. Another ruse often employed is for two people to enter the hide and for one to leave almost immediately. Not being good at arithmetic the wild folk who may be watching think the hide to have been emptied!

Photographs of nests and eggs will keep you busy during the spring and early summer. Here, again, the portrait lens comes in handy if you cannot focus down to close range. If the nest is in deep shadow, and you are not using any flash-light gear, get a friend to hold a piece of mirror so it deflects the sun's rays on to the subject.

As far as possible, tie back any obstructing twigs rather than cut them away, as this may cause the bird to desert the nest. Where practical, photograph the nest from above and slightly off-centre, as this will add interest to the picture by bringing in the graceful curves of the side of the nest.

Baits can be used to lure an animal or bird into your camera's field of focus. Badgers are partial to honey and syrup, and Oliver Pike has proved that smoked haddock of ancient vintage tickles their palate! Foxes will investigate almost any kind of flesh food, from a fowl's head to stale fish. But only really fresh fish will interest the otter.

One last thought: patience is more than a virtue—it is a vital necessity where wild life photography is concerned.

It is, of course, equally vital to know the capacity of your own camera. If you have got a new one, try it out on a series of general subjects in order

to accustom yourself to the "feel" of it, and also to know what actual shots it will take.

Then you can concentrate of your nature studies and enjoy the thrill of specialisation in this fascinating subject.

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Eggs of the Blackbird



Little Grebe approaching nest



A snap of the Badger

For pleasure and easy carriage on camp or holiday MAKE PAN PIPES

TAKING musical instruments to camp is a bit of a bother. Piano-accordions are fine for filling up a rucksack! Guitars, violins, and the like, are rather fragile and likely to get spoilt by the damp. Trombones, harpsichords, etc., are also ruled out, so that nothing seems left but mouth-organs and 'musical submarines'.

Here, however, is how to make several home-made instruments which are not merely 'stunts', but are capable of dispensing sweet music. You can buy a tin whistle cheaply at most toy shops, but it is greater fun to make your own in more 'woodcrafty' material.

A Willow Whistle

In the early summer or late spring, cut a piece of willow or green sycamore, about 5ins. long. It should be fairly thin and must be smooth and straight. One end is cut square, but the other is cut at a slant to form a mouthpiece (a). As shown in the drawing (b), and about 1in. from the other, square, end, cut a ring round the bark only.

Now soak the wood well in water, and tap the bark with the handle of a pen-knife, up and down, round and round, for some time, moistening occasionally, and taking care not to bruise the bark. You should then be able to slip the tube of bark above the cut-off from the wooden core (c).

Next, wipe off the sticky sap and on the wooden core enlarge the notch already made by extending it not deeper, but lengthways towards the square end. See diagram (c). Cut a very shallow channel, about $\frac{3}{8}$ in. wide, along the centre between the mouthpiece and the groove just made. (Compare with detail at (f) of the bamboo pipe). Then replace the bark tube in its original position. Take a deep breath and blow.

Altering the Note

A shrill clear note should be heard, but if the results are not pleasing, better results will be obtained if you (a) enlarge the notch or (b) enlarge the air channel cut in the lip.

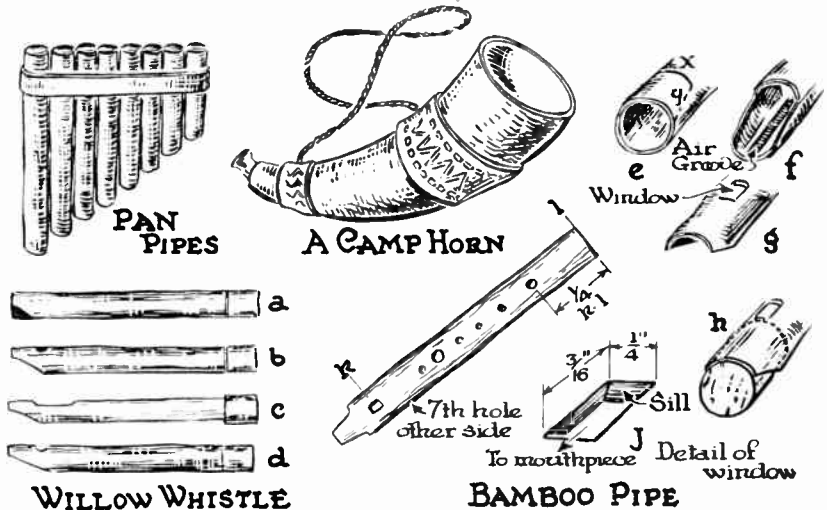
When you have produced a perfect single note whistle you can tackle a similar instrument which will play simple tunes. To do this, take a longer twig, about 9ins. long. Proceed as before, but before removing the bark,

cut a series of holes in the side. The exact position of these is more fully explained in the notes on bamboo pipes which follow. The groove must be carried down past all the finger holes. The instrument will not stand knocking about.

Bamboo Pipes

These are much stronger and are genuine instruments. You can form a

A note will be heard. If you wish to play with others, the pipes must, obviously, be in tune with each other. The usual key-note for a pipe of this type is D. (Get the note from a tuning fork or violinist's pipes—not from a piano, which might be out of tune). The shorter the pipe, the higher the note. You cannot add bits to the pipe, but if the pipe is playing lower than D, saw little pieces off until it does sound



good camp orchestra with them as they can be made in all pitches, from shrill piccolo effects to organ-like groans. Take a piece of sound bamboo about 1in. diameter and 1ft. long.

Clean Bamboo

It must be uncracked and if joints cannot be avoided, have them as near the centre as possible. Bore out the tube so that it is clean throughout. About $\frac{3}{4}$ in. from one end cut about half-way through with a hacksaw (x). Then saw from the other way (y), so making a mouthpiece, as in Fig. f. The lip remaining is about one-third the original circumference.

Well beyond the lip, and in the centre of the pipe, cut a 'window', $\frac{3}{4}$ in. wide and $\frac{1}{8}$ in. long, with a penknife and small fretwork file if you have one. The far side (i.e. the one away from the mouthpiece) is bevelled back to form a 'sill' (see j).

Then cut an air groove leading from the window to the top of the lip. This is the width of the window, and rather less than $\frac{1}{8}$ in. deep. It must be straight floored, not hollowed (f).

Now place a well-fitting cork in the mouthpiece, so that it reaches to the near edge of the window (n). Cut the cork to conform to the mouthpiece and blow.

D (about $\frac{1}{2}$ in. equals a semi-tone, so do not saw too much off at a time).

Lastly, you bore the seven finger holes. The lowest is, from the bottom, one quarter the distance of the pipe between the centre of the window and the end. The larger the hole, the higher the tone. Make it fairly small and by twisting the blade of a penknife in it, or, better still, a four-square rimer bit sold for the purpose, enlarge it.

Keep testing until you hear E (the next note). The holes are $\frac{3}{4}$ in. apart, the seventh being placed underneath, so the thumb will cover it easily. The holes are not necessarily the same size, and whilst tuning, any notes below the one in question are left 'open'.

Camp Horn

A camp horn can easily be made from a bullock's horn cleaned out and fitted with a bugle mouthpiece. As, however, we have had an article on handicraft in bone, we will refer readers to this article for full details.

Most readers will have tried that stunt of blowing across and into a tube so as to get a musical note. The longer the tube, the deeper the note. If several of such tubes, graduated by experiment, are bound together in a line, as in the diagram, we get Pan Pipes—a very ancient instrument. (159)

When answering any advertisements in these pages it will be worth mentioning you saw them in *Hobbies Weekly*.

Little things which make a big difference are MODEL SHIP FITTINGS

ON model galleons, etc., upwards of two dozen blocks or 'dead-eyes' are required. These can be purchased, but for many reasons the model maker often prefers to do the job himself. Even with a lathe, this is a tedious business, whilst it is most unsatisfactory to cut slices from a common wooden dowel, as the grain is very coarse and the finished article fragile.

Again, the groove around the block is difficult to file neatly. Since many articles hitherto made of wood are now made of plastic media, the writer devised the following original way of making deadeyes.

Deadeyes

A good average size for a deadeye is $\frac{3}{8}$ in. diameter, and $\frac{3}{16}$ in. thick (Fig. 3), but the following dimensions can be modified if desired. The deadeyes should be proportioned to the scale of the ship model. First, a mould must be constructed (Fig. 1). Take three strips of $\frac{1}{8}$ in. plywood, plastic or metal, 1 in. wide, and as long as desired, and temporarily clamping them together, drill fine holes along the centre, $\frac{1}{8}$ in. apart.

Separate the pieces, and in the top and bottom pieces, using as centres the holes just drilled, drill $\frac{3}{8}$ in. diameter holes, whilst in the centre piece, $\frac{1}{8}$ in. diameter holes. These holes must be perfectly smooth and clean, with no whiskery edges. Again assemble the pieces and glue them together. When dry, cut along the centre line with a fine fretsaw. Any odd piece of wood will do for a base. At each end, a fence is erected to hold the mould in position.

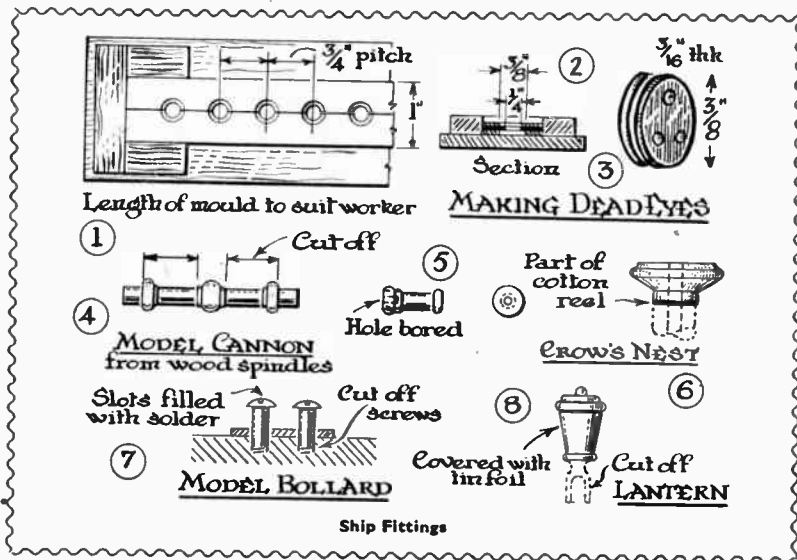
There are various plastic media the worker can try out, from trade preparations to a mixture of rice-flour and water, which has been simmered over a low fire for at least an hour, with just sufficient water to prevent it from burning. The two halves of the mould

are held in the base, and the plastic material pressed in.

It is as well to turn the mould over, to make sure that there is sufficient material on the other side. The three holes on the block can be pricked with a nail. After a few hours the two halves of the mould can be separated and a fresh batch put in. These self-drying media should be left for a few days to ensure that they are properly hardened.

Crowsnests

A crow'snest is easily fashioned from a certain type of cotton-reel, cut down and rounded off (Fig. 6). A bollard, as used on larger ship models, can be made from two large round-headed screws, with the slots afterwards filled in with solder (Fig. 7). A wooden base is made, having holes just large enough to clear the screws.



Guns

The sides of a galleon bristle with ordnance. Fig. 4 shows how the worker who does not own a lathe can devise cannon from small spindles such as are sold at most woodworkers' supply shops. The finished cannon are about 1 in. long. A hole is drilled to represent the bore of the gun, and the whole painted yellow (Fig. 5).

If the hull is solid, the screws may be used full length, but otherwise they may be cut off, and holes previously drilled for them.

A lantern on the prow of the ship model adds a touch of realism. This can be improvised from a drop-handle. The main portion is covered with tin-foil to represent glass, whilst lines are painted to indicate the bars (Fig. 8). (154)

Sailing Boat—(Continued from page 213) shown in Fig. 4 and fitted with two small brass eyes. Two similar eyes in the stern post (F) are inserted so that they come under those in the rudder. A piece of stout wire (as (H) in Fig. 4) is dropped from above to hold the rudder in place so it can turn readily from side to side.

The rudder is controlled realistically from the stern by a tiller arm made from wire which is run into the top of the rudder and bent up to form a handle. The wire must be filed to a point to fit and be driven into the hole in the stern of the rudder.

A hole must now be bored about $\frac{1}{8}$ in. diameter in the foremost cross piece in the boat to take the mast which is shaped up from a length of $\frac{1}{8}$ in. round

rod. The length of the mast is about 8 ins. The spar is about 5 ins. long and tapers each way from the centre, as shown. A piece of $\frac{1}{8}$ in. rod is suitable for the spar which is lashed to the mast with fine thread.

The size of the sail should be gauged from the mast and spar when temporarily put together. It should take the form shown in our sketch illustration.

Two brass eyes are run in to either the stern board or the rear cross board behind the mast. To these the sail cords are tied and carried up to the tips of the spar and the end cords to the sails are also fastened off to the eyes. The sail itself should be of lightweight material with the edges turned over and oversewn.

If a bowsprit is to be fitted it should run alongside the projecting top of

board (A) and be fastened to piece (E). From here it should run back to the mast cross rail where it could be pointed and run into a hole to make a rigid fastening. The bowsprit should be of $\frac{1}{8}$ in. rod and should taper to the bow with a cord attached to its tip running to the masthead in a similar manner to that shown in the sketch.

Finally a little coloured flag or pennant should be fixed to the top of the mast or to a short length of wire and bound with thread to the mast. The mast and spar and bowsprit, if any, should have two coats of varnish. The upper sides of the hull would look well if painted white, and that portion below the waterline red or green. Inside the boat should be light brown and finished well with the varnish to make a good watertight job.

Build an insectarium so you can KEEP LIVE BUTTERFLIES

HERE is a fascinating summer hobby which is also quite out of the ordinary. There are over 50 varieties of butterflies which can be called native to Great Britain, and some of these—if not all—are sure to be flying near your home this summer.

Some people will be catching them, killing them and mounting their gorgeous little bodies on a pin in a glass case; but keeping them alive all summer in an insectarium constructed as described here is much more interesting.

The Box Container

The main part of the insectarium is a large wooden box. Butterflies do not fly in a straight line like birds, but dodge up and down and from side to side, so that the larger the box the better. Too deep a box should not be chosen, however, or your little pets will hide out of your view.

Captive butterflies soon cease trying to escape and spend more time at rest, or walking, than in flight—so that a box 2ft. by 1½ft. by 1½ft. will serve quite well if nothing larger is available.

Such a box (or several boxes to be combined to make one large box) can often be bought very cheaply at your local greengrocer's or grocer's shop.

Glass and Zinc Front

Place the box on one of its sides as illustrated. The front (which was the open top) is then filled in with glass and perforated zinc or close mesh wire netting. It is important that there should be good ventilation, but care should be taken to leave no sharp edges inside the insectarium, or your delicate captives may rip their wings. Folding the edges under in the manner of hemming the edge of cloth, or covering them with wooden strips are both tidy and efficient ways.

The glass observation panel (or panels if the insectarium is large) is held in place by slots, so the glass may be slid up or removed altogether as required. The grooved edge of tongued and grooved

board may be used to advantage, or a sandwich made of three thin boards.

At convenient intervals in the back and sides of the insectarium, round holes large enough to permit the entry of a hand should be cut, and covers—as shown in the illustration—cut out from plywood or other thin wood.

The bottom of the insectarium may be strewn with pebbles, pieces of dry wood or sand if desired. Nothing wet or sappy should be put in, or it will become mildewed or fungus-covered, and may affect the health of the butterflies.

A coat of paint will improve the appearance of the insectarium. A light green or cream inside will show off your captives to good advantage. But do not forget to allow time for harmful odours to disappear before beginning your living collection.

Some flowers are much more attractive to butterflies than others. When catching your specimens, you will soon see what blooms to pick for your Insectarium. They can be put in small-topped jars—or better still stuck through holes punched in a metal cap as fitted on many jam jars. On no account should any large surface of water be left bare. In this small world, butterflies will not have so much chance of avoiding such hazards as in the open.

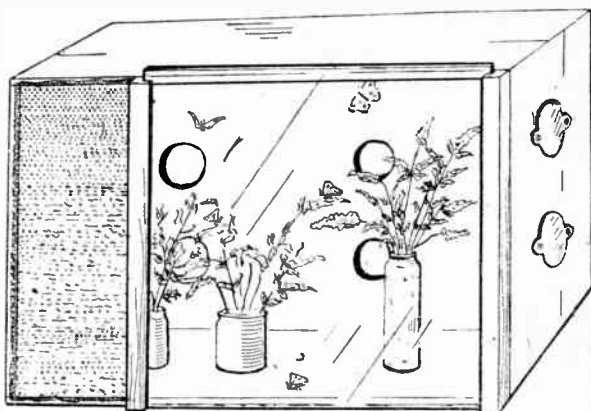
Change Needed

Flowers should be changed as frequently as possible, and at least once a day, and should be provided in amounts according to the number of captives. You will be fascinated to watch them feed by unrolling their long tongues and sipping the nectar from the depths of the blossoms.

The butterflies should be caught as near to your home as possible. Travelling any distance may harm them. A net bag held open by a wire loop stuck into the end of a bamboo stick is easily made if you do not wish to buy one. Little boxes with a few holes punched in them—match boxes if nothing larger is available—will serve as temporary, individual carrying cases for your specimens.

Great care should be taken in transferring them from the net to these boxes. The best way to pick up a butterfly is to take hold of the wings firmly and gently when they are together above the little body. Remember how fragile they are.

Butterflies are sun-loving insects. If you keep them so that they are always in the shade, they will become jaded, but



too much sun through the glass will make the interior like an oven. A few hours sunshine each day is the ideal and a suitable site should be chosen with this aim in view.

The Life Cycle

If you wish you may use your insectarium to follow the butterfly's life cycle right through. When keeping butterflies you will often find that some of them—particularly new arrivals—lay eggs. These will hatch out into tiny grubs if they are left undisturbed, and will grow into caterpillars if you can provide the right food.

As they will probably starve if you cannot provide the right kind of leaf, it is better to find them partially grown, for then you will know the particular kind of foliage they favour as food—and also their size will prevent them from escaping through a crack or the ventilation gauze.

Some are worth keeping because of their strange appearance, and all are interesting to watch as they wind themselves about with a cobweb-like secretion and are finally hidden by the chrysalis they have made.

Books of Reference

Reference to your local free library will give you more information if you are interested in what kind of butterfly to expect from a particular caterpillar. Of course it may be the caterpillar of a moth, in which case it is perhaps best avoided, as being likely to hide during the daylight hours.

You may also be able to find out what kind of flowers are the best food bearers for your particular captives, and also their names. Such knowledge will add to your enjoyment. Painted lady, red admiral, peacock and tortoiseshell are names of some of those you are likely to catch and which are particularly vivid specimens . . . and which will cause admiration in all who see them.

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A Chemistry Hint

SOMETIMES your chemistry soil lamp runs short of oil, and the wick is unable to reach the oil. To overcome this, just add some water to the oil. Since the oil is lighter, it will rise to the top, so the wick is able to reach it. Remember not to add too much water, because the wick might reach it.

Aspiring fishermen should read these notes on ANGLING FOR BEGINNERS

A NGLING is one of the most popular of out-door pastimes; there are well over two million anglers in this country and still their numbers increase. Well, it is jolly fun and very interesting to go a-fishing in the summer holidays and week-ends. Most rivers, lakes, and ponds contain fish of sorts, and there is seldom much difficulty in obtaining a little sport.

Generally speaking, there are no 'free' waters in England. Mostly you have to obtain a permit or purchase a ticket. Many angling clubs control stretches of water, and issue tickets at a cheap rate to non-members. Frequently, such can be had at the riverside inns and from local tackle dealers.

We would recommend the beginner to join an angling club, where he will have the advantage of meeting experienced anglers glad enough to show one the tricks of the craft. He will also have the privilege of fishing in the club's private waters.

Remember, you will need a licence, cost of which varies in different waters and may be obtained from the distributors—usually the tackle dealers. Everywhere in English and Welsh districts a licence must be held for salmon and trout fishing. Even if you have permission to fish in strictly private water a licence is still required.

Equipment

The beginner will require a light cane rod of from 10ft. to 12ft. long, fitted with stand-off rings and reel fittings. A rod with cane butt and middle joint, and a greenheart top, is excellent for all kinds of 'coarse' fishing, i.e. roach, barbel, bream, chub, dace, carp, tench, gudgeon, rudd, and bleak, not forgetting the perch.

The reel may be of the Nottingham pattern, with centre-pin action, carrying 40yds. of undressed silk line or nylon

Trellis Work

WHEN making trellis work with laths, a good idea is to cut a piece of wood the width you require the laths to be apart. This saves a great deal of measuring, and proves to be much more accurate.

Wood Made White

WHEN you have finished with a cycle outfit, keep what is left of the french chalk because when it is gently rubbed on to plywood after it has been glass-papered, you will find it will come up with a white smooth finish.

line. You require gut-casts or nylon casts to connect reel-line to the hook-length; these should be of 3x strength. You can have a 1yd. cast, and to this attach the hook which is mounted on a short piece of nylon or gut, from 10 to 12ins. Or you can buy a 1yd. cast already mounted with a hook.

Short-hook Advantages

The advantage of using a short hook-length is that if the hook gets fast in a snag under water and you have to break away, you will most probably save the cast and thus only need another hook to carry on. Hooks to short gut are much cheaper than those tied to a long cast.

Floats of various sizes must be stocked.

For canals and quiet waters light quills are advised. But for fast heavy water and deep streams, you need a bigger float, as a goose-quill. The goose-quill, porcupine quill, crow quill and those floats made of quill and cork are mostly used for

bottom fishing. Hooks vary in size from No. 3 to No. 16. For general use No. 10 and No. 12 are most suitable. Those hooks known as Crystal are the best for all-round angling.

Sundries include float caps of quill or rubber, to hold the line to the float; split-shot for weighting the cast; knife; scissors (small); pliers for pinching shot on cast; Some anglers use their teeth for this job, but we would say 'do not'; teeth are easily broken! Then you want a bag or basket and a landing-net complete with a fairly long handle.

General Hints

Always see your tackle is in good order. Take a supply of spare casts and hooks with you. Do not forget your baits, and see you have ample supplies. Before setting out, check over the items of your outfit; leave nothing at home that you may want. Do not forget your permit and licence.

Always approach the river bank carefully, fish are easily scared off. Do not stamp about on bank or in boat. Before commencing to fish, place everything to hand, also put the landing-net ready.

Grease your line with Vaseline or other preparation sold by tackle people, in order to keep it afloat on the surface. You have less trouble then when striking, as you get a 'bite' from the fish—a line that sinks and sags low in the water retards quick striking.

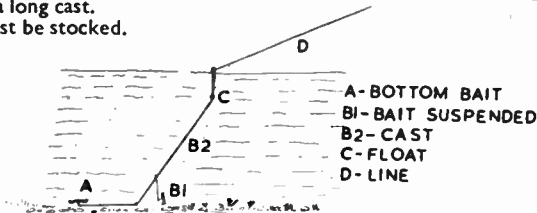
Rub a bit of Vaseline on the ferrules of a new rod to prevent the joints from sticking when you fix up the rod.

Observe the good angler's code of manners. Do not trespass, but be quite sure you are in order before com-

mencing to fish. Do not omit to shut all field gates! Do not leave litter on the bank! Do not damage banks or trample in crops! Do not be awkward if the water-bailiff asks to see your licence or the fish you have caught.

Most anglers nowadays take a keep-net and put all their catch in it to keep the fish alive until end of day, when they carefully return all those they do not want. All undersized ones should be returned after unhooking, and not put in the keep-net. On the back of your licence you will find particulars of the size limits of the various species.

You can carry a rule for measuring



Showing the method of using two hooks

them, or you can cut notches in the landing-net handle giving lengths—say, a notch denoting 6ins., another 7, 8, and so on up to 12ins. This simplifies it—you take your captive out of the landing-net, and then measure it against the notches on the handle; if undersize you put it back into the water.

Popular Fish

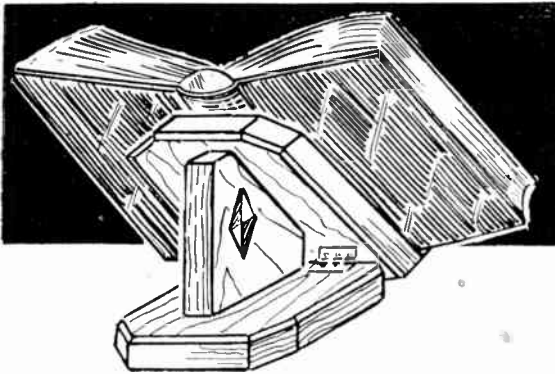
Roach are very popular with float-fishers, for they are well distributed in river, canal, pond, lake, mere, and reservoir. They are grand fish and provide lots of sport. Use fine tackle and a No. 12 hook. Baits include pastes, maggots, red worms, dew worms, creed wheat, hemp-seed, caddis grubs, silk weed, etc.

Stale bread soaked and mashed up with a little bran or meal, or dried bread powdered up small, is a likely ground-bait. Throw a little in from time to time at the spot where you are fishing. Adjust the float so the baited hook travels down just off the bottom of the river. Roach swim in shoals and when you find a good spot where they are located, you should have some fun. The ground-bait will keep them nosing around.

Dace are sportive fellows, found on shallows, in weir pools, and mill-tails. Gravel places are to their liking. They are gregarious and often bite freely. Caddis grubs are good baits, in summer, or maggots. Red worms after a flood are killing. Trot your baited hook down the 'swim', letting it travel without hindrance, paying out line from the reel. Throw in a few maggots occasionally as ground-bait.

(Continued foot of page 219)

Here is a simple novelty in wood—a practical BOOK END AND REST



A GLANCE at the illustration will show the dual purpose of this novel appliance, which is made, of course, in pairs. Oak is a very good wood to use. To avoid ambiguity, the instructions refer to the making of one end.

The base is a piece $4\frac{1}{2}$ ins. by 4 ins. by $\frac{1}{2}$ in. The edges can be chamfered, and the corners cut off, as shown. At $1\frac{3}{8}$ ins. from one end a hole is drilled on the centre line to take a screw. This should be well countersunk. Note particularly that the fore edge is very

slightly undercut, the purpose of which will soon be apparent. It will be of great assistance if a sheet of iron or lead is screwed on the bottom and covered with baize to protect polished surfaces.

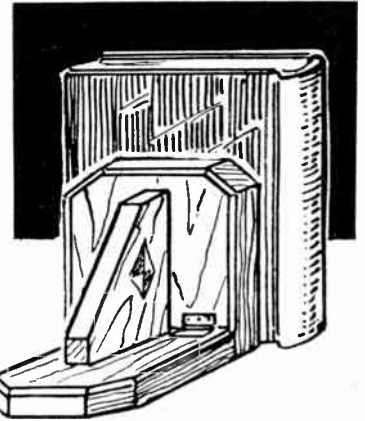
The upright piece is 6 ins. by 4 ins. by $\frac{1}{2}$ in., its edge and corners being treated similarly to those on the base. It is hinged neatly to the base. Along its lower edge a strip of brass, 4 ins. by 2 ins., as thin as is compatible with stiffness, is screwed, to serve as a ledge for books.

The bracket piece is now cut. This is $2\frac{7}{8}$ ins. wide at the base and $4\frac{1}{2}$ ins. high. The vertical and horizontal parts are each $\frac{1}{2}$ in. long. Note that the screw hole is not in the centre. It is $1\frac{3}{8}$ ins. from one end, as shown. This bracket can be decorated with a diamond piece if preferred.

Upon assembling, it will be found that when the bracket is reversed (the tension of the screw being adjusted for

this) the upright has to move a little outwards, otherwise the bracket would be wedged tightly. Hence the undercut part of the base.

When reversed the upright falls back

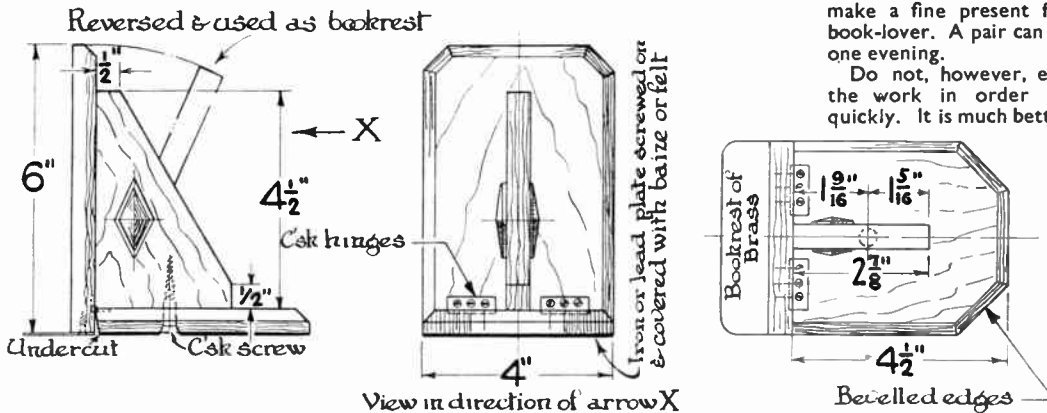


and allows the use as a book-rest—most useful for students. A small triangular space is left in the corner where the hinges are. This saves having a sharp, easily-damaged corner on the bracket.

The whole, waxed polished, would make a fine present for a student or book-lover. A pair can easily be made in one evening.

Do not, however, endeavour to rush the work in order to get it done quickly. It is much better to have a satisfactory piece of work you can show with pride, rather than have to be apologetic for hurry and bad workmanship.

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Angling—(Continued from page 218)

Perch are, perhaps, best of all to start on. They bite boldly, and fight well. Perch take worms readily enough, or such baits as maggots. Perch bite in a different way to dace, for whereas these snatch the bait quickly, pulling the float under with a quick jerk, perch are more deliberate and you can give them time before striking. Perch give two or three tugs, the float 'bob, bob, bobbing' before it goes under. Perch also go about in schools and where you catch one, there you may catch others also. Use a No. 10 hook for these dark-striped fish.

Tench and carp provide sport to

anglers fishing in weedy ponds, meres, and lakes. But in summer you must be out at dawn or just after. At early morning on hot days both these fishes bite well. They attain a big weight and are worth catching for sport, but they are not good for eating. Baits include worms, sweet paste, grubs, snails, slugs, maggots, etc.

One other summer fish is the chub, and again this fish is well worth seeking, being very strong and of good size. Baits are many, including those given above plus cheese paste and fruit such as cherries, and red currants. Hook should be No. 8 or No. 10 crystal.

Some anglers use two hooks when fishing in lakes and ponds or in slow-flowing rivers. One hook is at the end of the cast as usual, and the other is suspended above it, so it hangs 2 ins. or so above the bottom, whilst the end hook lies on the bed (see sketch). There is a disadvantage—when playing a fish hooked on the lower hook, say, the upper one may catch in a weed or other entanglement and cause trouble for you.

Remember, in hot sun-bright periods during summer, the best times to fish are early morning and again at evening up to dusk, or even during the night, when the bigger fish are often feeding.

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Those who like artistic work should make a trial of HANDPAINTED FABRICS

THE art of handpainting on fabric is by no means a new craft, yet it is surprising how large a number of hobbyists are completely ignorant of this fascinating branch of decorative craftwork.

Nothing expensive is required in the way of tools or equipment, and providing a few elementary rules are followed there is nothing to stop the beginner, whether young or old, from achieving really professional-looking work from the start.

Another advantage of this form of pastime is that it need occupy very little room. In fact, it may be carried out on the living-room table without inconveniencing any of the other members of the family—unless they are waiting to do some fabric-painting, themselves!

Equipment

In the first instance, some attention must be paid to your choice of colouring agent. Ordinary artists' oil-colours may be used for some classes of work but as these will only produce successful decorations on certain types of fabric you are advised to try a little of the colour on a scrap of the fabric you propose to use before actually commencing the piece of work itself.

One of the chief faults with artists' oil-colours is that the oil has a tendency to stain certain fabrics, thereby creating a very unsightly blurred outline to a painted motif. Much of this trouble can be eliminated if a quantity of the colour is first squeezed out on to a pad of blotting-paper and allowed to remain there for about an hour so that all surplus oil is extracted before the colour is applied to the fabric.

Special Colours

Fortunately, enterprising manufacturers have placed special colouring agents on the market for hand-painting fabric. They are not expensive. A 3in. tube costs only 10½d., and a wide range of colours is available.

These particular fabric-painting colours can be employed to form a relief decoration on textiles, as well as an ordinary flat coating of colour. And besides the actual paints, small tubes of coloured and metallic powders and minute glass beads can be obtained. These are used as a dusting medium. While the original application of paint is still wet, the powders, flakes or globules are lightly shaken on to the decoration, where they will readily adhere.

Once you have obtained the necessary colours the only other equipment you will require are brushes, scraps of clean rag, a small quantity of turpentine or its substitute, drawing-pins, and either a large drawing board or a sheet of plywood or hardboard.

Among the many articles which look particularly attractive when hand-painted may be numbered: d'oyleys and table-mats of all descriptions, tray-cloths, tablecloths, table-runners, scarves, neckties, cushion covers, tea-cosies, etc.

Designs

The scope for originality so far as the design goes, is, of course, unlimited. If you have sufficient ability with pen or pencil there is no reason at all why you should not design attractive and exclusive patterns for your fabrics. But do not despair if you feel that you are altogether lacking in the necessary artistic talent. Embroidery patterns, which can be obtained for a few pence from any wool or needlework shop, may be extensively employed for this form of work.

In choosing your pattern or motif some thought must, of course, be given to the size, shape and subsequent use for which your article is intended. As a general rule garlands, sprays of flowers and similar floral designs may be freely adapted for hand-painted work. Choose small patterns or motifs for small articles, and larger designs for items like tablecloths and bedspreads.

There is no need for the ambitious craftworker to confine himself exclusively to painting floral designs, however. Animals, figures, scenes from pantomime, carnival and the hunt, historical characters, galleons and similar naval scenes will all be drawn upon by the craftworker who likes to make his work look original.

Applying the Colours

Your first task will be to transfer your design to the fabric upon which you propose to paint. If you are working from an embroidery transfer this part of the job is greatly simplified. The transfer must be pinned to the material, face-side downwards, and then a warm iron passed over the back of the paper. If the embroidery sheet is first dampened with a sponge the transfer of the printed design is usually more complete.

If you intend to work from an original pattern which you have already drawn out on paper you may either transfer your original direct through a sheet of carbon paper, or take a carbon copy on to another sheet of paper and then transfer this copy in exactly the same manner as that employed for an ordinary embroidery transfer—i.e. iron the sheet of paper from the reverse side.

When the outline of your design has been imparted to the fabric, place two or three thicknesses of newspaper over your drawing-board and pin the fabric into position, stretching it tautly to

ensure its perfect freedom from creases.

You must now decide whether you intend to outline the design in relief, filling the areas enclosed by these outlines with an application of flat colour, or employ solely a relief or a flat surface to your painted decoration.

For the relief painting of textiles one manufacturer supplies a range of colours in small tubes, with conical attachments for screwing on to the tubes so that the colour may be ejected in a thin, continuous strip. This form of work is extremely fascinating—although, perhaps, one needs to have had more experience in decorating a cake with icing-sugar than in the normal application of paint with a brush!

CUT ALONG PAINTED EDGE WITH SCISSORS



Fig. 1—A pleasing effect with edging work

Besides the conical metal attachments, the same manufacturer supplies special paper cones. These are filled with colour, the tips are snipped off and then the wide mouth of the cone is folded over and pressure is applied to the top of the cone with forefinger and thumb.

Outlining and Bodywork

As well as outlining your design with this relief method of decoration, it is also possible to fill in any given area by laying one line of colour down beside the next until the material is covered. The result of employing your colours in this fashion will be to produce a pleasing embroidery effect in a fraction of the time that the actual embroidery itself would have taken.

The colours may also be brushed on to the fabric to produce a flat or graduated surface. The introduction of the metallic powders and glass 'beads', mentioned earlier in this article, offers a good deal of scope for further embellishment of your painted fabric.

The dusting on of any powders or 'beads' should be done while the paint still retains its full adhesive powers—i.e. within ten or fifteen minutes of actually applying the colour itself to the fabric. However, if dusting is attempted too soon some of the heavier of these dusting media may sink too deeply into the colour. Some experimenting with paint and 'beads', etc., on a small scrap of waste fabric is advisable for the beginner.

A particularly pleasing effect can be obtained by arranging for your motif to overhang the edge of your article (see Fig. 1) and by trimming the fabric close to the painted outline an attractively natural arrangement is achieved. (166)



Bird Collections on Stamps

QUITE a number of people go in for thematic collections now-a-days. That is to say they choose a theme or subject and only collect stamps the design of which illustrates a point of their theme. Some of these subjects are extremely interesting, not only to the owner of the collection, but also to those who know nothing about stamps.

Many people, for the sake of good manners, appear to be interested in a collection, even if they wish they could shut the book and put it down. But if the stamps illustrate something in addition to philately, then they can genuinely take an interest. A thematic collection gives the collector a tremendous amount of scope for study and displaying art.

The writer once saw a collection of stamps illustrating birds and the album was decorated with sketches showing the nests, the eggs and the young of the bird portrayed on the stamp. It was a most effective collection and the notes which went with the sketches showed the care the collector had exercised.

There are quite a number of well known birds—such as the Sooty Tern, which appears on the 1/- stamp of the 1934 issue from Ascension. Terns are like gulls, though a little smaller. They have graceful flight, and although they have webbed feet they seldom swim. The range is more extensive than that of any other bird, so that it might just as well appear on a stamp from the northern hemisphere as on the one from Ascension.

We do not find many gulls as the central theme of a stamp, but they are to be seen on the frame of the St. Pierre et Miquelon stamp of 1932 which has a fishing trawler in the centre. We show this stamp here especially to illustrate the point about finding interest in the framework of a stamp. You need to use quite a lot of care and a magnifying glass if you want to get all there



The Black Swan

is to be seen.

Another type of fishing bird which can be seen on a stamp is a Booby. This is found on the Cayman Islands stamps—the penny and the two shilling values of the 1935 issue. They do not appear on the King George VI issues.

As the name suggests they are rather foolish birds. Not only will they allow themselves to be pushed off their nests and to have their tails pulled out, but they will sometimes alight upon a ship at sea and make no effort to avoid capture by the crew.

Another bird which when on land appears to be very quiet and tame, but when on the wing is far from this, is the frigate bird. It can be seen on the stamps of the Gilbert and Ellice Islands, the halfpenny value of the 1939 issue. Although it feeds almost entirely on fish it hardly ever descends to the water for its food. It chases the gulls and forces them to give up the food which they have caught. If the gull objects to doing this, then the frigate bird catches the gull by the tail and shakes it until it drops the food.

Black Swans

For the larger water birds we turn to the stamps of Western Australia. This part of the island continent first issued stamps in the year, 1854. The main part



Gulls of St. Pierre

The Booby that fishes

A Black-necked Swan

of the design then was a black swan and this has remained the chief part ever since. In fact, every stamp with the exception of the higher values has had a black swan on it.

In the early days of the discovery of Australia black swans were quite common, but now they are comparatively rare. Luckily they breed in captivity so they should not disappear altogether.

If you have not got a specimen of the stamps of Western Australia then you can still see a black swan on the Australian stamp of 1929. This was issued in connection with the centenary of Western Australia, as the latter had ceased to issue stamps of her own from 1912.

Not only is the black swan kept in captivity but so is the black-necked swan and this you can see on the one penny and twopenny values of the Falkland Islands of the 1938 issue. Like the white or common mute swan the black-necked bird carries its young on its back. But as the cygnets cannot climb out of the water on to the mother's back without help, she holds one leg in a backward direction. This forms a landing stage upon which the young climb and so make their way on to the back!

You need be careful about these stamps from the Falkland Islands, for the colour makes a great difference to the value. The one penny stamp of the design shown, if it has a black centre with a carmine frame, is catalogued at

£1; if black and scarlet, then the value is 5/-! But there is another design for a penny stamp which shows the Battle Memorial and is only worth 2d.

Larger Birds

The same country and set give us some more big birds. There is the Upland Goose on the fourpenny stamp, the Turkey Vulture on the 1/3 and the Penguin on the 2/6. As we are mainly dealing with water birds this time, and will deal with the others later, we shall not say anything about the turkey vulture yet.

The upland goose is unusual in one respect. That is that most geese show no difference in colouring between the sexes, but in this case there is; the males are almost entirely white and the females are soberly clad in chestnut and greyish

brown, with flanks barred with black.

The appearance of the King Penguin is known to nearly everyone, especially those who followed the adventures of Pip, Squeak, and Wilfred. Although the appearance may be well known, it is doubtful if the nesting habits are known by so many. No nest is made and when the one egg is laid it is carried on the top of the feet and covered by a fold of the skin which is so loose that it will fold over and protect the egg from the intense cold.

As soon as the young chick hatches that too has to be protected from the cold. Unfortunately a great number of them die from cold and when this happens, the parents then try to steal a chick from a more fortunate pair. Unfortunately in the struggle which ensues, the life of the prize is also often lost. The mortality among these birds is something like seventy per cent.

One of the most curious birds that we see in the stamp album is the Flamingo. We can see them on the eightpenny value of either the 1935 or the 1938 issue from the Bahamas. The former is a nice stamp, priced at 12/6, while the latter, although of the same design (except for the changed King's head), is only 11d.

That completes a very good collection of water birds, and it would make a most interesting exhibit. Next time we shall deal with some of the land birds and give some of the items of interest about them.

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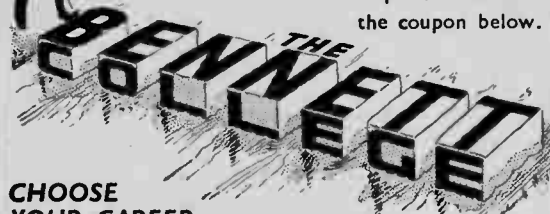
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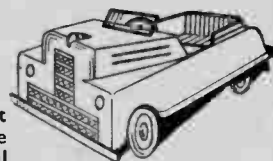
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Vol. 110 No. 2854

How the home handyman can BUILD A GARAGE

THE garage described in this series of articles is 14ft. long by 7ft. 9ins. wide. This is a popular size, being large enough to accommodate many of the 8 h.p. and 10 h.p. cars and even some 12 h.p. cars. The plan for making has been simplified, eliminating all unnecessary work without sacrificing strength and durability. Most of the framework is made of 2in. by 2in.

scantling and details are given in the cutting list of the lengths required for each section. If the instructions are followed carefully, a good professional looking job will be the result.

Making the Front Section

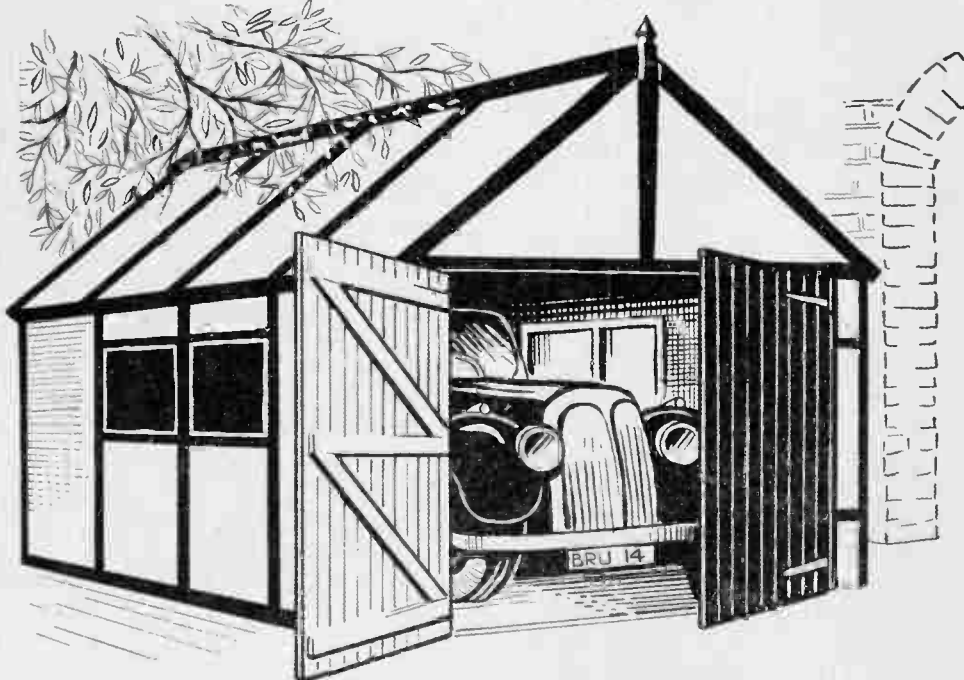
Fig. 1 shows the positions of the pieces which form the front section. First cut the four (A) pieces, these are 5ft. 10ins. long, and then cut the two

(B) pieces, 7ft. 9ins. long. Cut the eight 3½in. pieces (E) from the bits left over. It is important that the ends are cut perfectly square, otherwise the frame will be out of shape when assembled. This point applies right through these instructions.

In the cutting list the two pieces (D) are given as 5ft.; this is to give sufficient material for cutting the angles correctly. Mark out and cut as shown in Fig. 2.

The same lengths are used for the rear section and the intermediate roof supports, ten pieces in all, the centre pair being made of 3ins. by 2ins. It is advisable to cut all these pieces at this stage, making the length and angles exactly the same. This will ensure a good straight roof. The piece (C) for the front section is shown as 3ft. in the cutting list. Mark out and cut as shown in Fig. 3.

To assemble the front section, take up the two pieces (B) and drill the ends to take the nails. This simple precaution should be carried out whenever nails are driven across the grain at the end of a length. Split ends must be avoided at all costs. Nail in position the four pieces (A), using two 4in. nails at each end. The pieces (E) should be placed in



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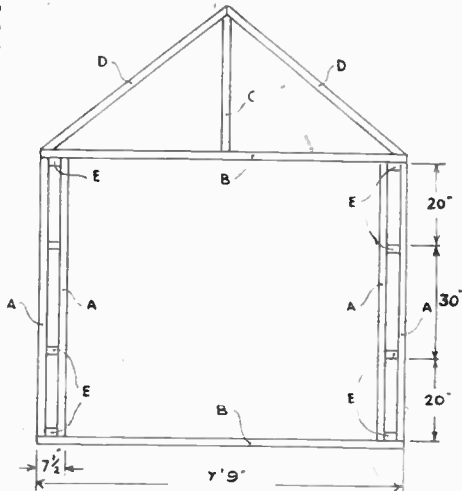


Fig. 1—Framework of front section

Illustration of various stages of the work

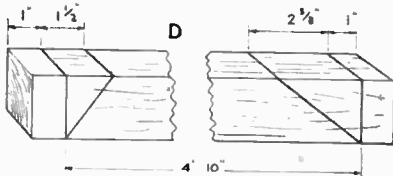


Fig. 2—Angle piece front section cutting two pieces

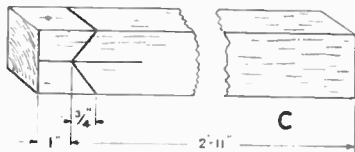


Fig. 3—Front section end shape

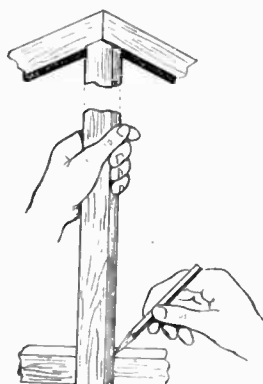


Fig. 4—Fitting centre upright to exact length

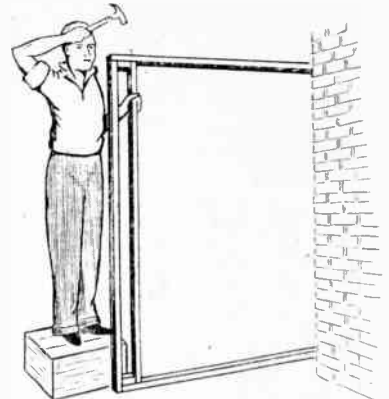


Fig. 5—Second stage with 3½ in. spacing pieces being nailed in

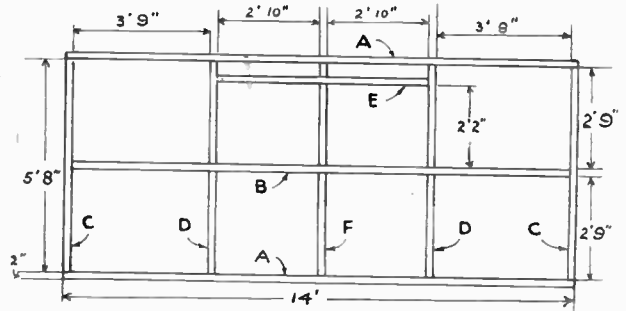


Fig. 7—Position of pieces forming side section

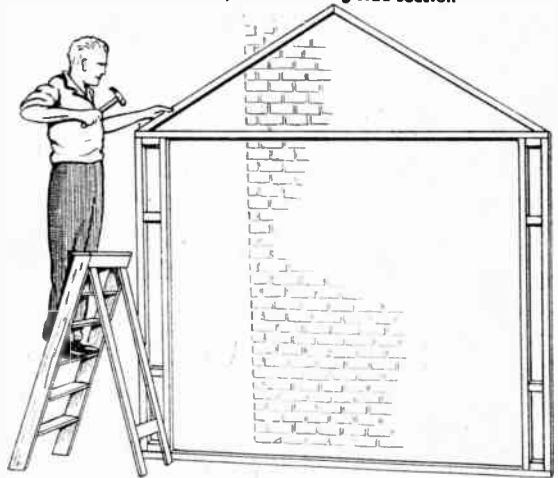


Fig. 6—Nailing in 4ft. 10in. angle pieces to front

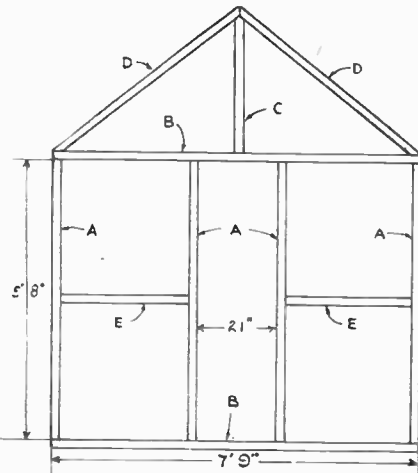


Fig. 9—Parts forming the rear frame

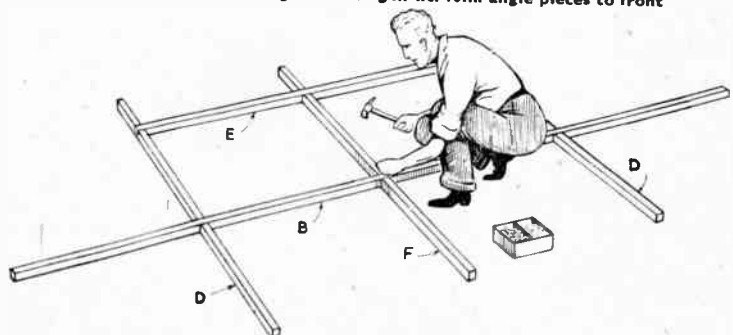


Fig. 8—The sub-assembly of the side section fixing

position while the inner (A) pieces are fixed.

Nail the eight 3½ in. pieces in position. Drill the two pieces (D) to take 3 in. nails, two at each end, and fit in position on the frame. Finally fit the centre piece (C). This should first be held in position and marked out as shown in Fig. 4. The front frame is now complete ready for the asbestos, the fitting of which is described later.

Making the Side Sections

The two side sections are identical. The position of the pieces are shown in Fig. 7. Half joints are used where the scantlings cross inside the frame. These are simple to make and need no explanation. Measure each piece very carefully, and cut to length. The five pieces (D) two off, (B), (E) and (F), should be marked out for the half joints, using a marking gauge and square. Finally cut the two 14ft. lengths to size and drill each end for the nails.

Prepare both side sections for assembling, then continue as follows. First nail the two 5ft. 8ins. (C) to the two 14ft. pieces to form a rectangular frame. Check this for being square against a sheet of asbestos. Now assemble the two pieces (D) and the piece (F) to the piece (E) and secure each half joint with one 2½ in. nail, see Fig. 8. Place the 13ft. 8in. piece (B) in position and secure in a similar manner. Take up this sub-assembly and place it in the rectangular frame.

Before nailing in position, ensure that the ends of (B) come in the centre of the two uprights (C), and that the other pieces are parallel, also that the top of the two (D) pieces are touching the ends of (E). Nail the sub-assembly in position, using two 4in. nails at each end. Finally add a second 2½ in. nail to the half joints, firmly clenching these over. The side sections are then ready for the asbestos.

Making the Rear Section

The position of the pieces forming the rear section are shown in Fig. 9. The two (D) pieces are identical to those on the front section and if the previous instructions have been followed they will be ready cut. The (C) piece is also the same and should be marked out and cut as shown in Fig. 4. Ensure that the other pieces are right for length and that the ends are square. The rear section is then ready for assembling.

Drill both ends of the two (B) pieces to take the nails, then nail them to the two (A) pieces to form a rectangular frame. Check this for being square, then mark the positions for the two (A) pieces on the top and bottom rails (B) to form the space for the rear door. Mark a line across the exact centre of the four uprights (A), and nail an (E) piece to each of the two inner (A) pieces, see Fig. 10.

Nail these into the rectangular frame as shown in Fig. 11, making sure that the door space is correct and parallel. Fit the two angle pieces (D) and the (C) piece in the same way as was done with the front section. The rear section is then ready for the asbestos.

The roof is divided into four sections, each section being made of 2ins. by 1½ ins. scantling, as shown in Fig. 12. Half joints are used throughout these sections. Three 2in. nails are used at each corner and joint, these being clenched over. When the roof sections are completed, the entire framework is ready for covering.

The most popular sizes in asbestos are

to drive nails straight through the asbestos without first drilling, but this should not be done as there is always the danger of cracking the sheeting.

It is best to cover the side sections first, these being the most straightforward job. Lay a side frame on the floor and place in position two 6ft. by 4ft. sheets, one at each end of the frame. Position them to extend just half way

TIMBER IN GROUPS

	Size	Length	No. of lengths
One side section (two groups required)			
Scantlings	2ins. by 2ins.	14ft.	3
Scantlings	2ins. by 2ins.	6ft.	6
Front section			
Scantlings	2ins. by 2ins.	8ft.	2
Scantlings	2ins. by 2ins.	6ft.	4
Scantlings	2ins. by 2ins.	5ft.	2
Scantlings	2ins. by 2ins.	3ft.	1
Rear section			
Scantlings	2ins. by 2ins.	8ft.	2
Scantlings	2ins. by 2ins.	6ft.	4
Scantlings	2ins. by 2ins.	5ft.	2
Scantlings	2ins. by 2ins.	3ft.	3
One roof section (four groups required)			
Scantlings	2ins. by 1½ ins.	7ft.	2
Scantlings	2ins. by 1½ ins.	5ft.	3
Roof supports			
Scantlings	2ins. by 2ins.	7ft.	3
Scantlings	2ins. by 2ins.	5ft.	4
Scantlings	3ins. by 2ins.	5ft.	2
One window frame (four groups required)			
Planed	2ins. by 1½ ins.	3ft.	2
Planed	2ins. by 1½ ins.	2ft. 6ins.	2
One front door (two groups required)			
Planed	4ins. by 1in.	6ft.	5
Matching	5ins. by ½ in.	6ft.	8
Matching	5ins. by ½ in.	6ft.	1
(One 6ft. length for the overlap)			
Rear door			
Planed	4ins. by 1in.	2ft.	3
Matching	5ins. by ½ in.	6ft.	5
Weather boards and strips			
Planed	5ins. by ½ in.	5ft. 6ins.	6
Planed	5ins. by ½ in.	5ft.	2
Planed	4ins. by ½ in.	13ft. 6ins.	2
Planed	2ins. by ½ in.	8ft.	2
Planed	2ins. by ½ in.	6ft.	24
Planed	2ins. by ½ in.	3ft.	2
Planed	2ins. by ½ in.	6ins.	2
Ornaments, planed	4ins. by 1in.	1ft. 6ins.	2

ASBESTOS

(All ½ in. thick)

9 sheets at 6ft. by 4ft.

8 sheets at 6ft. by 3ft.

SUNDRIES

6, 15in. 'T' hinges.
4 sheets of glass, cut to fit frames (approximately 2ft. 7ins. by 1ft. 11ins.).
16 metal clips for roof.
28ft. of 3in. guttering.
10 gutter support brackets.
4lb. of paint. For doors, window frames, and weather boards.
Window fittings.
3 door bolts, one padlock and hasp.

2lbs. to 3lbs. of 4in. round nails. For 2in. by 2in. scantling.
1lb. of 3in. oval nails. For roof supports.
1lb. of 1½ in. oval nails. For nailing on matchings.
2lbs. of galvanised nails (1½ ins.). For nailing on asbestos.
36, 3in. screws. For 4in. by 1in. roof boards, and supports.
36, 1½ in. screws. For fixing ledges.

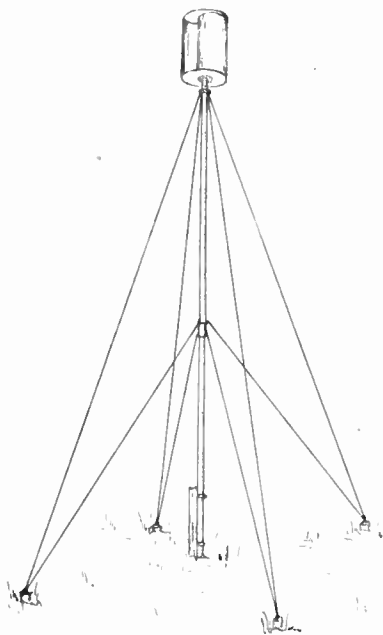
6ft. by 4ft. and 6ft. by 3ft. With this in mind, the framework has been designed to meet these sizes. The necessity for cutting some of the sheets is unavoidable, but this need not offer any great difficulty if the instructions are carefully followed. The best tool for cutting the asbestos, is an old rip saw.

Although the expert can cut asbestos by nicking it with a file, this method is not to be recommended when the stock of asbestos is limited. Also it is possible

across the two (D) pieces. Next, place in position a 6ft. by 3ft. piece with its upper edge extending half way across the middle rail.

With the three pieces in correct position, mark off and drill for the nails. Round the outside of the frame, the holes should be drilled 1in. from the edge of the asbestos, but where the sheets meet, and under the windows, the holes should be drilled ½ in. from the edge. (To be continued.)

A scientific principle of aero-dynamics in this NOVEL WINDMILL



WINDMILLS are always a source of great attraction, and so long as there is any wind left to drive them there will be many new designs appearing. Ever since windmills were first introduced into this country some 800 years ago, there have been an almost endless number of different types made.

The most popular kinds that we are so familiar with in the countryside have four large arms and were mostly used for grinding corn. In many other countries such as Holland and Scandinavia windmills of this kind are used to pump water for draining the land.

Arm Results

Experiments were carried out with mills having five and six arms, but were not very satisfactory and there was no gain in power as there must be a certain amount of space left between the arms for the wind to get away freely after doing its job. Indeed, one of the most satisfactory types in use today is simply a single aeroplane type propeller.

MODEL ENGINEER EXHIBITION

Readers in and around London should make a point of visiting the always-popular Model Engineer Exhibition to be held at the Horticultural Hall, Westminster from Aug. 9th to 19th. The very latest in model making practice will be on view, many of the stands demonstrating model making in a very wide range of subjects.

Besides being used for grinding corn and pumping water, windmills are very useful as a cheap motive power for quite a variety of purposes. One of the best uses is, undoubtedly, for driving a dynamo for the production of electricity for the workshop or home.

It is possible to make a very effective bird scarer worked from a small windmill and this should be a boon to the keen gardener.

The rather novel design of windmill described on this page, if built carefully is capable of doing some very useful work. The sizes given are for a small model, but these can be made much larger if needed to do the work of pumping water or generating electricity. A close-up of the head is seen in Fig. 1.

For an Open Space

There is nothing difficult about building this windmill and provided you have a nice open space in which to erect it, some very good results should be obtained.

The principal upon which it works can be seen by referring to Fig. 2. The windmill rotates on the axis (A), while (B) and (C) are two half cylinders. When the wind (shown by the arrow) blows into the cylinder (B) it causes the mechanism to rotate on the axis (A).

At the same time some of the wind is reflected off (B) and thrown against (C) which thus helps to increase the speed of rotation. The cylinder (C) acts as a streamlined surface until the windmill makes a half turn, when this is then in a position to receive the force of the wind and carry on the good work.

From a Cocoa Tin

The model described here is made from a one pound cocoa tin which is 3½ ins. diameter and 6 ins. high. This size need not be adhered to—any other size within reason can be used. It is suggested that the windmill should not be made any smaller, however, as even the size given is only for a model. If the windmill is required to do a useful job of work it must be made considerably larger.

Cut off the bottom of the tin and also cut down either side of the seam—a pair of metal shears or an old pair of scissors will do this. The rough edges should be filed smooth and during this operation be careful not to alter the curves of the two half circles. By saving the

lid this can be used as a template.

Two circular pieces of tin are used to keep the half circles in position. Reference to Fig. 2 will show that these plates are 5½ ins. diameter and they can be made from old tins flattened out. By means of the lid template carefully mark out the positions for the half circle vanes.

Ball Bearing

Before proceeding further with the fixing of the vanes, the bottom plate must be fitted to some sort of mechanism to enable it to revolve freely. There are many ways in which this may be done but probably the easiest as well as being the best, is a ball bearing hub from an old cycle. Drill a hole in the centre of the plate large enough to take the nut and screw end of the hub and also 3 or 4 small holes corresponding with the spoke holes. Small nuts and bolts will then securely fix the plate to the hub, but make quite sure that the nuts are tight. A hub is shown in Fig. 3.

We are now ready to fix the wind vanes on to the end plates. Place the half circles carefully on the lines already marked on the end plates and run plenty of solder in to make a wind tight joint.

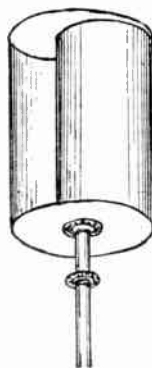


Fig. 1—The tin head

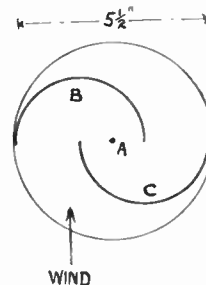


Fig. 2—Principle of rotation

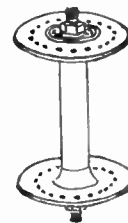


Fig. 3—Ball bearing hub

There is no need to mention the fact that a windmill should be erected as high as it is possible to get it in order to catch the full force of the wind. It must be left to your discretion to fix your mill in the best position. On the bottom end of the cycle hub is a good thread which can be screwed into a length of gas pipe or fastened on to a piece of angle iron.

If the windmill is going up fairly high be sure to have sufficient guy wires, especially if you have made a larger model. Before the final erecting, it would be advisable to give all metal-work a coat or two of protective paint.

It would be a good idea to make a small size model first to find out exactly how it works, and then if you decide to build one to supply electricity or to pump water, you can design a much larger mechanism. (167)

For the armchair smoker you should make this ASH TRAY HOLDER

THE stand ash tray holder illustrated is the sort of simple piece of woodwork which the average handyman at home can undertake for his own comfort, or as a gift to a man who is a smoker. The actual article need not be followed exactly for style, but it certainly offers a suggestion for other readers who may have any particular bits and pieces to choose from and to build into their own particular style.

The main thing is that the height should be convenient to anyone sitting in a low easy chair, and the length of the main pillar, therefore, really rules the overall height. The one shown here was cut from an odd tapering table leg, whilst the circular curved base and the inverted holder at the top were two odd parts of bedside table lamps which had found their way into the junk box.

The Column

The column between them could, of course, be of other shape than the tapered square shown. You may have one of the Jacobean candlesticks sufficiently long to provide the column you want, or you may have a piece of curved chair leg or similar article which may serve the purpose.

If possible, all the material should be the same character, and oak will be preferable as being more solid-looking and dignified in use. On the other hand, there is no need to throw up the job because the timber is not all alike, because you can stain it very dark, or even paint it a bright colourful hue.

The other point you have to note before commencing is of the ash tray to be used in conjunction with it. This

objection to this, but, of course, the upper base should be roughly in proportion and in keeping with the lower one.

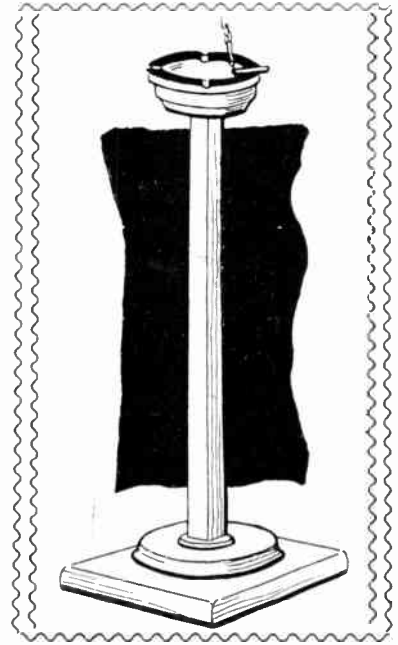
Now for the general details. The tapered centre column is 16ins. high with the overall height 20ins. Check this up for your own requirements to see it is useful for your own chair. The lower base is a plain piece of $\frac{3}{4}$ in. oak 6 $\frac{1}{2}$ ins. square, and the turned base on the top of it is a 5in. diameter circle of wood which formerly provided a table lamp base.

A Wheel Base

If you are unable to obtain this, then possibly a turned wooden wheel such as used on toys could be brought into use. The central hole will serve to take a stop spindle cut on the end of the central pillar.

The tapered pillar shown is $\frac{1}{2}$ in. square at its bottom end, and the projecting spindle piece top and bottom should be $\frac{3}{4}$ in. long to provide strength. If your circular base is not as thick as this, then the spindle portion should be less, but it should certainly pass through that part. This spindle portion should be left fairly large in diameter, as seen at Fig. 1, with the square bottom of the pillar providing the shoulder. Get a tight fit and ensure that the pillar stands upright.

The base in itself is not sufficiently heavy, so that a weight of some kind must be introduced. In the one shown, a flat slot was cut large enough to



Having obtained the particular ash tray to be used, you will then have to work out the method of holding it in place. A shaped circular top should, in any case, be added to the top of the column, and here again, the wooden toy wheel or the vase of an electric bedside lamp can be used. If a base is incorporated, it should be inverted to have the larger surface uppermost. Then a circular rim of thinner wood can be added to provide a recess for the actual tray.

Metal Ash Tray

If it is one of the normal ones with indentations for cigarettes, the rim will have to be cut or grooved to allow this sinking. It will also help to hold the end in place. The rim holding the tray in place need only be $\frac{1}{4}$ in. or $\frac{3}{8}$ in. in thickness, but should project beyond the under circle of wood also by $\frac{1}{4}$ in. or $\frac{3}{8}$ in.

The centre of this top tray rest should, of course, accommodate also the rounded spindle of the top of the pillar in the same way as shown in Fig. 1 for the bottom. If there is not a hole already bored in the main part, then you may either take one out with a brace and bit, or leave it as a square opening for a normal mortised and tenon joint.

Take some care in measuring out this top portion, and that its rims ensure the ash tray lying snugly into its bed. Finally glue the parts together rigidly and clean them thoroughly with glass-paper.

The completed stand is afterwards stained according to taste, or if a variety of wood has been used, it can be coloured with enamel after a first priming coat has been added.

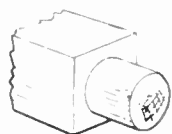


Fig. 1—Pillar top and bottom dowel joint

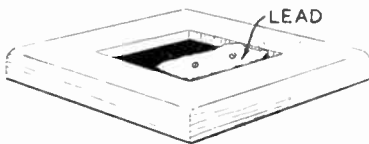


Fig. 2—The base recess with weight

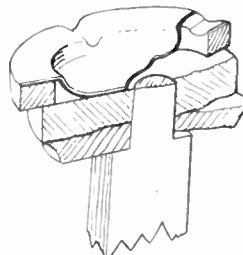


Fig. 3—Cut-away view of top

should not stand loosely on the top platform, but should be made to fit into it to prevent sliding off and yet to be removable when the ashes have to be emptied. The actual base should be large enough to form a wide surface and even so, it is as well to introduce a weight of some kind to maintain an upright position when in use.

Alternative Shapes

If we give some details of the actual one shown, the measurements will serve as a useful guide, although as previously mentioned, they need not be followed exactly. You may prefer to have an all-circular base, for instance, or the part you have in mind and available may even be octagonal or hexagonal. There is no

accommodate some odd slabs of lead, one of which is shown in Fig. 2. These odd pieces of lead can be obtained from a builder's yard or ironmonger for a few pence, and should be made to fit quite tightly into the aperture, or can be screwed down. It must, of course, be flush with the top of the wood so that when the circular base is fitted on, the two parts get snugly together.

Stain each piece separately, then glue on the circular one after marking its position in pencil. To prevent any likelihood of warping, a couple of screws can be added on the inside with their heads countersunk so as not to scrape any surface. The column can now be glued in, being made rigid, firm and upright.

History, Geography, Humour can be found in COLLECTING INN NAMES

THE great increase in road travel during the past few years has given us another 'collecting' hobby—names of inns and taverns. Enthusiasts do not merely collect the names, but delve into the meaning and origin of the various signs they encounter.

At first sight, the names and designs of many pictorial signs seem ridiculous to a degree, but a little investigation very

panies have been 'adopted' in similar fashion. *Adam and Eve* illustrates the Arms of the Fruiterers' Company, *Elephant and Castle* the crest of the Cutlers' Company. The various versions of *The Ram* were most probably inspired by the Arms of the Clothworkers' and Drapers' Companies, whilst the *Three Tuns* portray the Arms of the Ancient Company of Vintners.

The *Green Man* is a sign common in parts of the country, but many innkeepers in the past have caused the sign to be erroneously painted. Actually, the symbol of a Green Man is of great antiquity and found among the armorials of old families. With the passing of centuries many liberties have been taken with the genuine symbol and thus the *Green Man* may depict Robin Hood or old-time gamekeepers!

Commemorating Disputes

Near Tetbury, in Gloucester, you may chance upon an inn with a strange name indeed—*Trouble House*. It refers to the fact that the inn was the scene of angry disputes by local landworkers over the introduction of agricultural machinery and many heated debates took place within its walls.

That the sign of *The Bell* is so numerous is due to the fact that a bell was the coveted trophy presented at York races in the early seventeenth century. Nevertheless, some inns of this name existed long before this, for Chaucer (14th century) makes mention of a *Bell Inn* at Southwark. Some inn sign experts express the view that the title was devised as a subtle invitation to win the patronage of early bellringers!

The *Flower Pot* is fairly common in some parts and is believed to have been derived from the lily vase shown beside the Angel Gabriel in medieval pictures of the Salutation of the Blessed Virgin.

The Hole in the Wall is a sign which puzzles many people. The general belief is that it refers to the hole in the wall of old-time debtors' prisons, through which friends of an imprisoned person could pass into the cell food and other comforts.

Almost every country has its quota of

White Harts. This symbol is of classic origin and has been popular as far back as the days of Alexander the Great, who died in the year 323 B.C. The *White Hart* at Southwark was said by Shakespeare to be the headquarters of the notorious Jack Cade, (A.D. 1450).

The numerous *Lions, Bulls, Feathers, Griffins, etc.*, mostly have their origins in heraldry, and many are combinations and adaptations.

The *Crooked Billet* is often a puzzling sign. The word 'billet' means a log of wood. This symbol was used by the proprietors of early alehouses for they hung a log of wood over their doors to indicate the nature of their business.

Cross Keys is a very well-known sign and represents the emblem of St. Peter. Keys are incorporated in many ecclesiastical arms including those of the sees of Ripon, Gloucester and Exeter, so it is easy to understand the wide use of this symbol. *The Case is Altered* (of which there seems to be only three examples) is a real poser. At least one of the three examples shows a rider on horseback and the sign refers to a mounted messenger who brought to London news of a favourable change in our fortunes during the Battle of Waterloo.

Modern Examples

By way of contrast to these signs of ancient origin we occasionally find some modern examples. For instance, there is at least one *Gasometer* (in Northamptonshire), a *Come Inn*, a *Welcome Inn* and a *Listening Inn*. There is one at Hastings which commemorates the hectic days of the G.I.

Ancient inns and their curious signs make a very interesting study for it brings to light events in history, old customs, and old trades. Unfortunately, many of our oldest inn sign boards, often works of art, have passed into the hands of private collectors, particularly Americans.

On the other hand, the brewing companies of today are showing great interest in the topic and many ancient signs have been most carefully copied or restored by first-class artists. (180)



A striking topical sign



At the sign of 'The Five Alls'

often brings to light some extremely interesting explanations.

The inn sign is a relic of the days when the majority of people were unable to read and the trader had to resort to various signs and symbols to call attention to the nature of his business. The gaudily painted striped pole for example, still to be seen outside barbers' establishments, originally informed the illiterate that the proprietor was a surgeon as well as a barber—the stripes on the pole representing a bandaged limb.

The origin of many signs, of course, is readily understood. The *Lord Nelson, Palmerston, Duke of Wellington*, for instance, were obviously inspired by events and personalities of the day. The various types of 'Arms' are also easy to trace, and refer to the armorial bearings of the local ground landlords. The two interesting pictures are loaned by Bristol Brewery Georges' and Co.

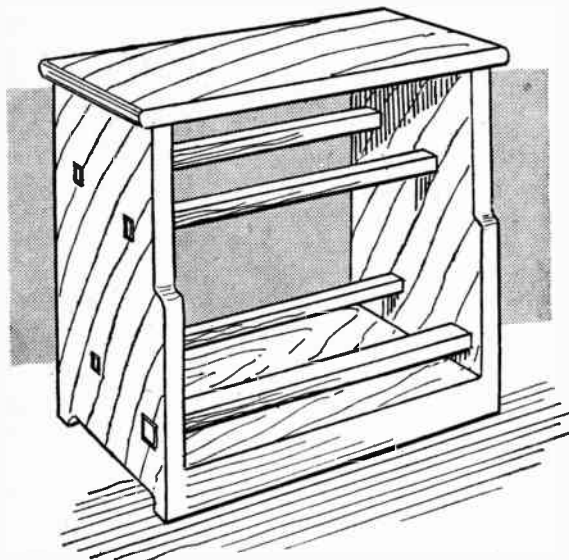
Unknown Origins

A great many signs, however, have meanings far from obvious. Why *Goat and Compasses*? This is a fairly common sign and one with several variations such as *Three Compasses, Goat's Head*, and so on. They refer to the arms of the Ancient Company of Carpenters and the Company of Cordwainers (shoe-makers). It is thought that landlords of early times hoped they would flatter workers in these trades and so encourage their custom by featuring the Arms!

The Arms of many other City Com-

**Be sure to read our
Advertisement pages
They are always very
full of interest**

If you want a sensible piece of carpentry build A SHOE STAND



TO keep spare shoes tidy a rack is very necessary. A substantial design of rack is illustrated, capable of accommodating 2 pairs of men's shoes, and 3 pairs of ladies'. Where additional accommodation is needed, the length of the rack can be increased proportionately for the purpose.

Wood $\frac{1}{2}$ in. thick is suggested for making, and if shelving board can be obtained, which is usually of that thickness, and up to 11ins. wide, the ends of the rack can be cut in one piece and no gluing together becomes necessary. Thicker wood can be used, but the result tends to look rather too heavy and clumsy.

The two ends of the rack can be set out from the drawing in Fig. 1. The mortises for the rails which support the shoes, are $\frac{1}{2}$ in. wide, except the bottom right-hand one, which is 1in. These can

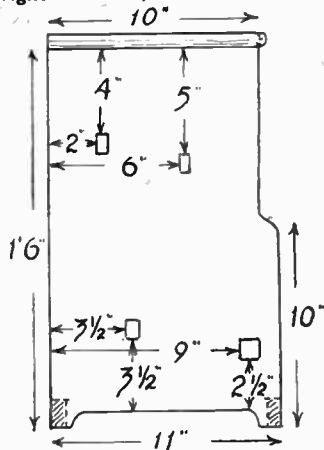


Fig. 1—Side view with dimensions

be chiselled out in the usual way, but some saving of time is effected if the majority of the wood is removed with a $\frac{1}{2}$ in. centre bit, leaving only the corners for the chisel to cut. Leave clean cut edges to the mortises for a general neat effect. At the bottom, cut away a 1in. wide strip for most of the width, to lighten the appearance.

A front view of the rack is shown at Fig. 2, the shoe rails being broken across to show their separate position in the rack. Cut these rails from the $\frac{1}{2}$ in. board, three of them being 1in. across, and the bottom front one, 2ins. across. Cut them 1ft. 7 $\frac{1}{2}$ ins. long, and cut away the ends for a distance of $\frac{3}{4}$ in., as shown at (A) in Fig. 3, to leave $\frac{1}{2}$ in. tenons to fit the mortises except the broader bottom rail, which is trimmed to leave 1in. tenons.

Floor Rails

Two additional floor rails are required, 1 $\frac{1}{2}$ ins. wide and the full interior length of rack, i.e. 1ft. 6ins. These are to be nailed across at the bottom, one at the front and the other at the back. Their position is shown shaded in Fig. 1.

The top of the rack is cut to overhang sides and front by $\frac{1}{2}$ in., and is grooved $\frac{1}{2}$ in. deep underneath to receive the ends, as at (C). Owing to the frontal overlap, obviously these grooves must be stopped $\frac{1}{2}$ in. from the front edge. The making of a stopped groove is sometimes considered by the amateur as a touchy job. Actually, if performed in the right way, it is quite easy.

Mark the grooves out, then with a

mallet and chisel, cut away a recess about 1in. long and as deep as the proposed groove, at the stopped end. The tip of the saw can then enter this recess and the cutting of the groove proceed in the usual manner, with, perhaps, just a trifle more care.

Assembly

To fit the parts together, glue the rails to the ends, glue and nail the floor rails across and then fit the top on. The edges of the top should be slightly rounded off where they overhang the rack. A bottom of plywood or substitute board is glued across the floor

TIMBER LIST

Sides (2)— $\frac{1}{2}$ in. by 11ins. by 1ft. 6 ins.
Top— $\frac{1}{2}$ in. by 10ins. by 1ft. 8 $\frac{1}{2}$ ins.
Shoe rails (3)— $\frac{1}{2}$ in. by 1in. by 1ft. 7 $\frac{1}{2}$ ins.
Shoe rails (1)— $\frac{1}{2}$ in. by 2ins. by 1ft. 7 $\frac{1}{2}$ ins.
Floor rails (2)— $\frac{1}{2}$ in. by 1 $\frac{1}{2}$ ins. by 1ft. 6ins.
Plywood or substitute—11ins. by 1ft. 6ins.

rails, as at (B). A few small thin nails should be added here.

Finally, in the corner angles at the back of the rack, glue and screw stiffening blocks, as seen in the front view, Fig. 2, to brace up the structure.

The projecting ends of the rail tenons should be bevelled off, and then from looking rather unsightly, they will present a pleasing finish to the flat sides. The woodwork should be nicely cleaned over with glasspaper.

Finish

So far as a finish is concerned, if the rack is intended for bedroom use, it could be stained oak colour and varnished, or enamelled in any pleasing colour. For kitchen or scullery it could well be left plain, or be just varnished.

As shoes are usually cleaned and brushed in either kitchen or scullery, a useful addition to the rack can be added, if thought worth while. This is a box arrangement, as sketched in Fig. 4, for the accommodation of brushes and polish. If it is determined to add this, one of the ends of the rack is made 4ins. higher than the other, and the top is grooved into this end, as seen in the sketch.

At a distance of about 8ins. from this extended end piece, which, of course, forms one end of the box, a second end

(Continued foot of page 232)

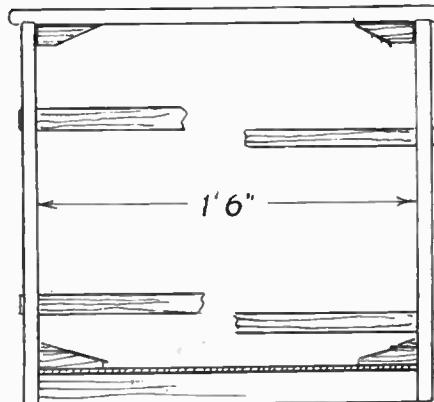


Fig. 2—Front view, with broken detail of rails

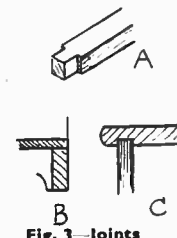


Fig. 3—Joints

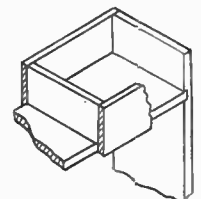


Fig. 4—The brush box

An excellent gift for a man is this novelty PARROT TIE RACK

THE tie rack indicated in Fig. 1, of the accompanying illustrations, is just the thing to make for a present, or you may feel inclined to make one for your own private use. The novelty of the rack may be said to rest with the parrot, and details are given in Fig. 2.

Commence on the parrot by selecting a piece of sound wood, size $9\frac{1}{2}$ ins. long by $5\frac{1}{2}$ ins. wide and $\frac{3}{8}$ in. thick. Divide the wood into $\frac{1}{2}$ in. squares and then copy the outline of the parrot. Drill two holes $\frac{3}{8}$ in. diameter to allow for the dowel rods to pass through, one hole being in the beak $1\frac{1}{8}$ ins. from the top and $\frac{3}{4}$ in. from the side, and the other through the foot $2\frac{1}{8}$ ins. from the centre of the top hole, and $2\frac{3}{4}$ ins. from the side, Fig. 2.

These holes should be accurately made in order to avoid trouble in fitting later on. Carefully cut the tenon 1 in. long and $\frac{3}{8}$ in. wide on the back of the parrot, as shown, then neatly cut the figure to shape.

In order to do the colouring of the parrot with ease, it is best done before it is fitted together. A nice effect is obtained by marking the lines shown in Fig. 2, with black enamel, then filling in the spaces with coloured enamel, as

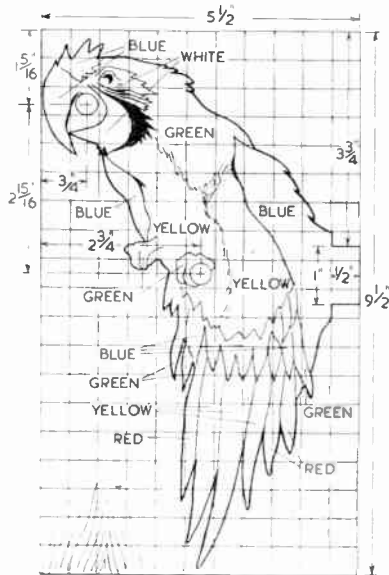


Fig. 2—Outline of figure with suggested colours

indicated. Each side of the parrot is coloured, and the edges are coloured to correspond with the colour on the sides.

Two end supports are required for the rack and details are given in Fig. 3. Cut the wood $5\frac{1}{2}$ ins. by $5\frac{1}{2}$ ins. and $\frac{3}{8}$ in. thick and divide into $\frac{1}{2}$ in. squares. On a centre line $1\frac{1}{8}$ ins. from the top and $\frac{3}{4}$ in. from the side, scribe a circle $\frac{3}{8}$ in. diameter for the dowel rod. With the same centre, scribe a circle $\frac{3}{4}$ in. radius as in Fig. 3. Carefully measure $2\frac{1}{8}$ ins. from the centre and a distance $2\frac{3}{4}$ ins. from the side, which will give the centre for the lower dowel rod.

On this centre scribe a circle $\frac{3}{8}$ in. diameter and also the arc $\frac{3}{4}$ in. radius, as indicated. Now draw the remaining outline of the brackets from details given, and cut the tenon 1 in. long by $\frac{3}{8}$ in. deep in the position given. Carefully drill the holes for the rods, then neatly cut out the shape of the brackets.

The base for the rack is indicated in

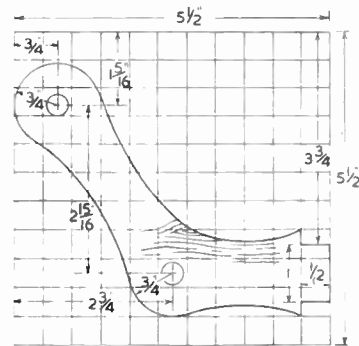


Fig. 3—Details of the end supports

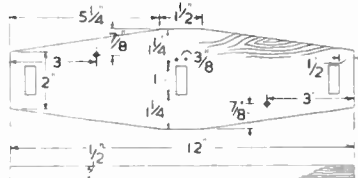


Fig. 4—Shape and mortises in back rail

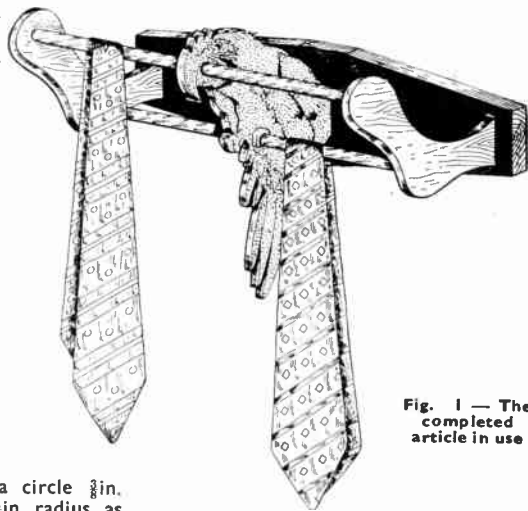


Fig. 1—The completed article in use

Fig. 4, and this is made in wood $\frac{1}{2}$ in. thick. First cut the wood 12 ins. long and $3\frac{1}{2}$ ins. wide. On a centre line through the wood, mark off and carefully cut the three mortise slots 1 in. long and $\frac{3}{8}$ in. wide. The two outer slots are cut in positions $\frac{1}{2}$ in. from the end as clearly shown. Take care when cutting the slots and make them a good fit on the tenons of the parrot and brackets.

Mark off two points a distance of 3 ins. from the ends and $\frac{3}{8}$ in. from the top, and bottom edges, as shown, and drill holes at these points to take a No. 10 or No. 8 wood screw for fixing. From a distance of $\frac{3}{8}$ in. on each side of the centre, taper the top and bottom edges of the base down to 2 ins. wide at the ends as clearly shown in Fig. 4.

Dowel Racks

Two pieces of $\frac{3}{8}$ in. dowel rod are required 11 ins. long, and the items may then be fixed together. First see that the dowel rods are a loose fit in the holes made in the parrot. Slide the rods through the holes in the parrot, prepare the ends with glue and fix the brackets. Glue the tenons on the parrot and brackets, then fix into the base. The rack is neatly finished by giving the rods, brackets and base a coat of stain, and the article is ready for fixing in any desired position.

Shoe Stand—(Continued from page 231)

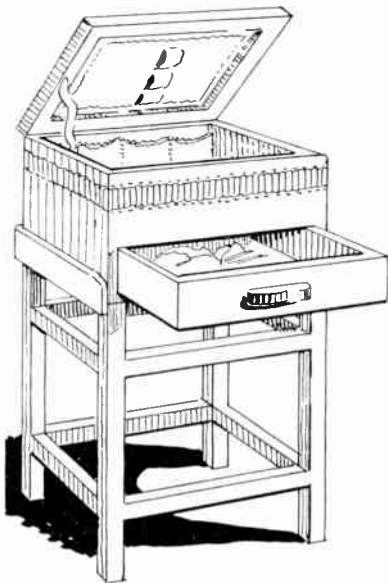
piece is nailed across, and the open sides covered in with pieces of slightly thinner wood to complete the box.

It is necessary to remember here that as $\frac{1}{8}$ in. of the short end is in the groove of the top, the height of this end must be increased accordingly. In other words, make the height 1 ft. $6\frac{1}{2}$ ins., then no miscalculation will ensue. Complete the

box addition with a lid, which can be hinged or just a 'lift off' one. A centre divisional piece might be added to keep black and brown brushes and polish separate. Many readers know, with painful recollection, what happens when brown shoes are accidentally polished with a brush previously devoted to the black ones.

Just one point to add. If the box addition is decided on, do not forget to reduce the width of the top just $\frac{1}{8}$ in. (the amount of the frontal overhang) for that part forming the base of the box. This will, of course, be apparent when making it up, but it is as well to mention it now in case it should be overlooked until gluing up starts.

Provide your wife or friend with this practical LADY'S WORKSTAND



THE modern-style needlework box, shown in the illustration, is strongly constructed of wood and covered with a good plain fabric or paper. The interior of the box should be lined with moire or silk, fitted with pockets for the back for silks, etc., and with loops on the underside of lid for scissors, needles, etc.

There is also a large drawer for reels of silks, thread and other smallish materials. The box must be strongly put together, as this type of box generally comes in for a fair amount of rough usage.

General Dimensions

The size of the box overall is 12½ ins. by 10½ ins. wide and 5½ ins. deep. Wood ½ in. thick is used throughout and the lock joint used at all corners, as shown in Fig. 1. If the worker should, on the other hand, decide to adopt the plain butt joint and nails, then he must strengthen the whole construction by gluing in the angles of the box and elsewhere, some angle fillets either quarter round or plain triangular angle fillet.

To make a satisfactory job of the lock joint suggested, needs careful measuring off and marking out. Take, for instance, the joint between the back of the box (B) and the two sides (A). With a 12 in. rule laid across the boards, mark off the seven divisions ¾ in. wide. Then set in a margin of ¼ in. The fretsaw will do the rest, care being taken to keep on the outside of the drawn lines when cutting.

The jointing up of the tongues will then fit stiffly together. See they go together accurately, then take apart and

brush the glue at all meeting surfaces. In marking out the joints between the side rails (A) and the front rail (C), divide the 3½ ins. width into six with a pair of compasses or dividers. Brush all the joints with the glue and knock the frame together, testing the angles inside afterwards with a set square.

The Floor

Now cut the floor (D) 12 ins. by 10 ins. and glue this to the frame, putting in a few fret pins to hold the piece flat while the glue is hardening. The upper floor (D1) is now added. This measures 11½ ins. by 9½ ins., dropped in to a depth of 3½ ins. from the top of the frame, as seen in Fig. 1. One or two flat screws or

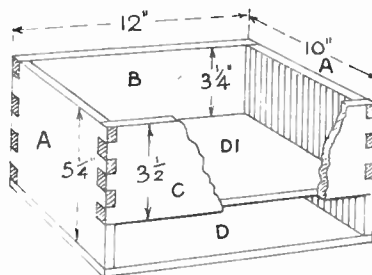


Fig. 1—The building of the box frame

a few fret pins may be driven through into the floor for further strength.

The Drawer

The drawer is simple in construction, as Fig. 2 shows. There is a shallow frame made from four rails 1½ ins. wide, the two side rails (F) measuring 9 ins. long and two rails (E) 11½ ins. long. All are lock-jointed at the angles, see Fig. 2. A floor piece will be glued to the frame, and the edges round afterwards glass-papered and made to fit neatly into its opening in the box. To the front rail (E) of the drawer is fixed an outer front (G), measuring 12 ins. by 2 ins. by ½ in.

In fixing on the front (G) see that its lowermost edge comes flush with the lower edge of the floor. The dotted line shows this in the large circled diagram in Fig. 2.

It remains to cover the box with the fabric as suggested. The first operation will be to first cover the whole box outside with a good stout brown paper.

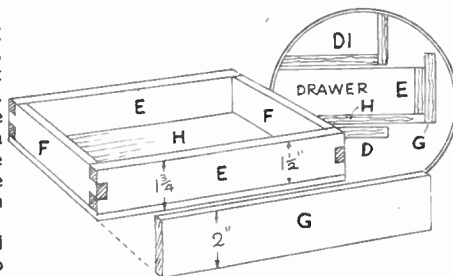


Fig. 2—Construction and detail of drawer

First glue some strips all round the top edge of the box wide enough to lap down ½ in. or so on the inside and the outside. Cover all four sides of the box with the paper, and when the glue has hardened, cut the paper neatly round the drawer opening with an old safety razor blade.

Coverings

The inside of the box, including the floor, should be covered with white paper or drawing cartridge paper. Bring up the inside paper to within about ½ in. of the top edge of the box. Now mark out and cut the covering fabric, allowing it to lap over the top ½ in. and round on to the floor of the box about ½ in.

Coat the outer sides of the box with thin hot glue and gently press the fabric in place on to it. Take care to preserve the pattern of the fabric if there is one, during this process. Trim round the opening of the drawer again and see that the extreme edges of the material are well glued down in place.

Cover the front of the drawer with the fabric. The inside may be either stained with a suitable wood stain or else lined with white or coloured paper. The material used for lining the inside of the box should be of some contrasting colour to that on the outside. It is put in in a similar manner to the outside covering.

The wood for the lid measures 12½ ins. by 10½ ins., and to stiffen the piece, an inner frame of 1 in. or ¾ in. wide wood ½ in. thick may be added flush with the edge all round. Cover the lid with the paper and fabric in a similar way to the box and then hinge the lid with a pair of 1 in. stout brass hinges. Cover the inside of the lid with silk to match the interior of the box and then

(Continued foot of page 234)

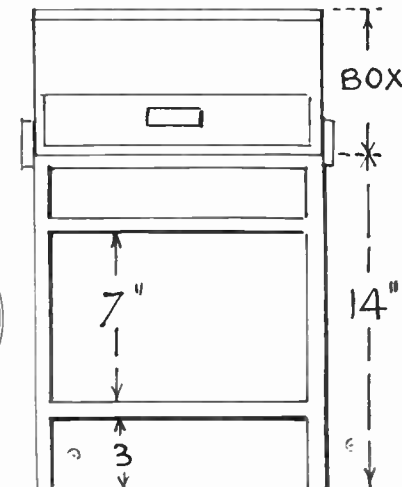


Fig. 3—Skeleton of stand framework

How the handyman can service noisy water TANKS AND CISTERNS

If you happen to live in a house with some kind of cistern in or near one of the upper rooms you may have often been exasperated late at night by the time the cistern takes to growl to quietness after the last person has drawn off hot water for a late bath or wash. Worse still is a steady drip, drip through the night. Once in a while the noise may drive you almost to madness or set you thinking of 'Bloop Bleep'.

Perhaps you think that the best cure for the drip is to turn off the water at the main, get at the tank, withdraw the split pin on the ball arm, extract the cylinder containing the india rubber washer, replace the washer and repeat the stages of the job in reverse, ending by turning on the water again.

A Cure for Drip

In nine times out of ten this is all that is required, but occasionally there are other difficulties. If the washer does not protrude enough it may not be pushed hard enough against the water pipe to stop the flow completely, even when the ball floats up. The cure is to put a tiny packing of cotton wool or yarn behind the washer to make it bulge a little more, as shown in Fig. 1.

In times past somebody may have thrust something like a screwdriver along the cylinder socket to the point to which the washer presses. In this case the brass may have been scored, leaving a tiny channel for a perpetual drip, even after a new washer has just been fitted.

One cure is to unscrew the pipe and fitting, and with a small triangular file gently file the water pipe opening until the scoring has been ground away—a job which will take, perhaps, 20 minutes. It should, however, seldom be necessary to take such drastic action. The necessity for it can be determined by putting the little finger up to the washer seating and scratching about with the fingernail to feel for any irregularity.

The Cause

Having done one or other of the jobs mentioned you may still be maddened to find a tank drip steadily and wilfully

during the night. This may be because it is the cold supply tank for a hot water tank heated by a domestic fire which goes out each night. During the night the water of the hot tank grows smaller—contracts—as it cools, and this is equivalent to leaving a tap on the hot cistern dripping slowly.

Reducing Noise

The obedient cold tank, therefore, itself starts to admit drips to the cold tank to keep up the level. This distressing malady might seem incurable at first thought, but there are actually two ways of tackling the trouble.

The first method will help deaden

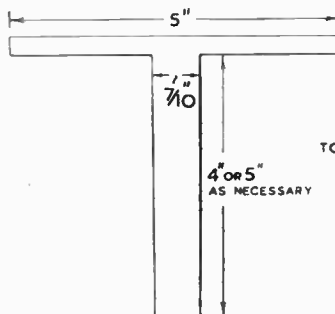


Fig. 2—A metal 'T' fitting

other than drip noises. It is quite simple and applies to all uncovered tanks with ball valves. Place a flat sheet of thick cardboard over the top of the tank, cutting small slots to fit the sheet round any pipes which may run into the top of it. The reduction of noise in an open cistern in an upstairs cupboard is astonishing. Somehow the noise of running water builds up or resonates more in the whole cupboard, but when the bulk of the sound is reflected inside the tank by the cardboard, the noise is much reduced.

Noise Reduction

A general reduction of noise may relieve the house of hot tank noises it has been enduring patiently, perhaps, for years. But may still leave the faint insidious sound of a drip to become

loud and annoying during the night.

For an Emergency

The noise is caused by the fall of water drops from the valve 2 or 3 ins. to the surface of the tank. If these drips can be caught on something and allowed to run down into the water, the drip noise is cured.

An emergency method—not to be recommended—is to tie a bit of string or thin cloth in such a manner that the drips are caught and run down. But the danger of such a scheme is that move-

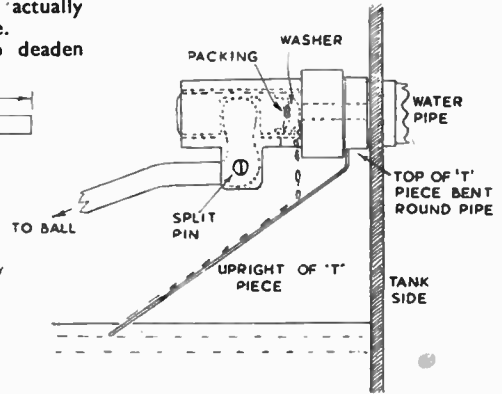


Fig. 1—Packing a washer to prevent drip

ment of the anti-drip material may foul the cistern arm, or on rotting away after a year or two, get into the pipes.

A 'T' Piece

The best method is to make out of copper or brass sheet a 'T' piece of dimensions approximately as shown in Fig. 2. The top of the 'T' should be bent round on the neck of the fitting and can be wired in place or even soldered if the fitting is dismantled.

The T upright under the fitting is bent to slant down into the water, as shown in the diagram, and catches the drips when they have fallen, perhaps, $\frac{1}{2}$ in. This sound cannot be heard. Test the device to see it does not cause splashing when the valve is well open. This, and a cover should reduce the most boisterous tank to abashed murmurs. (193)

Work Stand—(Continued from page 233)

add the loops and small pockets as suggested.

A simple handle should be added to the drawer of thick wood cut to shape with the fretsaw and screwed in from inside. The handle should be painted or varnished. The bottom of the box should have a piece of baize glued on to within an $\frac{1}{8}$ in. of the outer edge all round.

It is optional, of course, whether the box should have a stand, but if used in the garden or on the lawn, the addition

would certainly be well worth the time and trouble of making. In Fig. 3 a skeleton diagram only of the stand is given with suggested sizes. With regard to the material for it, $\frac{3}{8}$ in. or $\frac{1}{2}$ in. square stuff is very suitable.

There are two or three methods of jointing the pieces together, the rails may be tenoned into the legs, this makes a good strong job, or the rails could be dowelled into the legs. The cross rails being arranged, as shown in the diagram, hold the legs well together

and should make the stand perfectly rigid.

The top of the stand is framed between the legs and here brass angle plates may be introduced to stiffen up the fastening and joints. Around three sides of the top are upright rails 1 in., Fig. 3, about 2 ins. wide and of $\frac{1}{4}$ in. stuff. These must project above the table top so the work box will slide in and be firmly held. The whole thing may be painted up in colours to suit the work box.

Some worth-while hints if you undertake PAINTING MODEL LOCOS

It is queer how the painting, lining and lettering of a loco body presents a mentally insuperable difficulty to many really skilled model engineers, even though they may have produced many excellent examples of engine body-building work. Most of these inherent fears are generally without foundation, and it would be true to say with that great statesman, the late President Roosevelt, that the 'only thing we have to fear is—fear'. It is a question of taking ones' courage 'in both hands', and making a start. But—a right start must be made.

Scribed Lines

Few model railway engineers realise that a good 'professional' paint finish has its genesis in the earliest processes of actual construction—viz. the lines scribed on to the metal sheet before even the parts are cut out.

These lines are too often scribed so deeply that all question of their subsequent eradication becomes impossible, and they thus remain to show through as many coats of paint as one cares to lavish on the finished model. The moral is obvious—be as light-handed with the scriber as possible, only producing as deep a line as is absolutely needed for legibility.

Solder Joints

Another point which is frequently missed is that which can give a lot of trouble at the painting stage—that of poor and inefficient soldering. By ensuring that all constructional joints are sharp and clean, and that no 'dry' or 'blobbed' ones are allowed to remain on the completely-constructed bodywork, unsightly dimples and bumps—which no amount of filler or undercoating will eradicate or conceal—will be entirely eliminated. Paint will 'cover a multitude of sins', but it will not remove them! Truly, a perfect model loco paint finish starts in the metal-working stages.

It may not be known generally that paint does not 'key' on to brass very well, particularly if the metal has been highly polished. Many a good model—brightly polished for exhibition competition purposes—has been completely marred by its builder attempting to paint it in the polished state without any previous treatment.

Dull Surface

It is often forgotten that the metal-polish which has been used to produce the bright finish contains paraffin oil, and that the perfectly even shiny surface must first be dulled—i.e. scratched with minute lines—before any attempt is made to paint it.

This dulling may be carried out either with 'blue-back' dipped in water, or by dipping a piece of silk in a mixture of

'FFFF' emery powder and water. (Emery abrasive finer than that which passes through a sieve with a mesh of 200 to the linear inch being sometimes sold under the name of 'flour' emery).

Leave the Tarnish

If the body has never been polished brightly, and appears tarnished, it is a good plan to allow the tarnish to remain, as this will give a proper anchorage to the first paint coat, and a tough shock-resistant surface will be produced.

After the surface of the metal has been suitably roughened, and all the inequalities of the surface have been removed, the next process is that of chemically washing the body till absolutely all traces of grease and oil have been removed. It is not enough merely to dust down with a small brush (some people using the same brush as that used for painting for the purpose!) which simply moves the oil and dust from one part of the model to another.

The body must be literally washed in a liquid which will solve grease and oil, and in this respect the reader would be well advised not to use petrol (of any colour!) for the purpose; as this fluid—even 'lighter fuel'—is far from pure. The best thing to use is benzine, which is obtainable at the chemist's, and can be said to be as free from oil as one could possibly wish.

Gas Warning

Ethylene Dichloride and Carbon Tetrachloride ('Thawpitt') are both quite good, but the former has a nasty quality of forming the poisonous phosgene gas when mixed with tobacco smoke. So if used, it should be manipulated out of doors in a breeze—and No Smoking! Benzine is, of course, highly inflammable, so due care is necessary to avoid any accidents.

There are professional model-makers who insist on the superiority of caustic soda for grease-removal, but in the writer's opinion, its use is both dangerous and unnecessary unless old paint of a very obstinate nature is being removed, and it is possible to completely immerse the whole loco body in a covered bucketful of caustic for 24 hours.

It is a dangerous substance—all the more so because it looks so innocuous and innocent, neither fuming nor

smelling in any way—and rubber gloves should be worn during all handling operations. Any splashes on the clothes should be immediately liberally treated with vinegar or acetic acid, for if this is not done, every splash will mean a hole.

Incidentally, a hair brush must never be used with caustics, but one of fibre or glass-wool. Failing either, the odd quirks and corners in the loco body may be cleaned with a sharpened stick of hardwood. (When finished with, all the caustic should be disposed of down an outside drain, and the latter washed down with water).

Little Handling

After either benzine or caustic washing, the body should be handled as little as possible, so that grease from the pores of the fingers does not get upon its surface. It is a good idea to hold the body where possible between the thumb and forefinger, gripping the extreme edges of the footplate and allowing the boiler to occupy the space under the palm of the hand.

In any case, make a definite point of never touching any of the larger surfaces, such as the boiler, cab sidesheets or tender-sides, as these are already not easy to paint flat with a brush, without any extra problems arising from surface grease.

As regards the paint used, it may be said truthfully that any really good undercoating may be used providing that it is strained through clean silk before use and that only pure spirit of turpentine is used to thin it somewhat. For the subsequent colour-coats, it is best to use those specially ground and matched by any of the several model firms advertising in these pages. It is not worth while to try and mix one's own.

Thinning Instructions

When using model paints be certain to adhere strictly to the maker's instructions in regard to thinning and methods of working and, above all, do not experiment! The makers have done all that for you.

When applying paint, always be certain to lay on sufficient at the corners and projecting angles (such as the rounded corner between the top of a Belpaire fire-box and the boiler-barrel) for paint has an odd habit of drawing away from corners and protruberances.

It is also a mistake to finish off a narrow edge (such as a footplate valance) by drawing the brush across a corner. Always finish off by pulling the brush down the whole length of the surface for its last stroke.

In all the painting work the reader will find his worst enemy is dust. It seems to be everywhere directly one decides to paint a model loco! The writer has found that out-of-doors is best, if it is a calm day, when the dust

A Suitable Hack-Saw

If you happen to break a hack-saw blade, do not discard it. Take the best piece, fit it into an old handframe, and you will find you can use it for a considerable time in this way.

has been laid and the air cooled by a shower of rain.

The Best Place

Failing these *desirata*, a cool greenhouse or conservatory is excellent. But never, in any circumstances, attempt to get good results by working in any room where there is a carpet or where people are always going to and fro upon their lawful domestic occasions—such movements produce a veritable sand-storm!

Finally, never work in a coat, but with the shirt-sleeves rolled up high. This may sound facetious, but it is surprising the amount of dust which drops on to one's work from the coat-sleeve; which is always in movement as one works.

If a fast-drying paint is being manipulated, it is a good plan to wash occasionally the brush in pure turpentine, as otherwise the 'heel' of the former will gradually become charged with partly-set paint and lose its springiness and thus fail to lay on the colour evenly and without ripples. The

brush—if a $\frac{1}{4}$ in. or $\frac{3}{8}$ in. flat one—should be kept flat by loading it with paint occasionally and drawing it along a waste scrap of metal, which treatment helps to keep the hairs in good fettle.

Each individual surface should be painted individually, keeping all unavoidable joint-lines behind in the shadow, so that they are inconspicuous. Thus, breaks in the continuity of the footplate painting should be made where the splashers protrude, and in the case of outside-framed engines, the spring drop-hangers form a convenient point for a break-line.

Direction of Painting

Always work away from, rather than towards small projections such as lamp-irons, couplings and buffers. Never allow too much paint to run into right-angled crevasses and seams, as nothing 'gums up' the best of models easier than this simple mistake. Remember, too, that two thin coats are much better than one heavy, syrupy coat; which not only dries slowly, but effectively blinds

out all the super-detail to which one has been put to such pains to faithfully model.

Hard First Coat

Allow the primer (undercoat) to dry thoroughly, and very carefully remove any 'knibs' or settled dust-flecks with the silk and flour emery, using the very lightest pressure possible during the process so that the bare metal is not exposed where the treatment has taken place.

The actual colour-coat or coats may now be applied in the same way, making each successive coat of a slightly different shade to the previous one, so that any inadvertant gaps may be detected instantly.

The model should be continually examined at all stages to ensure that every portion of its surface is covered. If any gaps are allowed to remain, it is completely impossible to cover them afterwards without their presence being detectable in the final coat. Time well spent will make the model worth while.

Invisible writing and novel cyphers can be used in SOME SECRET CODES

IN days of old when civil war waged it was often necessary for leaders of opposing parties to write their letters in code or use 'invisible' ink in case the messenger was waylaid by enemies on the road. Codes and ciphers, of course, are still employed today in despatches concerning secret military information. During the war all governments maintained a special staff of highly skilled experts to decipher enemy documents or invent codes for their own use.

There are hundreds of ways of writing secret messages, and if you are interested here are a few notes on the subject. If you wish to send a letter to a friend which only he can read, here is a very novel method. Using a clean quill pen (make your own from a large feather), write your message in a solution of cobalt chloride. Although the words will appear green in colour when written, they will disappear if breathed upon and not reappear until your friend heats the sheet of paper.

A Burning Message

Equally novel is the following method. Into about half an eggcupful of water place sufficient saltpetre (obtainable from chemists) until the water refuses to dissolve any more. With the end of a wooden penholder write your message in the solution, being careful to join each word, and line of words or letters, to the next. The writing must be continuous.

Your friend (who is 'in the know') applies a red-hot matchstick to a pre-arranged starting point on the paper and a thin trail of fire like a smouldering

fuse will burn its way along the path taken by your saltpetre 'writing', thus revealing the hidden message.

If you write or draw on coloured paper, using a solution of nitrate of bismuth as your 'ink', the work will be invisible when dry, but on damp, the lines will appear in white.

By writing with a weak solution of copper sulphate you can produce a secret message which requires the fumes of smelling salts (or a little liquid ammonia) to render visible. The writing can be rendered invisible again by holding the paper before a gentle heat.

So much for invisible inks. Now for a few codes and cyphers. Cut a long narrow strip of paper and wind it around a length of bamboo cane or broom handle as though you were putting on a puttee (i.e. overlapping each turn of paper slightly).

Now write your message along the length of the paper-draped rod and then unwind the paper. Arrange beforehand with your chum to have a rod of the same diameter as the one you used. By winding your strip of writing on to his stick carefully, he will be able to decipher the message.

Alphabet Codes

There are countless variations of the following code. The alphabet is first written across a sheet of paper from A to Z. Underneath each letter in the top line substitute an alternative letter (or number) thus:

A B C D E F G H I J K L M N O etc.
D C B A K J I G F E O H L M N etc.
Using the above, the word BOOK

would be written CNNO or the word LION thus: HFNM.

Ogham, an ancient form of Irish writing, will give you a simple but baffling code. Here is the alphabet, which contains twenty characters:

B L W S N
 H D T C O U
 M G N G F R A O U E I

The word HOBBIES using the Ogham alphabet would be written:

H O B B I E S

The Morse code can be made more puzzling if the dots are placed above a line and dashes below. Here is the word MONDAY in ordinary Morse characters:

M O . N D A Y

Here is the same word written the 'puzzling' way:

M O N D A Y

If you think that too difficult, make small 'mountains' for dots and large ones for dashes. Here is MONDAY by this method:

M O N D A Y

All these secret codes are interesting to work out and use in private correspondence, name marking, etc.

A PHOTOGRAPHIC ALPHABET

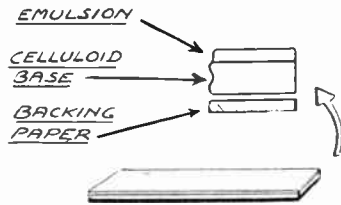
Short illustrated hints for the amateur. Look out for the remaining letters and notes.

E for—

EMULSION

THE film' which we buy from the chemist tightly rolled on to a wooden or metal roller is made up of three distinct layers:—(1) The Backing paper, (2) 'Base' and (3) Emulsion.

The emulsion is the layer that does the work of taking the picture and is composed of some light-sensitive salt such as silver nitrate, suspended in a surround of collodion or a similar substance. This is run, when in a liquid state, on to the 'base' which is a strip of



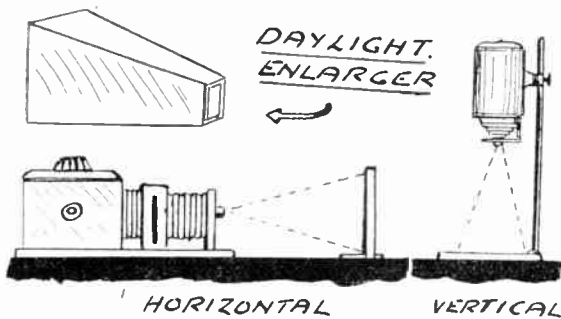
transparent celluloid. The backing paper goes behind the two and is for protection.

Being light-sensitive means that a material reacts differently according to the amount of light that falls on it, and as an image of the scene outside is thrown on the emulsion of a film the picture is built up by the varying reaction of this to light and shade.

Emulsions vary a lot, some being more sensitive to light than others. Their sensitiveness is spoken of as 'speed' and the faster the film the greater its sensitivity. Most emulsions are sensitive to red rays (hence they can be developed by a red light) but others are sensitive to all rays, these being called 'panchromatic' (all colours).

ENLARGING

THIS is a very fascinating part of photography and is the making of big prints from little negatives. It is done by projecting a picture of the negative on to a sheet of sensitive paper in just the same way that a magic lantern throws a slide on the screen.



The projection acts as would a negative of that size and so a big print is obtained on the paper.

There are three types of enlarger:—the horizontal, vertical and daylight. The horizontal is exactly similar to a magic lantern, with an easel upon which the picture comes standing in front just like a little screen. In a vertical enlarger the lens points downwards, the printing paper being laid horizontally on the base. This type is now very popular as it makes composition and the adjusting of the paper very easy.

The daylight enlarger is in the form of a box with the sensitive paper one end and the negative the other. Here a dark-room must be used for loading and the instrument is then taken out and pointed to the sky to make the exposure.

EXPOSURE

A BOOK could be written about exposures. The name covers the length of time that the light from the subject is allowed to play on the sensitised emulsion of the film. This time can be from the smallest fraction of a second to many minutes, everything depending on the actinic value of the light and the size of the lens opening.

Roughly all exposures fall into two groups 'Instantaneous' and 'Time'. The first means any exposure down to about $\frac{1}{25}$ second, the shutter just flashing across the lens, while the second may run into many minutes, the shutter opening and remaining open till the trigger is pressed again.

Most box cameras work at a standard rate of $\frac{1}{10}$ second for a snap, but by a slight adjustment, time exposure of any length can be given.

The best way to get exposures correct for various subjects and light strengths is to use one of the simple charts that are often given in the back of photographic diaries, etc.

F for—

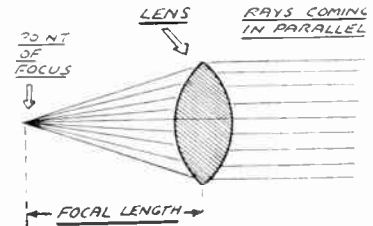
FOCAL LENGTH

THE focal length of a lens is a different thing to the f numbers which indicated the size of stop. It is a definite quality of a lens and does not differ with the stop numbers.

It is found by measuring the distance between the lens and film (the image being in sharp focus) when the rays entering the lens are parallel to one another, that is to say when the item focused is at infinity. In actual practice a subject at

a few miles distance gives virtually parallel rays.

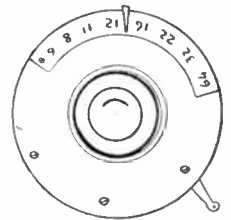
The main thing an amateur should know is that the longer the focal length of a lens the bigger the picture it will



give from any given position, the size varying in direct proportion to the focal length. Thus a 6in. lens will give twice the size of picture of a 3in. lens. Short focus lenses take up less space and give a greater 'depth of focus' than long focus and so they are most often used for miniature cameras.

'f-NUMBERS'

IN front of a camera you will see a small pointer which runs round a scale upon which are scribed f 8, f 11, f 16, etc. These are the 'stop' numbers and tell you the size of the opening in front of the lens through which rays are getting to the film. This opening can be changed in size by moving the pointer and the variation has the effect of controlling the amount of light passing. It also does one or two other useful things.



The figure shown means the number of times the diameter of the opening will go into the focal length of the lens (virtually the distance from glass to film). Thus f 8 means the diameter is $\frac{1}{8}$ of the focal length, f 16, $\frac{1}{16}$ and so on.

Smaller openings need more exposure and the variation is according to the square of the area of the openings concerned. For example, if an opening was twice as big as another, the smaller would require four times as much exposure.

FOG

THE only rays of light to reach the film in a camera should be those coming from the image. Sometimes rays get in some other way, as, say, through a hole in the bellows, and these blackening in the part on which they fall, appear on the print as white areas. The work of such vagrant light-rays is spoken of as 'fog'.

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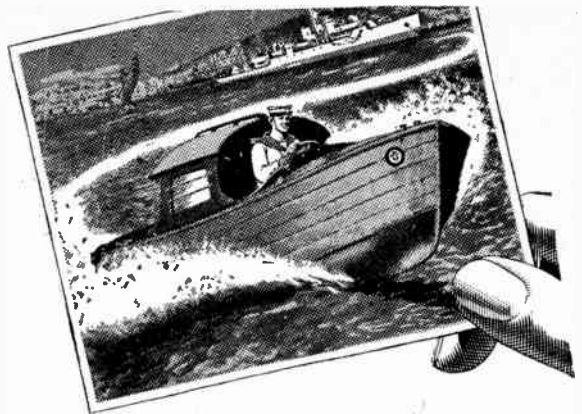
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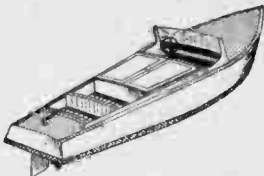
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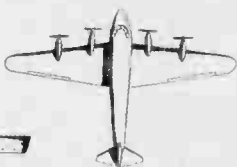
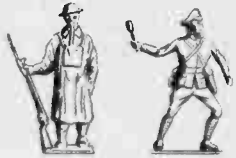
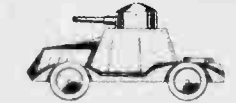
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Hobbies

WEEKLY

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MOST people know that the Ancient Britons used coracles, but not so many are aware that these light craft are still used today, chiefly by fishermen on the Severn and Wye, and also in Clare, Ireland, where they are known as Currachs. They are light and strong, besides being cheap and easy to make, and for these reasons modern handymen may care to make one.

A Useful Craft

For fishing, duck shooting, ferrying purposes and general 'exploration' work they have advantages over larger craft whilst in shallow, safe waters, the coracle makes an ideal plaything for an active young person. A home-made coracle is much more fun and certainly cheaper than an ex-R.A.F. float. The expert can handle the coracle in rough water, but readers are cautioned against taking such a craft on the open sea or on rivers with tricky currents.

In shape, the coracle is rather like half a pear, and consists of a wooden, basket-like framework, covered with tanned canvas, and measuring approximately 4ft. by 3ft., holding one person only. The coracle is propelled by sculling with an oar over the more rounded end.

With or Without Rowlock

In the present model the bracket holding the rowlock is a comparatively luxurious refinement. It is optional whether this is made for it is possible to do without it, but since it makes

sculling easier for amateurs, its use is recommended.

The best wood to use is ash, 1½ ins. wide and ½ in. or a little more thick, or as near to this as you can get. You will require:

- 8 pieces 8ft. long (horizontal strips in the plan).
- 8 pieces 9ft. long (vertical strips in the plan).
- 2 pieces 10ft. long (diagonal bracing strips).
- 2 pieces 18ft. long (inner and outer rims).

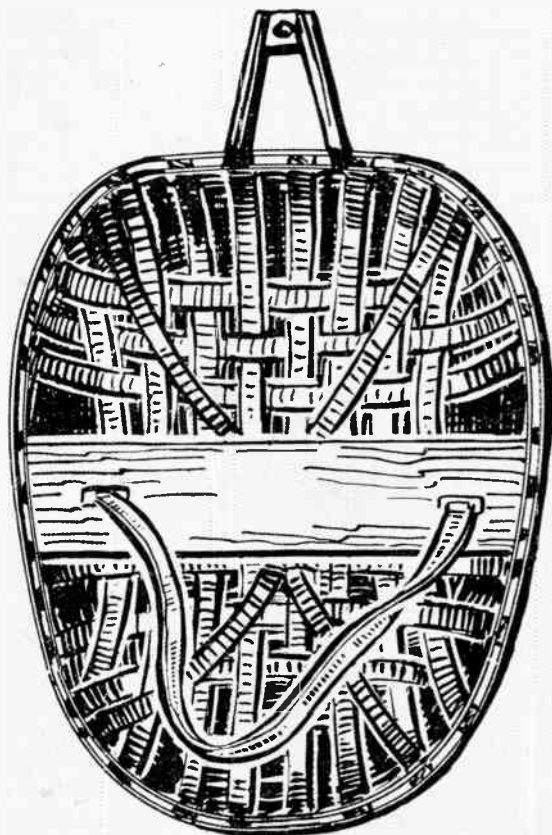
In the last-named it may not be possible to get so long a strip in one piece, consequently two strips will have to be joined.

The strips should be well steamed in a steam chest if you have one, or else soaked in water for a week to make them pliable. The two sets of eight strips are then taken and woven through each other, as clearly seen in the drawing. The ends of the ribs are then curved upwards.

The easiest way is to curve up the two ends of one strip and tie the ends across with a cord, which may be adjusted as required.

Copper Nails

When the whole 16 cords have thus been fixed, and the diagonal braces fitted, the inner and outer rims may be applied. Copper or galvanized nails are driven through both rims and ribs and clenched



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over. (Ordinary nails would rust away in a few weeks). Nails may also be driven through various crossings of the ribs, taking care not to split the wood.

The sizes given for the lengths of strips are on the generous side, so the ribs can stick up about 4ins. to 6ins. above the rim and be cut off afterwards making a neat job. The drawing on the right is rather diagrammatic. The strips, when bent, look more like the picture on the previous page.

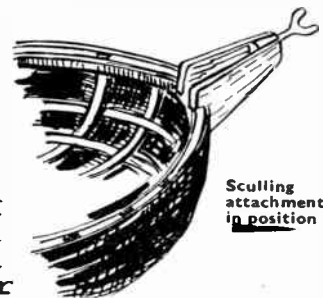
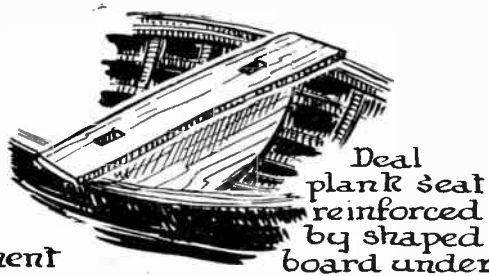
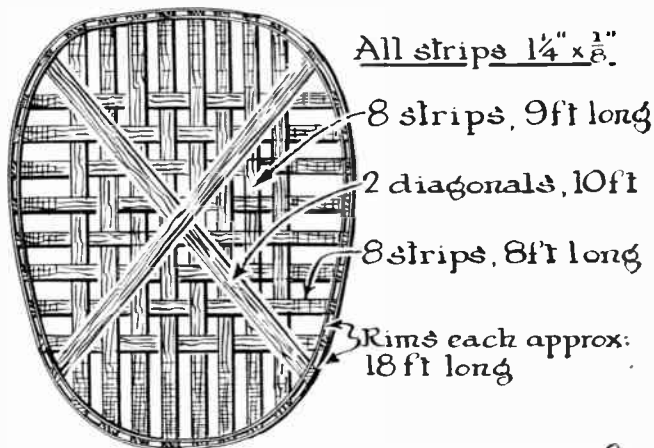
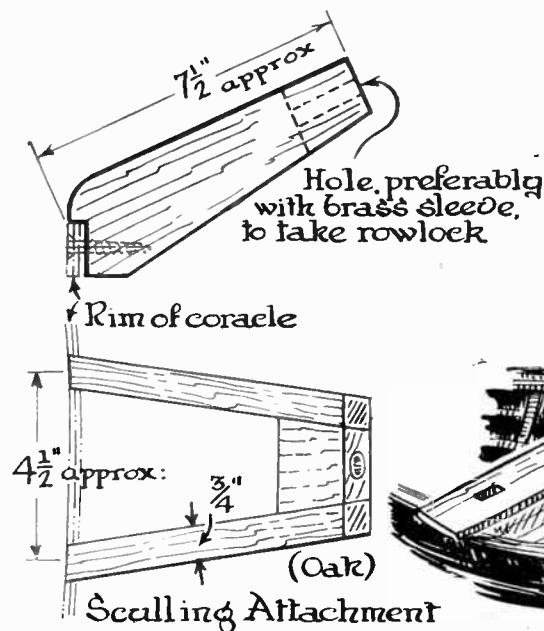
To be historically accurate, you would have to cover the framework with

Give the canvas a coat of tar, so the whole coracle is waterproof. If tar is considered too messy, paint can be used, several coats being required.

The seat is a plank of deal screwed to the framework at its widest part. Underneath, at right angles to it, is a curved board. This reinforces both the seat and the framework. In the seat

brass screws) to the rim at the front of the semi-circular end, about 4½ins. apart, and converging inwards. At the end a block is fixed. This is drilled with a hole to take a single rowlock, and will wear better if provided with a brass sleeve.

When next visiting a boathouse, one should enquire if they have a spare



animal hide. Canvas, however, is quite useful, or a piece of rough tarpaulin. For economy, however, an old tent, etc., may be utilised. Give the framework a coat of tar, and then, when dry, apply the canvas, tacking it well at the top, and pleating neatly where necessary.

two slots are cut, to take a broad strap to carry the coracle on ones back, just like a snail with its shell.

Finally make the sculling attachment. First take two pieces of oak about 7½ins. long and ¾in. thick, and shape them as shown. They are firmly screwed (with

rowlock and a secondhand light oar or paddle to dispose of. The paddle is pulled from side to side, and canted over at every turn. It is difficult to explain this in print, but experience or, preferably, a practical demonstration from an expert, will soon show how.

Craftsman's Notes—

Islands for Sale

SUCH books as 'Swiss Family Robinson' and 'Coral Island' must have enthused many a young reader with the idea of life on an island. For many not the least attractive feature of the adventure would be the opportunities for using their skill in making the place habitable with whatever tools and materials were available, while others would fancy the possibilities of exploring and studying natural history.

For most of us, enthusiasm for such a novel mode of life soon wears off, preferring to pursue our handicrafts and hobbies in more orthodox surroundings. But any who still fancy island life, and quite a number do, can sometimes buy or rent an island for themselves around our own coast. During recent months I have noticed the 160-acre Channel Acre Brechou for sale, and holdings to let on Stroma island in the Pentland Forth.

Islands of various sorts and sizes occasionally come on the market in this way. On some there are other people to share one's company, like Stroma, with about 100 inhabitants and one church, one school, one shop, and a lighthouse. Others, although so near our mainland, are yet so isolated that an occupier would have a real Robinson Crusoe existence.

Preparations for Painting

RE-PAINTING shabby woodwork is one of the home decorating jobs which amateurs often like to do themselves, but eagerness to get busy with the brush should not tempt one to skip the essential though rather more tedious preliminaries. A good clean foundation for the new paint makes all the difference to the finished job.

A blowlamp and scraper are desirable to deal with really shabby work, though amateurs may not wish the extra

expense of these unless there is a good deal to do or the surface is extra bad. They will probably find it sufficient to wash the old paintwork thoroughly, using hot water and plenty of energy.

Add a handful of soda to the bucket of water, and, if possible, use some soap on the brush as well. If there are any particularly greasy patches, a rag moistened with turpentine is helpful. After washing, wipe over with a clean damp cloth, then when dry, rub smooth with glasspaper, dust down, and there will be a good base on which the new paint will take well and dry well.

The quantity of paint required depends so much on the condition of the wood that amateurs will find it convenient to start off with a small quantity to see how far it goes. A pound may cover something like fifty square feet, but this is only a very rough idea, as rough wood takes more paint than smooth, and first coats more than later ones.

How the radio amateur can build an economy PERSONAL PORTABLE TWO

MANY midget loudspeaker portables employ three or four valves, the latter usually in a superhet circuit. But experiment shows that two valves are ample to provide loudspeaker results from the two or three stations normally best received in any particular area, provided frame-aerial and other circuit details are efficiently arranged.

This results in a very considerable reduction in first cost of the components compared with a 3-valve or superhet receiver, and the life of the batteries is almost doubled. In addition, complications in construction are avoided.

Results Obtained

Used in various Midland localities, the set provides good speaker results from Midland, Light, and 3rd Programmes. Other stations are also receivable, giving fair speaker results. This is with the internal frame-aerial, and though a short external aerial would, naturally, increase volume, such has not at any time been thought necessary. In many areas long waves are worthwhile and the frame-aerial covers these in addition to the usual medium wave band.

A pentode detector is used, followed by a tetrode output valve, and two or three points must be noted if maximum results are to be obtained.

The frame-aerial should be wound as will be explained, as it will be found that

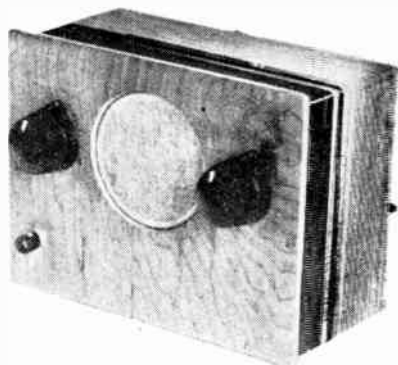
using pile windings, or windings where the turns are closely together, will result in a noticeable reduction in signal pick-up.

Secondly, the coupling transformer between the valves should be a good-quality full-sized component with a ratio of about 1:5. Various midget transformers were tried here and each caused a most noticeable reduction in volume through their inability to provide sufficient primary impedance for the pentode detector. In fact the reduction in volume with some small transformers proved so severe, resistance-capacity coupling was preferable.

Finally, the midget speaker and output transformer should be obtained together from the same manufacturer or supplier, and the latter should be suitable for a midget output pentode. Otherwise serious mis-matching in either the primary or secondary circuit of the transformer may arise.

Case Construction

The panel is cut from 3-ply to the dimensions shown in Fig. 4. As illustrated in Figs. 2 and 5, the aerial is wound on a box-shaped frame screwed to the pane, but slightly smaller. Four pieces of 3-ply $3\frac{1}{2}$ ins. deep are required here. Top and bottom pieces are $6\frac{1}{2}$ ins. long and each side is $4\frac{1}{2}$ ins. long. The pieces fit as in Fig. 5. The whole should be rigid, and the corners of the frame should be bevelled.



Photograph of the Author's Set approximately the diameter of the wire.

All other sections are close-wound and to assure adequate long wave reaction the 22 turn section of the reaction winding should be as close the 80 turn long wave section as possible. To facilitate wiring up, the ends of the windings are numbered to agree with Figs. 1 and 3.

When the frame-aerial is complete a long strip of brown paper is wound tightly round it so that turns are not moved when the set is pushed in a suitable case, the internal size of which will just give clearance to the aerial.

Wiring the Receiver

Fig. 3 shows all connections. The intervalve transformer is mounted on the side of the frame upon which the aerial is wound (see Fig. 5). Fig. 3 is a 'flattened' diagram and normally the transformer will be immediately behind the reaction condenser, as shown in Fig. 5.

The valveholders are fixed to a piece of thin wood or metal about $\frac{3}{16}$ in. by $1\frac{1}{2}$ ins. and this is held immediately below the tuning condenser by brackets, as also illustrated in Fig. 5. In Fig. 3 the valveholders are shown moved down below the panel so that connections can be indicated.

The switch will need to be a small type if maximum space is to be left available for the batteries. In the first position the set is off; in the second position, the L.T. negative circuit is completed and the set is on; in the third position the set is also on and the frame-aerial switched to medium waves.

Insulated leads should be used throughout. All parts are positioned as shown in Fig. 3, with the exception of the holders and transformer mentioned, which are placed as in Fig. 5.

The speaker will need to be fixed by

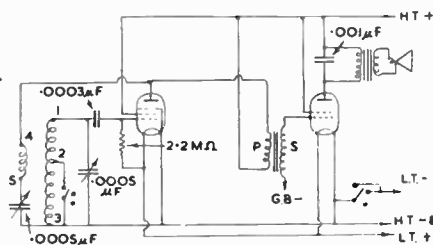


Fig. 1—The theoretical circuit of the set

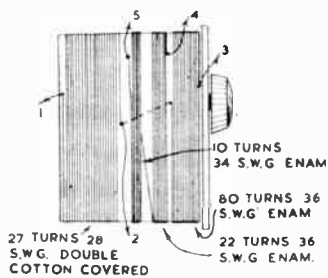


Fig. 2—Aerial frame windings

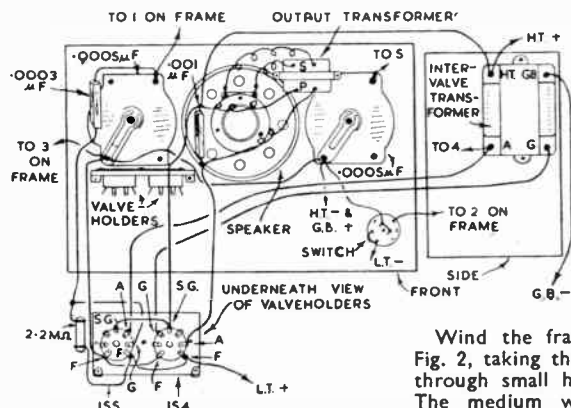


Fig. 3—Complete wiring diagram

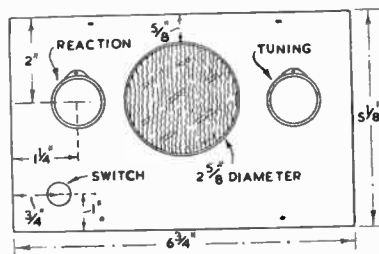


Fig. 4—Dimensions of front of receiver

Wind the frame-aerial as shown in Fig. 2, taking the ends of the windings through small holes into the interior. The medium wave section (between points 1 and 2) has turns spaced by

using three small screws and washers, fine gauze having been stretched over the panel hole.

Operating Notes

A 1.5 volt dry cell is used for L.T. and the consumption is .15 amp. For H.T., 45 or more volts should be used, and the Grid Bias will need to be between 3 and 6 volts, depending upon the voltage of the H.T. battery. The maximum screen voltage of the 1S4 is 67.5, the maximum output being .18 watts with this voltage also applied to the anode. If a midget 90 volt battery is used this should be remembered and the screen taken to a separate lead and appropriate battery tapping.

Tuning is quite critical and reaction should be used carefully, though on near stations it does not need to be employed excessively. If necessary, the set should be turned one way or the other as stations in line with the axis of the frame windings will not be heard.

Component Details

As a further guide to the constructor, the components used can now be dealt

with a little more fully. The valves are of the midget button-base type, a 1S5 being used for detection, with a 1S4 as output. The positions of the valves will be seen from the diagrams.

For these valves midget button-base holders are used, and, as will be seen, some of the tags are unused. These tags

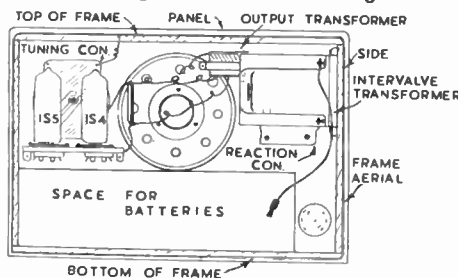


Fig. 5—The back spacing and fitting

must not touch any wiring because the valve pins which fit in them pass into the valves themselves and are used to support the electrodes inside, even when not used for connections. Do not insert the valves in the wrong holders,

and do not connect the batteries until the valves are in position. (If this point is not observed, the filaments may be burnt out if the pins are accidentally touched on the wrong sockets when inserting the valves).

Two small solid-dielectric variable condensers are used for reaction and tuning, and these should be fitted with fairly large knobs with pointers.

Various permanent-magnet moving coil speakers are obtainable, but as the speech-coil impedance is not standardised, the speaker transformer should be obtained with the speaker, as mentioned.

The receiver, made up as described, will fit completely inside the well-known war-time civilian gas-mask box, and a disused gas-mask carrier will prove ideal for it.

Great care should be taken to assure that no battery or other leads short circuit to each other, or to other parts, or valves or other components may be damaged. Sound insulation is, therefore recommended.

Add to the life and usefulness in your POCKET KNIFE CARE AND USAGE

BOYS of all ages are never really happy until they are in possession of a pocket knife. Many, however, get quickly tired of the knife, because in the first place there is lack of care with it, and secondly, it is used in a rough and ready way. Here are some points of caring for it properly.

If the knife is used to cut an apple or anything juicy, remember to carefully wipe the blade dry, or it will quickly become rusted. Remember a pocket knife is not a chisel; the blade should

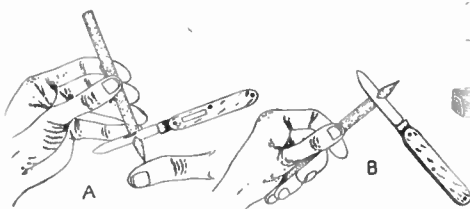


Fig. 1—Sharpening a pencil—wrong and right

not be knocked with a hammer when working on a piece of wood.

How Accidents Happen

Care should also be taken when using your pocket knife, since it is quite an easy matter to cut your fingers. As an example, in sharpening a pencil, the following hint will prevent cutting your thumb. In Fig. 1 (A) is shown a common method of sharpening a pencil which can easily result in a cut thumb. The pencil point rests on the thumb as indicated, and the knife is shown cutting the wood towards the thumb. Any slip of the knife if a pencil is sharpened in this manner will result in a cut.

Try sharpening in the manner indi-

cated in view Fig. 1 (B) with the knife blade working in a direction away from your thumb or fingers. You will by this method also get a much better point on your pencil.

Right and Wrong

Another example in the correct way

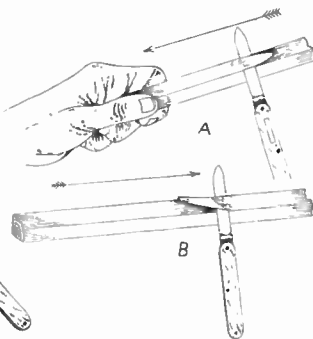


Fig. 2—Cutting a stick

of using a pocket knife is indicated in Fig. 2. This shows the knife being used to cut a stick of wood, and the method indicated at (A) should not be used. The knife is here again cutting towards the fingers of the hand holding the stick, in the direction of the arrow. Any slight slip of the blade will result in a cut finger or thumb.

When cutting a stick, use the method indicated in view Fig. 2 (B), which shows the knife blade cutting away from the hand holding the stick. A general rule for using the knife, is always to cut in a direction away from the hand which is holding the object to be cut.

There is another important point about the pocket knife, and that is the

question of sharpening it. There is no reason why you should not attempt to sharpen your pocket knife, but take a little care when doing so if good results are to be expected. Some people simply give the blade a rub on a piece of emery cloth, and wonder why the knife actually is in worse condition than before.

Sharpening

Always use a proper method for

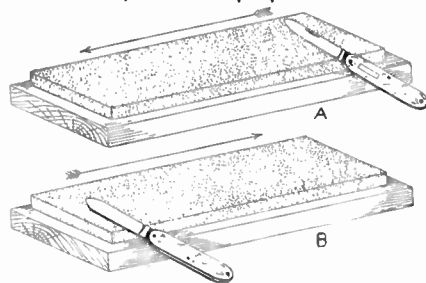


Fig. 3—Sharpening the blade

sharpening the knife, which is done in the following manner. A piece of oil-stone is best for getting a good edge on the knife. Smear a little oil on the surface of the stone, and with the blade slightly tilted, draw it over the stone from one end to the other, as indicated in Fig. 3 (A), in the direction of the arrow.

Turn the blade and push it over the stone in the reverse direction indicated by the arrow at (B). Repeat the operation several times, and then try the blade for cutting. After a little practice, you will soon become expert in sharpening your knife which will greatly add to the pleasure when using it.

(172)

Use the patterns on page 255 for making this MIDGET ELECTRIC LAMP

HERE is another novelty electric lamp, one that will catch the eye of the novelty maker. Such a lamp as this would be found most useful for the bedside table where a light is generally only needed for short duration and at perhaps long intervals.

Its attractiveness is brought about by the use of a moulded glass jar inverted and fixed in place on top of the box-like stand, this stand containing the four-volt double-cell battery. It is surprising what charming and brilliant effect can be obtained from these potted-meat and fish jars, and now they can be purchased in all shapes and sizes.

Jar for Globe

The jar illustrated here is $2\frac{3}{8}$ ins. high and $1\frac{1}{8}$ ins. in diameter at the largest part. The projecting rim top and its neck make it convenient in fixing as a globe or shade for a small electric lamp.

The overall dimensions of the battery just mentioned are height $3\frac{1}{2}$ ins., width $2\frac{1}{8}$ ins. and depth $1\frac{1}{8}$ ins., and these dimensions are of course carefully followed in determining the internal sizes of the lamp stand. Of course, the battery must not be a tight fit in the 'box', but space allowed for it to slide comfortably in place and to form contact with the wiring connections inside.

The Box

Proceeding with the stand or 'box', we first look at the sectional diagram Fig. 1. Note how the battery lies in the 'box', how it is held in place by two movable brass lugs, and how the contacts are arranged. The sides, ends and top of the box, and also the ornamental

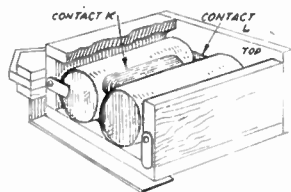


Fig. 1—Batteries in box

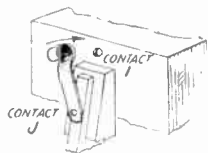


Fig. 2—The switch

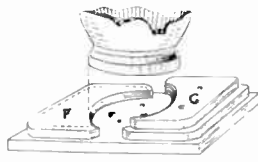


Fig. 3—Globe fixing

projecting pieces on all four sides, are cut from $\frac{1}{4}$ in. wood.

A useful sheet of patterns is on page 255 of this issue, and all the above-mentioned parts are shown full size. Prick off each outline on to the wood, taking into account the direction of the grain for each particular part. Join up the points with a strong firm pencil line. Make two sides, two ends, one top and four of outline (D) and eight of outline (E).

In one of the sides (A) bore a hole where it says 'screw I' and run in a $\frac{3}{8}$ in. round-head screw. Previous to actually putting the screw into the hole however, loop round it a piece of cotton covered brass or copper wire and pass this through the hole into the inside of the

box and then run the screw home, screwing it up tightly. This makes the switch contact 1 (Fig. 2) and seen in the wiring diagram at the top right of the pattern page.

The Wiring

Now take in hand the top of the box and make the four holes as indicated on the pattern sheet. The holes marked (O) and (H) are to take wires leading down into the box from the bakelite bulb holder. The wire (I), already mentioned as being fixed to the switch screw (I), will be brought up through hole (H) and connected to the bulb holder, see wiring diagram. The wire from (O) runs down inside and connects up with the screw which forms the fixing screw of the switch handle at (J).

A fairly large hole must be made next in the front of the box at (J), and after the shaped feet pieces (D) and (E) are glued on here, a hole must be made in them exactly opposite the hole already mentioned and made in the front at (J).

Switch Handle

Later on, when the side foot pieces are glued on, a round-head screw about $\frac{1}{2}$ in. or so long will be run in, round which again a short loop of flex is bound and allowed to project into the box to make contact with the side brass plate on the battery at (K), Fig. 1. The switch handle (N) on the pattern sheet will be put over the screw (J) at the same time the wire is threaded through at this place.

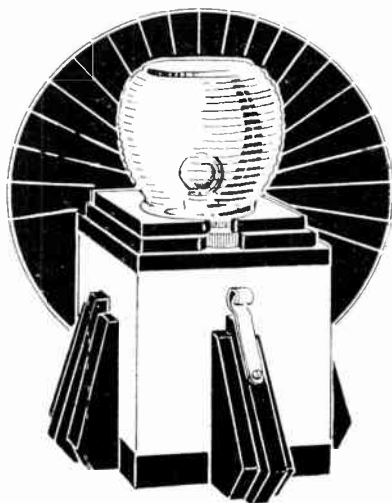
In arranging the various wires inside the box, keep them close to the surface, and it must be borne in mind also to use either cotton-covered or japanned wire

for insulation. Sufficient clearance must be allowed inside the box for the passage of the battery.

Feet Pieces

At (M) on the pattern sheet the outline of the lugs and method of fixing them are shown, their position at the base of the box being given at Fig. 1. These should work stiffly about the screws and so hold the battery securely in place. Each of the side feet consist of two pieces (E) with one piece (D) between them. See the back straight edges are uniformly flat and lie evenly to the box surfaces indicated by the dotted lines on the patterns.

The shaped pieces (F) and (G) are to



hold the glass globe in place, and two of each piece must be cut, (F) being $\frac{1}{4}$ in. thick and (G) $\frac{3}{8}$ in. thick. Trace and transfer the patterns from the sheet on to the wood, or, again, use the patterns for sticking down direct to the wood. When cleaned and ready for fixing to the top of the box, get the glass globe, stand it centrally over the bakelite holder, and mark round the brim in pencil.

Fitting the Globe

Now take pieces (F) and glue them to the box up to the pencil lines and after just gluing them, and before the glue has set, stand the globe between them for a perfect fit. Finally, put the globe in place again and put on each side of it the pieces (G) close up to the necking of the globe. Allow just a little movement as clearance, then run in the fixing screws, but do not add glue as, should the glass globe become broken, it can easily be removed and replaced.

Round the base of the box can be glued thin pieces of wood about $\frac{1}{4}$ in. wide to fill in the gap at the bottom if desired. In Fig. 1 part only of these strips is shown.

It will be understood that in Fig. 3 a broken section only of the glass globe is given with two pieces (F) shown fixed and one piece (G) on the extreme top. The woodwork can all be painted up artistically in art shades of paint or enamel. (209)

**A Special Large Design
next week for making
a realistic model
Diesel Tractor**

Add to your enjoyment this summer with HOLIDAY SEA FISHING

THE popular holiday period of summer is a good time for sea-fishing. Indeed, one could not choose a better month than August, when many fish come inshore, so the holiday-maker may catch them by angling either from the pier or from rocks or a boat.

A seaside holiday is more attractive if one takes a rod and some sea-fishing gear among the luggage. Marine fish are game and hard-fighting—you seldom get a blank day. They are of diverse species, and most can be fished for with rod and line.

Even if the hire of a boat and the services of a skilled boatman are too expensive, you can find plenty of sport fishing from the rocks or beach—fishing that is free to all. Also remember that from a quay wall, a harbour, or even a pleasure pier you may catch good fish and so add to your holiday joys.

Rock Fishing

Fishing from rocks is interesting. For this kind of sea-angling you can manage with your ordinary bottom-fishing rod. But you must be prepared for some hard going when scrambling over the rocks to reach the best stances. In some places, as Filey Brigg, in Yorkshire, good fun is enjoyed casting a fly for billet (coalfish), from the rocky ledges.

Fishing from the shore for bass is attractive. These grand sporty fish will come close in, and you need not be a specialist in long-distance casting. You can manage very well with an ordinary sea-rod and a wood reel of the Nottingham pattern. The best kind of line for the holiday-angler is of braided green flax with a breaking strain of 30lbs., and about 50yds. long. The lure is either an artificial spoon or a spinner tackle baited with a piece of fresh mackerel.

From the Pier

Pier fishing is, perhaps, the most popular form of sea-angling with the casual visitor, down for his annual fortnight. It is easy compared with rock or surf-fishing. It is handier, too, and saves a lot of effort in getting away to suitable spots at a distance.

Besides flat-fish, you may from the pier catch mackerel, whiting, codling, pollack, and conger, as well as various others. For pier-fishing a suitable outfit consists of a rod 8 to 10ft. in length with a 5in. reel carrying 80yds. of line. A useful tackle is the paternoster, with a lead at one end, and two hooks fastened at right angles to the trace, the lower hook being about 9ins. above the lead. 1ft. or so above this is the other hook. Do not have more than two hooks on your paternoster, as more hooks may only foul the weeds, etc., when you catch a fish.

The lead should be of the Grip

pattern when fishing on a sandy bottom, and of the Pyramid shape for a stony or rocky bed.

On the Hook

The hooks baited, the tackle should be lowered into the water, and when the lead touches bottom the line must be held tight. A jerk at the rod-top denotes a 'bite'. You can detect these easily enough by holding the line between the fingers of your left hand. On getting a tug, strike sharply, and play the hooked fish carefully, keeping your line taut all the time.

When angling from a high pier stronger tackle is needed, as you will have to lift your catch up a good way, and unless the tackle is strong a heavy fish might well break free. But it is always advisable to use as fine a tackle as you dare risk. Sea-fish can be shy! As to baits for pier-fishing, you may try such usual ones as ragworm, lugworm, sand eel, mussel, shrimps, and strips of fish.

Another method of angling from a pier is to use sliding float tackle, if the water is fairly shallow.

Paternostering

When paternostering from a pier it is necessary to be able to cast out your baited hooks 20 to 30yds. from the side or the pier-head. Practice will help. One method of casting is to draw off from the reel a quantity of line, with the lead hanging about 10ft. from the top of your rod; swing it out, and immediately the tackle touches water, let out more of the line, so that it is not dragged back, and the advantage of distance lost.

Some fish take almost any bait. For flat fishes, crabs without their shells and crushed soft are good bait; so, too, are strips of fresh herring. The latter bait also accounts for bass, conger, and whiting.

Suitable Bait

Ragworms are excellent baits for flounders and for nearly all kinds of sea-fish likely to come the way of the pier-fisher. You can buy them from the bait-merchants. Ragworms keep fresh in wet seaweed. Lugworms are also excellent baits for ground-feeding fish. But they are rather messy and unpleasant owing to the yellowish fluid they exude when handled. They attract whiting, pout and other sea-fish. If you cannot get 'rags' or 'lugs' try lobworms.

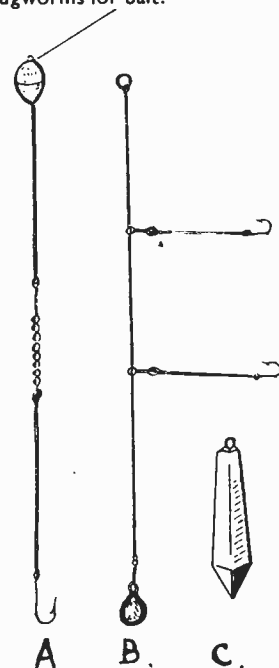
Sand-eels are good baits, and, perhaps, more suitable for such methods as trailing or spinning for bass, pollack, and mackerel; but they can be cut up for use as bait for the ground-feeding fish likely to be caught from the pier.

Pollack and Coalfish

No sea-fish is better known around our coasts than the coal-fish, *alias* saithe, billet, puddler, sillock, coalsey,

rock salmon, cuddie, etc. Coalfish attain a good size, the average being around 2lbs. to 3lbs. These fish are found in estuaries, on rocky coasts and headlands, also in sea locks. But they are also met with around piers, quays, and jetties, so that the holiday-fisher has a chance of getting them.

Fly-fishing with a white 'fly' made of gull feathers tied on an eyed hook is good fun. It can be practised from piers or rocks. Another method is spinning with an artificial sand-eel. Those who go afloat can try such methods as railing or whiffing, using ragworms and lugworms for bait.



Two-hook paternoster (B) a float tackle (A) and a pyramid lead (C)

Pollack much resemble coalfish in habits, and both fishes favour similar haunts. The bigger catches of pollack are made from a boat, though at times and in the right spots the shore-fisher also does well. Pollack are often taken by the method known as whiffing.

At Filey Brigg, Yorkshire, pollack are caught off the brig, and lots of mackerel, too, are taken by summer holiday anglers on the fly. Calm water is essential for the best results. There is plenty of scope for the sea-fisher round our coasts, for at most places there is fishing of some kind available.

Fishermen are naturally friendly people and you will soon find plenty to give you helpful advice. If you make enquiries before you go on holiday, there are probably fishers in your own town who will be pleased to tell you about the place you are visiting. (188)

Alternative styles for two modern NEWSPAPER STANDS

HERE are two designs for Newspaper or Magazine Stands, from which to make a choice. The homemaker, and especially the ardent fretworker, should surely welcome one of these designs to build for his home or as a gift for a birthday or perhaps as a very appropriate wedding gift.

There is a similarity in the two designs, although the character of the fretted parts are dissimilar. The size overall of the stands is, length 16ins., height 18ins. and width 8ins.

The illustrations in Fig. 1 give a good idea of the stands, and we will first describe that shown as (A). The two ends are of $\frac{3}{4}$ in. wood, and their outline can be drawn from the detail, Fig. 2. A plain oblong of wood is first cut measuring 18ins. by 8ins., and a centre line should first be drawn down its centre as shown.

Marking Out

On this line place the centre point for describing the arc for the curved top $6\frac{1}{2}$ ins. down. Then, on one side of the centre line set in the 1in. squares shown at the lower end and the top end of the oblong on the right. Through these carefully follow the curves to get the correct shaping of the foot of the stand, its heart-shape fret and the hand hold above.

When this is done, make a paper tracing of the outline and transfer it to the other side of the centre line by means of carbon paper. It would be as well if this drawing and outlining were done on paper first, so a permanent record for future use could be kept.

When the one end has been cut and cleaned up it should be laid on the board prepared for the other end of the stand.

With a sharp-pointed pencil draw all round the outline and the cut-out 'heart', and see that the finished line is distinct for cutting with the fretsaw.

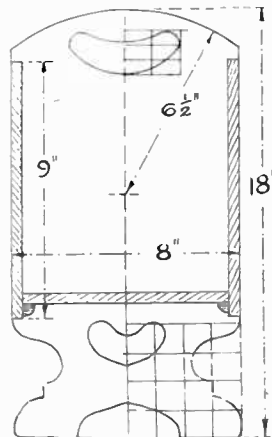


Fig. 2 — End view with dimensions

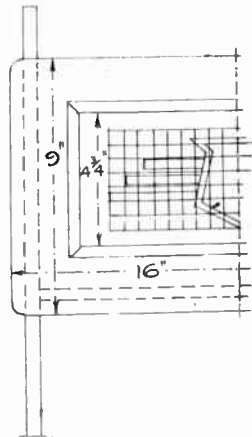


Fig. 3—Half front and end

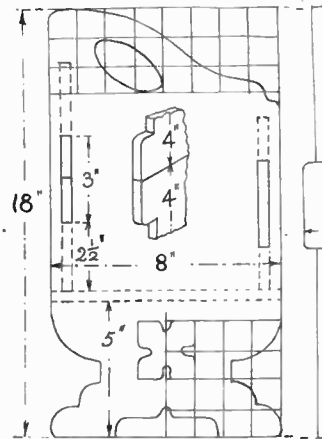


Fig. 4 — Squared alternative shape

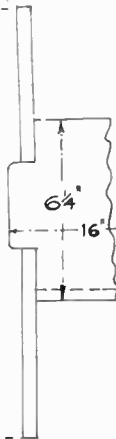


Fig. 5—Rail fitting

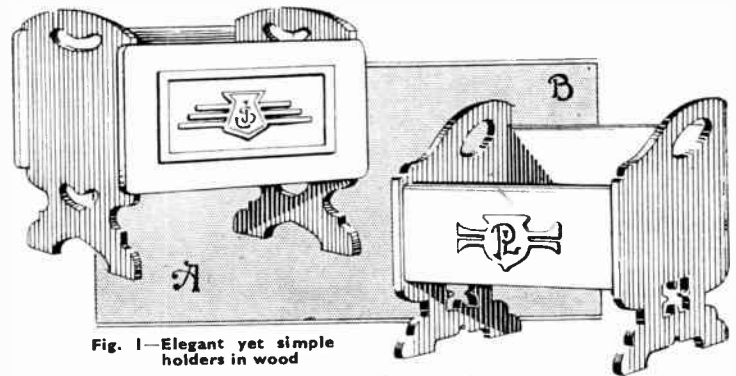


Fig. 1—Elegant yet simple holders in wood

The sides of the stand (see Fig. 2) are recessed into the upright edges of the ends. The sides are shown shaded in the diagram, and are let in $\frac{3}{8}$ in.—the full thickness and the width of the sides.

In Fig. 3 the half of one side is shown. It measures 16ins. by 9ins. and is, of course, $\frac{3}{8}$ in. thick. Cut the two carefully and round off the four corners and clean up. At a distance of $\frac{3}{8}$ in. in from the extreme ends of the panels make two countersunk holes and then screw them in, covering the heads of the screws afterwards with a filling composed of glue and sawdust mixed and levelled off.

A simple decorative panel may be added to one or both sides of the stand, as shown. The frame may consist of $\frac{1}{2}$ in. thick strips $\frac{3}{8}$ in. wide, mitred, glued and pinned on, while the interior fretted shield can be outlined and enlarged from the $\frac{3}{8}$ in. squared panel inside.

Floor and Support

For the floor of the stand a piece of $\frac{3}{8}$ in. wood measuring 14ins. by 7 $\frac{1}{4}$ ins. will be required. This is glued and screwed to the sides $\frac{1}{2}$ in. upwards from the lower edges of the side panels as seen in Fig. 3 by the dotted lines. The

heads of the screws will be filled as before suggested.

Underneath the floor, and in the angle with the sides, two strips of quarter-round or plain square beading should be glued to form additional strength to the stand.

Alternative Designs

The second Stand (B, in Fig. 1), is very much like the foregoing and therefore needs but very little explanation. The overall size of this stand is the same but the feet are of slightly different outline as is the tops of the ends. Two boards 18ins. by 8ins. will again be cut, and a number of 1in. squares lined in in two places as shown in Fig. 4.

The same method is adopted for the shaping and interior frets as previously explained. The back of this stand is higher than the front and is best made therefore in two widths of boards glued together. Two boards, each 16ins. long and 4ins. wide, are glued, jointed and tenoned. Then cut one at each end 1in. wide, as the inset detail shows in Fig. 4.

Care must be taken to set out the mortises correctly 3ins. long and $\frac{3}{8}$ in. wide for both the back and front panels as shown. Set out the position of the floor on each finished end of the stand before these mortises are drawn in; see measurements in Fig. 4.

The front board will be as Fig. 5 shows, portion only being given in conjunction with the end upright and the tenon. The floor measures 14ins. long by 8ins. wide by $\frac{3}{8}$ in. thick and is glued and screwed to the lower edges of the front and back panels. Screws could also be put through the ends into the floor if desired.

Make the whole construction strong to provide an attractive article.

The kitchen ceiling can be made to accommodate A CLOTHES AIRER

A CLOTHES airer for hanging in the kitchen is a boon to any housewife, particularly if a baby's nappies have to be dealt with. Making one is a very simple carpentry job, but remember that during the winter the airer may have to be used for drying clothes, and a full load of wet clothes is quite heavy.

The method of rigging is, therefore, very important, if the appliance is to be used without difficulty, and to do it properly the rope should be carefully knotted and spliced. Splicing is quite easy and the art is well worth knowing as it often comes in useful. A little practice is advisable, however, before tackling the airer.

A Useful Size

The actual size of the airer is a matter of choice. In the writer's own case it was made as big as could conveniently be used in the kitchenette. This was 8ft. in length and 1ft. 9½ins. in width to take five bars. If you consider three or four bars sufficient, the width can be reduced but the distance between bars should not be less than 4ins.

The end pieces (Fig. 1) are made of 6ins. by ½in. board or plywood as per drawing, and 1in. by ½in. laths for the rails. When planing these, remember to remove the sharp corners. A ½in. carpenter's bit is required for drilling the holes in the end pieces—one in each upper corner for the ropes and two close together for each rail.

The latter are cleaned out with a chisel afterwards to make each rail a sliding fit and then a wire nail is driven into each joint at an angle to make the whole thing rigid. The rails extend 6ins. beyond the end pieces and provide useful hanging space for small items.

A single and a double pulley block for

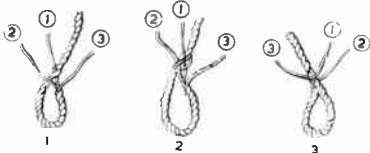


Fig. 2—Stages of making the eye splice

the ceiling can be purchased from an ironmonger, together with a cleat for the wall. The blocks must be screwed into a joist in the ceiling and this can be found by tapping the ceiling lightly. The parts which do not sound hollow should be the joists but to be quite sure probe gently with a sharp pricker and make sure you are going into solid timber.

The screws on the pulleys are long and a hole must be drilled into the joist to give them a start. If, with all this, you mark the ceiling, you can fill the dents later with a little Keene's cement.

The wall cleat should be secured in a position suitable for whoever is going to

use it most. 5ft. from the floor is usually satisfactory. If it has to be secured some distance away from the airer, another double pulley block may be required in the ceiling near the wall to keep the rope clear.

Good quality rope is essential to withstand constant wear on the pulleys and ¾in. to 1in. circumference is recom-

airer up as high as it will go, secure it and then cut the rope 6ins. below the mark. Unlay the ends as far as the piece of string and splice them into the other rope.

Although this is not an eye, the same kind of splice is used and when completed the two ropes are said to be married. Make sure that both ropes are taut and

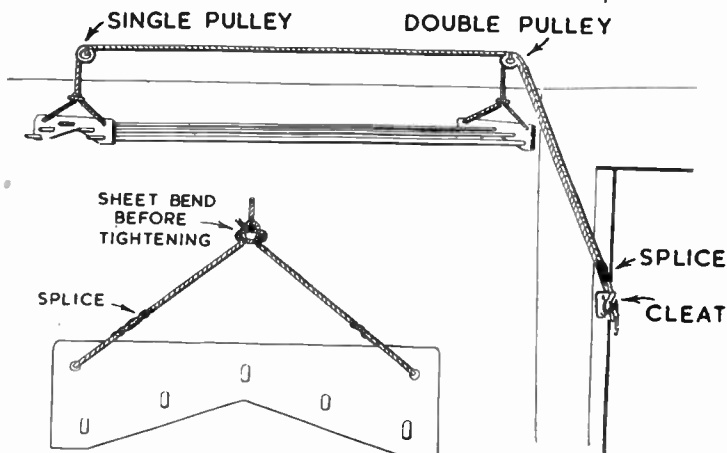


Fig. 1—A detail of shape of one end piece

mended. About 30ft. should be sufficient for an ordinary kitchen.

Now the airer is constructed and the pulley blocks and cleat are in position we can consider the rigging. Cut off two 3ft. 6in. lengths of rope for the end pieces and pass one end of each 9ins. through the holes provided. Next unlay the strands 6ins. at each end and make four eye splices as described below and as shown in the sketches.

The ends of the remainder of the rope have to go through the pulleys and they should be bound tightly with string first. This can be left on and will avoid the ends of the rope becoming frayed and unsightly later on. Reeve one end through the double pulley and then the single pulley and down to the floor. The other end goes through the double pulley only.

These ends are secured to the ropes on the airer by means of a sheet bend as shown in the drawing at Fig. 1. Form a loop in the exact centre of the rope on the airer, pass the end of the main rope through, round the back and then under itself at the front before pulling tight.

The Right Height

When the two ends of the main rope are secured, the airer can be hauled up and down to make sure it is working properly. The final step then is to secure the airer at the exact height the user would like to have it for normal use when hanging clothes. A distance of 3ft. 6ins. from the floor is a convenient height for most people. Now mark one of the ropes close to the double pulley by tying a piece of string tightly round it. Pull the

the airer level before commencing the splice.

When the splice is finished the airer can be lowered until the splice reaches the double pulley when it will be supported at the convenient height previously mentioned without any danger of slipping. There is no need to secure the rope to the cleat while loading the airer. Hauling up is done by means of one rope instead of two, and the airer must remain level.

An Eye Splice

Unlay the end of the rope at least 6ins. and after forming the size of eye required lay the three strands on the main part of the rope. Now tuck the centre strand under the strand nearest to it, as shown in Fig. 2. Pull through gently until strand No. 2 is snug against the rope. Next pass No. 2 over the strand which No. 1 went under and tuck it under the next, as in the detail No. 2 at Fig. 2. Finally, turn the rope over and tuck strand No. 3 under the third strand of the rope, as in No. 3.

This completes the first tuck and the splice is continued for 3½ tucks by tucking each strand over and under a strand of the rope twice more, plus the half tuck which is made by splitting each strand down the middle and tucking only half. Cut all ends off close to the rope and the splice is finished.

It is usually possible to lift the strands for tucking under by untwisting the rope between the fingers, but if this proves difficult a pricker or small spike can be used. (203)

Some practical hints by an expert about PHOTOGRAPHY IN JULY

WE have often wished it possible to collect a large crowd of holiday makers in a hall, the only terms of admission being that each should show a camera on passing the barrier. The main theme of the lecture would be something on the lines of Fifty Years Experience of Camera Work, What to Take and Errors to Avoid.

Such a meeting is not possible but as an alternative we can reach the amateur Photographers who are regular readers of *Hobbies Weekly* and as this is one of the holiday months, there is no reason why that so-called Lecture should not be put into print for their benefit and so prevent some disappointments.

Camera Groups

The talk must start with a note of warning concerning two very common errors responsible for a considerable number of spoiled films every season. It would, however, be very wrong to blame the photographer for all these. It has been the author's privilege to spend a great number of holidays with groups of people made up of a majority of camera users and this experience compels one to admit that the blame is due to other influences which are difficult to combat until the trouble has been clearly demonstrated.

Everyone of us is at times struck with the beautiful colours with which nature paints our English scenery. And as



A pleasing wave study

amateur photographers are always on the look-out for the beautiful, we naturally, are influenced to probably a greater extent than the non-photographer. It is, therefore, not surprising that we fall into the trap and make an exposure when, if we would only stop for a few seconds and try to imagine how that particular scene would look in 'black and white' we should certainly not take it.

Where colour dominates the scene there are one or two questions which must receive satisfactory answers before taking the decision to shoot or not to shoot. Will those colours influence the time of exposure? Are there any

objects of general interest to compensate the loss of colours when a black and white print is the only result? Is the composition or make-up of the view correct?

If your consideration of the subject on these lines fails to give you a satisfactory conclusion, then you will be wise to pass by and look for something else.

It is not generally realised what a tremendous influence colour has on our senses and although we have mentioned this experience before, yet it is worth repeating as illustrating what we are anxious to bring home to everyone.

Some few years ago while staying in the West of Scotland we were favoured one evening with a most gorgeous sunset, something which surpassed any previously seen by the guests of the party. Within a few minutes cameras were clicking everywhere and probably the number of exposures exceeded three or even four dozen.

Yet not one of them was any good! For two very obvious reasons; first the whole colouring of the scene ranged from orange to deep red, which are the lights in use in our darkrooms and are non-actinic; the second reason, that the light value at sunset is never powerful enough for snapshotting and most certainly on this occasion was hopeless.

Those amateurs really were not to blame. They were enthusiastic and wanted to take back something to remember the occasion. They could not help admiring the spectacle and its power affected and certainly influenced their better judgment. Undoubtedly, they had a keen disappointment.

Judging Distance

The second of the common errors relates to the taking of long distance views. In our rambles, hikes or coach trips we frequently stop to admire the view from the top of a hill. A glorious panorama is stretched out below and before us and our eyes can wander over ten or even twenty miles of almost uninterrupted country. The same experience applies to those of us who have enjoyed the pleasure of climbing a mountain. Here a change of this type of

scenery is constantly presenting itself, and if a camera is being carried, the thought is turned over as to whether to make an exposure or not.

Well, it is good to have the thought because we know that in the great majority of instances the decision will be to 'pass on'. But if you feel you would have a successful print then, of course, there is no reason to stop you taking.



A typical and topical beach subject

Realise, however, that you are trying to transfer a view with dimensions extending over many square miles to a small piece of film about 3½ ins. by 2½ ins.

It can only be satisfactory if you can place yourself in a position to ensure some prominent details or objects are included in the foreground and middle distance and thus using the extensive part of the view as a background to the picture. Without these details the result often appears as a collection of dots and dashes or conveys a very poor idea of a grand but huge landscape.

Colour Effect

We hope these warnings will be found helpful. It is not the intention to prevent you admiring nature's colourings, but to warn you not to be unduly influenced by them. We shall in due course have the beautiful autumnal tints and a spot of sunshine on these makes a great deal of difference, enabling many charming and really pictorial results to be achieved. The various shades of greens and browns help to produce tone values or gradations in the negative and print. Let us also remind you that you will probably find more satisfaction in taking small pieces of landscape than attempting the large and extensive views, beautiful though they be.

This last note seems to suggest that so far this article is largely composed of matter of a negative character and it is time that you were given something rather more positive and of help to you in selecting your 'bag' of holiday mementoes.

Holiday Snaps

What a lot this expression implies.

Even the word holiday recalls our memory but when 'Snaps' is added; well, we automatically dive for our pocket wallet to bring out that little batch of prints. Or, perhaps, you are much more methodical (we hope you are) and have got the prints nicely mounted in an album, with details under each. And possibly a record of the visit and circumstances relating to that day's excursion to an historic and interesting village close to where you were staying.

Some few weeks ago our interest received a very pleasant fillip. It was while going through a number of photographs, all very good technically. But there was one which, partly because of its originality but more from its historical interest, attracted attention and caused questions to be asked about it.

It was a print of a 'House Sign' the sort of illustrated name sign usually applied to public houses and village inns. This particular one did not belong to either, but was in the nature of a 'Trade-mark' of an old established firm in the City of London.

House Signs

Now we have all from time to time come across very interesting signs, some of which are interesting because of their excellent painting, their history or even because the name or picture is unique. Many large banking and insurance companies have their own particular signs and, again, many manufacturing firms throughout the country go to much expense in designing and producing specimens of their trade marks. So that when the 'locals' are included in this field of opportunities, it becomes very extensive and it seems to me that it offers something new for the amateur photographer.

Collections of Interest

It is curious how almost everyone is keen on collecting something or other, stamps, coins, snuff boxes, etc., etc. The collection of match box labels is a hobby that seems to be growing and surely if match box labels are worth collecting, then there must be much more value in collecting and exchanging photographs of Hotel, Public House, Village and other forms of Signs which occupy conspicuous places. In many instances, they are of public interest as representing and indicating direction points, bus stops, etc.

It is just possible that some of you might be asking what value such a collection might have. The answer is that, apart from the personal interest, it gains actual value as it gets older, because it is surprising how quickly places change, in these days old village inns become Country Clubs or palatial Road Houses in the twinkling of an eye; streets are widened to meet traffic needs and anything ancient becomes modern.

An Annual 'Best'

Having given you an idea for keeping a watch on small objects for a collection, consider quite a different type of work

with your camera and to start this year. During the holiday set your mind on getting at least one 'Best Picture of the Year'. Be extra careful in selecting and be sure it is pictorial. Put all you know about exposure, lighting and composition into the taking, and when the time comes for developing and printing, be on your toes to continue the same care.

Mounted Enlargement.

If you are satisfied with the result and can make an enlargement, do so, or have one made. Mount this in good style, and on the back of the mount write the details, including the date it was taken.

If you do not wish to frame it, then make yourself a portfolio in which to store it with others as they come along each year.

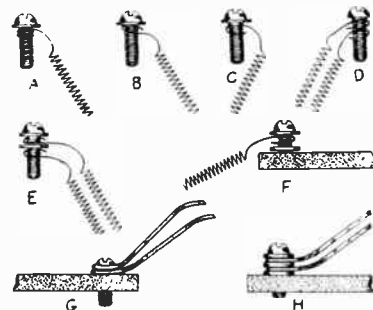
Improving Results

You will be surprisingly pleased and should be proud of the collection as it grows. The actual effect of this work will be seen in the improvement and general progress which it forces upon you. For, if it is your best effort, then it will be better than anything previously achieved by you, so your photography will be more successful with fewer failures.

The proper care in electrical spiral element TERMINAL CONNECTIONS

READERS who undertake the work of renewing a spiral element in an electric fire or boiling ring, should take particular care in making connection to the terminals. A badly-made terminal connection can cause much trouble, since any slight ill fit can result in arcing with a burn out at the connection.

One common cause of trouble is indicated in view (A) of the accompany-



ing illustrations. Here the end of the element is twisted round the terminal screw, with the result that when screwed down on the terminal bar the threads tend to cut or nick the element, with a resulting arc and burn out when current is switched on.

A Better Method

A better method of making the connection is indicated in (B) where the element is loosely looped round the screw under the washer in a clockwise direction. Making the connection in this way will tend to avoid nicking the element and thus prolonging its life.

If the element is looped in an anti-clockwise direction as indicated at (C) trouble may result in the end turning away under the washer when tightening the screw; so it is better to loop as at (B).

In the case of three heat control boiling ring elements, the ends of the two spirals which are connected to the common neutral bar should be given careful attention. One common method is to loop the ends together under the screw head, as indicated in view (D). This method has the disadvantage of causing the ends to spread out when the screw is driven home.

Washer Separation

A much better method is indicated at (E) where it will be seen the ends are separated by washers which prevent the ends of the element from spreading. When making connection to the terminal plate there are one or two points well worth considering. When an element burns at the contact point of the terminal plate, the arc thus formed is so intensely hot that it burns the surface of the bar. Any roughness of the bar should be smoothed off with a file before refixing the end of a new element.

In order to obtain a good seating for the element, loop the end between two washers before screwing down to the bar, as indicated in view (F). The same rules should be observed when making new connections of the current conductors in electric fires. Use a washer under the screw head, and remember to loop the end of the conductor round the screw in a clock-wise direction.

Mistakes to Avoid

Avoid the mistake in connecting two common conductors to the terminal bar, as indicated in view (G). It will be seen that in the absence of washers, the loops have spread, which allows the head of the screw to pass through without obtaining tight contact. A good contact is obtained by using three washers as clearly indicated in view (H), which will assure a sound connection.

(173)

Further instructions on how to erect a practical HOME-MADE GARAGE

LAST week we gave complete cutting list of material and the first stages for building this strong and economical piece of work. Now we can continue.

The nails used should be 1½ ins. round, and they should be spaced approximately 6 ins. apart. The side will now be covered with the exception of the strip above the window frame; this can be covered later with strips left over from the roof.

Covering the Rear Section

Lay the rear section on the floor and place in position the two 6ft. by 3ft. sheets, one each side of the doorway. Take up 6ft. by 4ft. sheet and place on two trestles or tea boxes of equal height. Mark off and saw the piece into two equal pieces 4ft. by 3ft. It is a good plan to saw 2 ins. or 3 ins. from one side then start at the other side and saw right through. This will avoid breaking the corner off when finishing. Take one of these pieces and draw a pencil line across the diagonal.

Now try the sheet in position, see Fig. 13. If the frame has been built correctly, there will be a strip of asbestos about ½ in. to spare. If necessary, mark to fit the frame and carefully saw. The piece left over should be sawn to fit the opposite triangular space. With the four pieces in position mark out and drill for nails. While the section is still on the floor, after the asbestos has been nailed in position, drill the four ½ in.

holes to take the ½ in. bolts which are to hold the sections together.

It is important that the holes in each section are drilled to a convenient set dimension, noting that the front section bottom rail lies 2 ins. lower than those of the other sections when assembled. This is to give a clear run in, the front section bottom rail being sunk in the floor.

Covering the Roof Sections

The four roof sections are identical in size and so is the covering, but care must be taken when fixing due to the overhang. The first thing to do is to saw the sheets ready for fitting. It should be noted that although the roof frames are 4ft. 9 ins. long, the asbestos is sawn 5ft. This gives a 3 in. overhang which is just right for the 3 in. guttering, after allowing for the thickness of roof board and the gutter bracket.

Each of the four sections will require one sheet 5ft. by 4ft. and one sheet 5ft. by 3ft. This means that a 12 in. strip will have to be cut from four sheets of 6ft. by 4ft. and from four sheets 6ft. by 3ft. Take each sheet in turn and support it on trestles, and saw off the spare strips, taking care not to break them, as they will be wanted later.

Asbestos Sections

As already mentioned, care must be taken when fixing the asbestos, the four sections must form a set. To make sure that everything is right, lay the four sections out on the floor just as they will

fit when in position on the roof. This means that the 3ft. and 4ft. spaces line up with those in the side sections. Next place the asbestos in position with the overhangs to the outside. The asbestos can then be marked out, drilled, and nailed in correct position.

Before drilling for the nails, it should be remembered that as the weather strips which cover the sheeting joints are only 2 ins. wide, it is important that the nail heads come well under the strips to prevent wet entering down the nails. With this in view, nails should be placed not more than ½ in. from the edges where the sheets meet. The nails used along the top and bottom of the sections should be special roof nails, having large flat heads, they should be galvanized, and 1 in. to 1½ ins. long.

Covering the Front Section

The front section being chiefly doors, requires very little asbestos for covering. The 4ft. by 3ft. piece left over from the rear section should be sawn down the diagonal after it has been tried in position on the frame. Fit the two triangular pieces in position, mark out and drill for the nails. Make secure, using 1½ in. round nails. The pieces left over from the roof can be used to fill in the 7½ in. spaces each side the door frame. If 3ft. strips are used these will make a

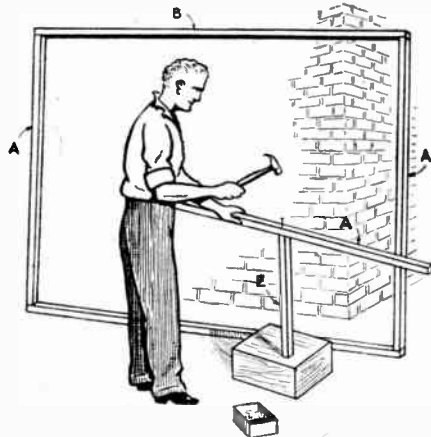


Fig. 10—First stage assembly rear section

Rear section—try the sheet in position before sawing

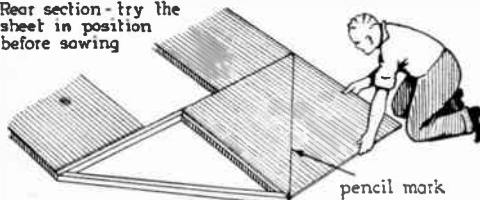


Fig. 13—Fitting the asbestos sheeting

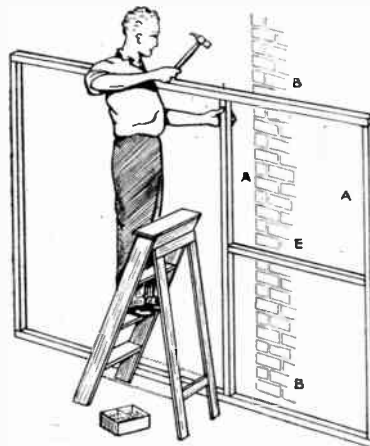


Fig. 11—Second stage rear section

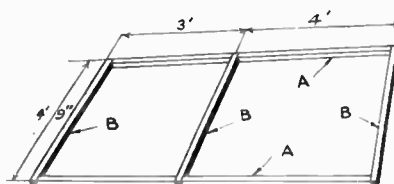


Fig. 12—Assembly of roof frame

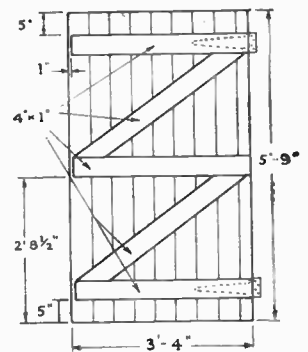


Fig. 14—The front door

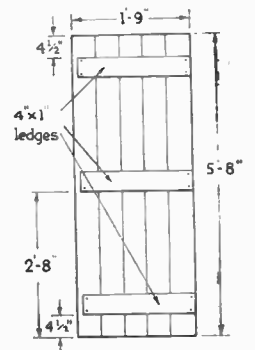


Fig. 15—The rear door

joint half way up the frame which can later be covered with weather stripping.

Finally, drill the four 1/4 in. holes for the bolts which hold the sections together, drilling them to match the holes in the side sections and not forgetting that the bottom rail of the front section is 2 ins. lower than the side sections.

Finishing the Side Sections

All that remains to finish covering, is

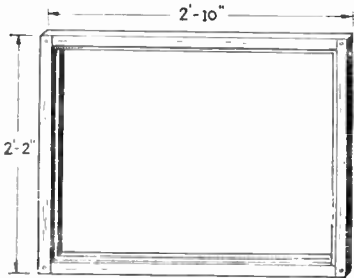
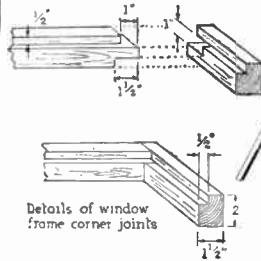


Fig. 16—Completed window frame with details



Details of window frame corner joints

The front doors are made of 5/8 in. tongued and grooved matching, 5 ins. wide. Asbestos panel doors can be made, but these soon get cracked if caught out in a gale. The bracing pieces are 4 in. by 1 in. planed battens. The layout and dimensions are shown in Fig. 14. A 6 ft. length of matching should be marked out for the rails or ledges. Nail the three ledges in position and

other matchings in position using two 1 1/2 in. oval nails in each end. The matchings should be held together with a clamp before nailing, or knocked together with a wooden block.

Trim the ends to give each door an overall length of 5 ft. 9 ins., making the bottom ledge 5 ins. from the bottom of the door. Add two screws to each end of the last matching to prevent the boards

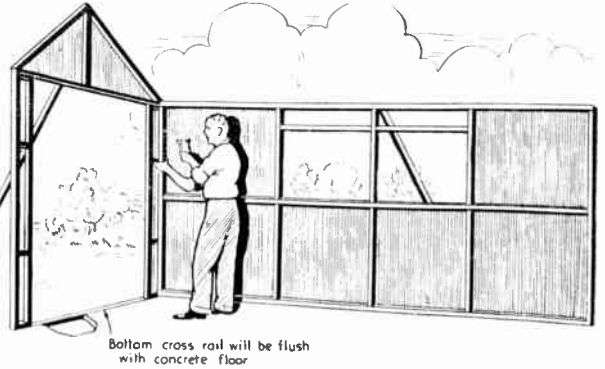


Fig. 17—The first stage in assembly and erection of the work

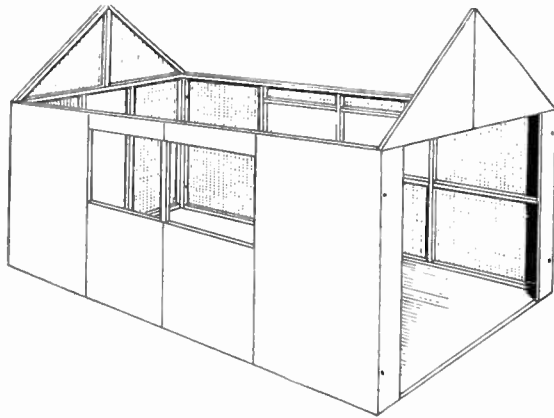


Fig. 18—The four sides assembled

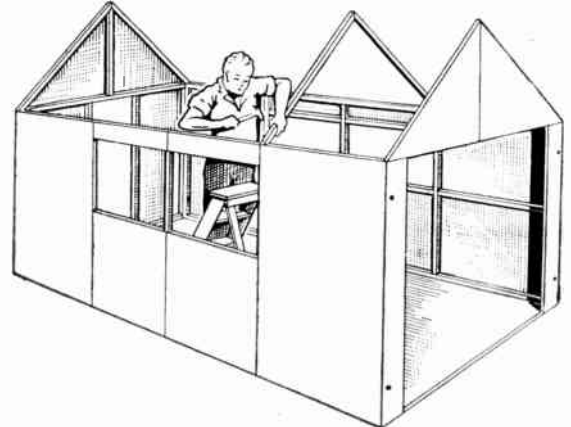


Fig. 19—Fixing the roof supports in place



Fig. 20—Screwing cross section supports

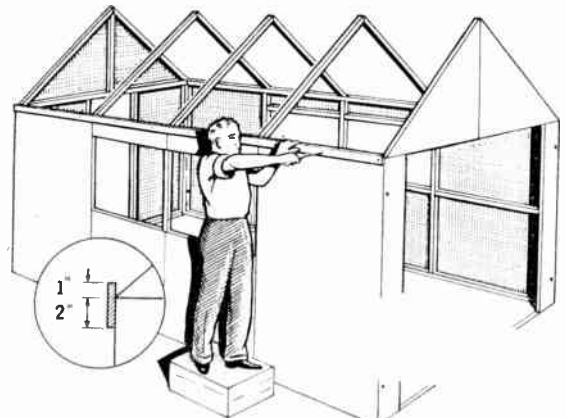


Fig. 21—The 14ft. boards fixed before the roof sections

to finish the side sections by covering the spaces over the windows. Four pieces will be required for the two sides all 3 ft. by 8 1/2 ins. These can be cut from the remaining strips left over from the roof. The asbestos covering is now complete and everything dealing with it can be cleared away.

perfectly square with the matching, using 1 1/2 in. nails (oval), two in each ledge. When it is assured that the ledges are perfectly square, drill each ledge to take 1 1/2 in. screws. Fit the screws and pull them dead tight so there is no chance of the ledges getting out of square. Nail the

opening when exposed to the weather. Place the bracing pieces in position and mark for sawing. The braces should be fitted to the doors to form a pair, that is in each case they should point down from the hinges.

(To be continued)



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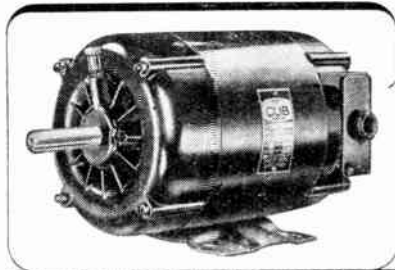
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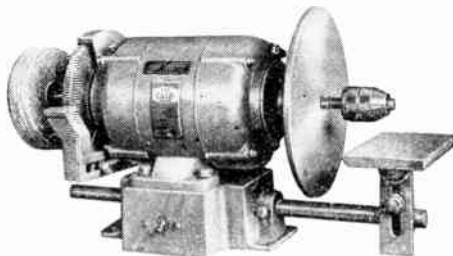
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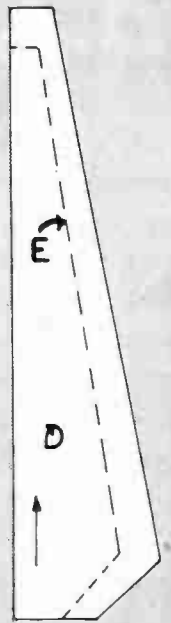
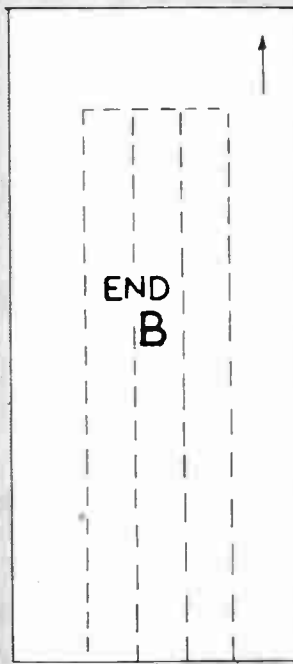
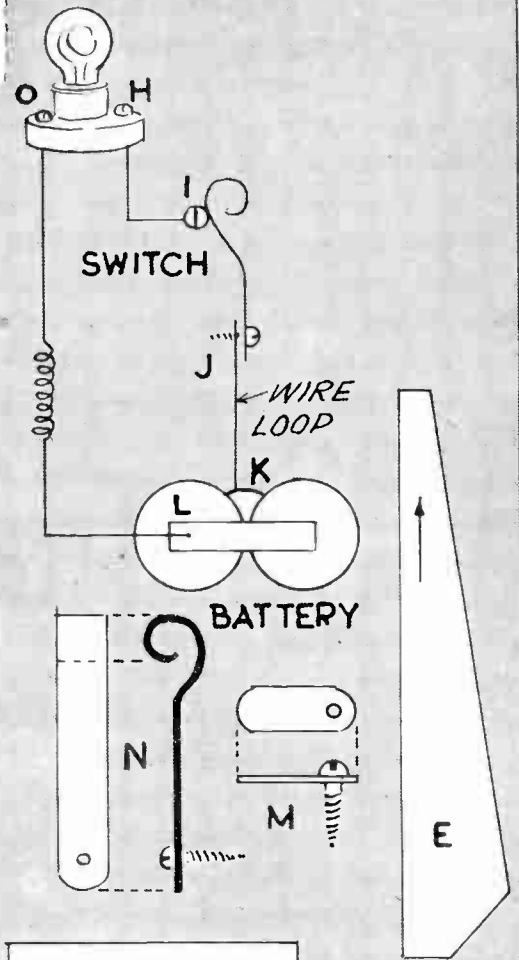
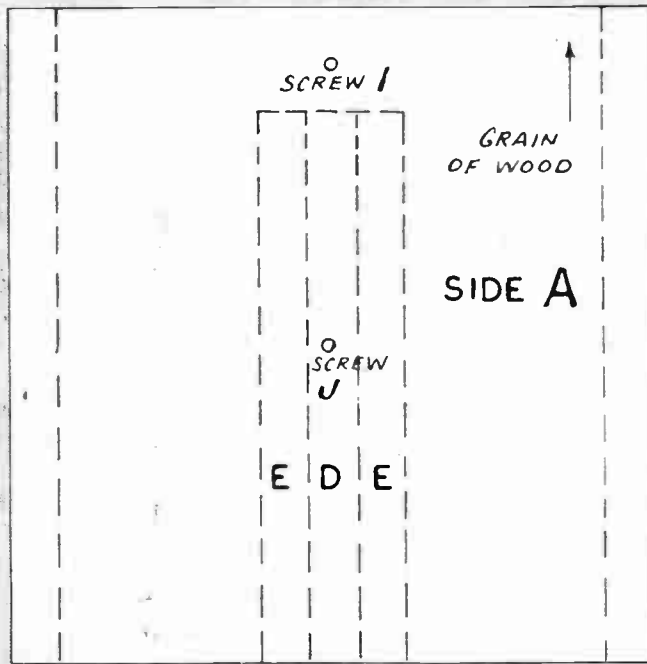
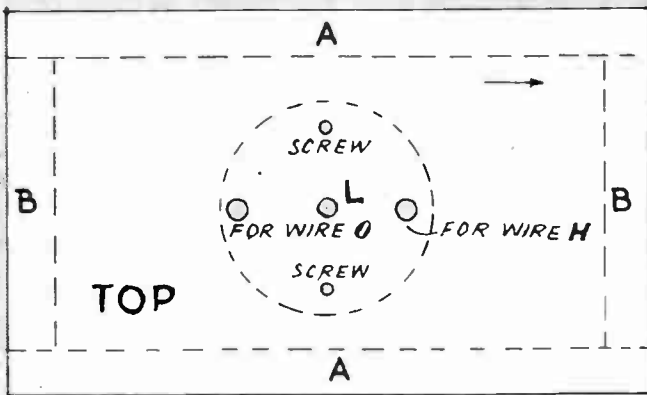
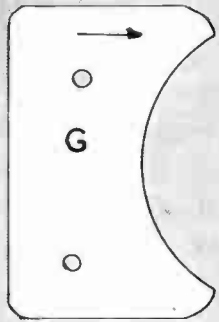
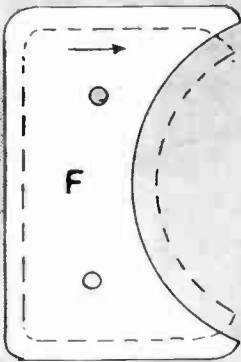
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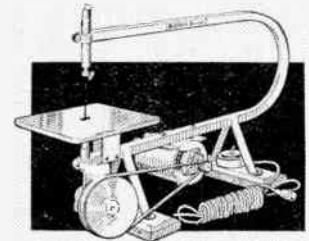
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How the handyman can make a strong GARDEN WHEELBARROW

A GOOD barrow is most essential for work in the garden or allotment, and as it is rather expensive to purchase, it is well worth the little trouble in making, if some suitable wood is available. The design shown is of a simple nature, in wood, avoiding the splayed sides which may prove difficult to the woodworking amateur. The barrow loses nothing in efficiency, though, and is a well-balanced article, capable of carrying as much weight as most readers will need, without undue strain.

Stout Timber Wanted

A side view of the barrow is given in Fig. 1. A good stout timber should be employed for making it, as most barrows

get a lot of hard work, not to mention some bumping over uneven ground, and have to stand all weathers. The body of the barrow should be made from wood, not less than $\frac{3}{4}$ in. thickness, elm if available, deal if nothing stronger can be got. However, a good hardwearing article can be made from the latter wood.

The Sides

The two sides are got out from a 9in. wide board. Cut to the length given, and from the top, trim the front end to 45 degrees, and the rear end to 60 degrees. Then cut down to 6ins. at the rear end. The end boards are shown at Fig. 2, one half of each only being given, to save space. These ends can be grooved into the sides, the grooves being $\frac{1}{2}$ in.

deep and spaced about $\frac{3}{4}$ in. in from the ends.

An alternative method of fixing, and a strong one, too, is to screw a $\frac{3}{4}$ in. square wood fillet to the ends of each side piece, and to screw or nail the barrow ends to these fillets instead of through the sides, as at (A) in Fig. 3.

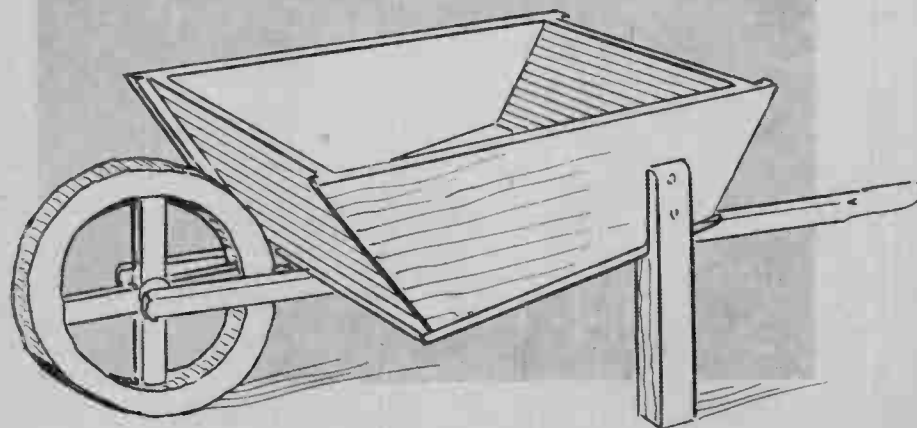
The screws should be well countersunk, ordinary iron ones being quite O.K. for the job. Having fitted the ends firmly, turn the barrow upside down and plane the under edges of the ends level with the sides, to allow the floor of the barrow to bed down flat.

The Floor

For the floor, use $\frac{3}{4}$ in. tongued and grooved boards, laying them lengthwise. Cut the boards long enough to extend beyond the ends $1\frac{1}{2}$ ins., and well nail them to the sides. Owing to the slope of the ends it will be as well to avoid nailing in the usual manner, as some skill is wanted to drive the nails in without them breaking through.

Instead, a strip of wood should be screwed to each end piece of the barrow, as at (B) in Fig. 3, and the floor boards screwed to the strips, making a strong fixing, which is specially needed at this part. This completes the body work.

A pair of long handle bars will be needed, these acting as bearings for the wheel also. Wood, some $1\frac{1}{2}$ ins. thick, or $1\frac{1}{4}$ ins. if you like, and 2ins.



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

wide, will suffice, and if oak or elm can be got, all the better. Cut these to the length given in Fig. 1. A few inches at the rear ends is reduced in size, and shaped up to form comfortable grips for the fingers. A good glasspapering here will help and adds greatly to ease in handling the article, especially when loaded to capacity.

Fix these handlebars to the underside of the barrow, with a single bolt to each, at the rear end. Allow the handle portions to extend beyond the rear end some 12ins., which will probably be

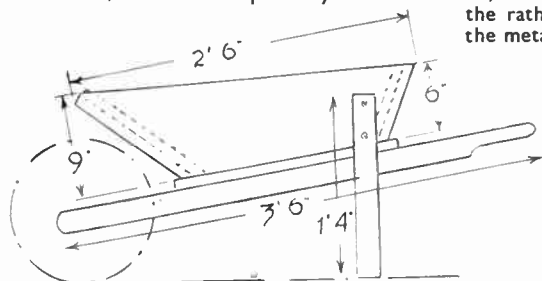


Fig. 1—Side view with dimensions of parts

sufficient to trundle the barrow without catching the knees.

The fore ends of the handlebars should now be separated enough to admit the wheel of the barrow between. So far as the wheel is concerned, readers may purchase one in cast metal, wood or of the tyre description, as the cost may suit their individual purses.

Economical readers may care to purchase a second-hand one, which can often be picked up cheaply enough. It should be 12ins. to 14ins. diameter, not larger. In most cases the axle will require metal bearings to turn in, and this can be met by cutting and fitting metal plates to the inside faces of the handlebars, at the fore end, as shown in Fig. 4 (C).

Iron or mild steel $\frac{1}{8}$ in. to $\frac{1}{4}$ in. will suffice, and most readers will be able to cut and drill these without assistance. However, some time will be saved where the rather tedious job of drilling the metal can be put out to some

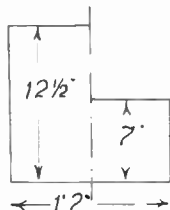


Fig. 2—Half shape of end boards

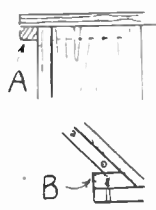


Fig. 3—Fixing methods

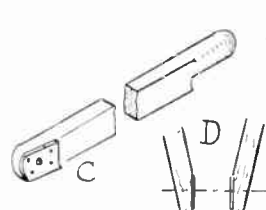


Fig. 4—Metal plate and angle at wheels

local metal worker.

A point to notice here is that owing to the angle the handlebars have to be fixed, the bearing faces for the wheel will not be parallel. This can be overcome. Cut sawing wedge shaped pieces off the bars, as at (D) to provide the parallel surfaces needed, a job, naturally, done before the bearing plates are fixed.

See the wheel is fitted centrally, and when right, fix a second bolt to each

WOOD REQUIRED
 Barrow sides— $\frac{1}{2}$ in. by 9in. board. 5ft. run.
 Barrow ends— $\frac{1}{2}$ in. by 9in. board. 3ft. 6ins. run.
 Handle bars—1 $\frac{1}{2}$ in. by 2in. wood. 7ft. run.
 Legs—1 $\frac{1}{2}$ in. by 2in. wood. 3ft. run.
 Floor— $\frac{1}{2}$ in. by 4 $\frac{1}{2}$ in. tongued and grooved board. 3ft. 6ins. run.

handlebar to secure them to the barrow. All that is needed now to complete the job is a pair of legs. Cut these from stout wood, say, 1 $\frac{1}{2}$ ins. by 2ins. stuff.

The legs should extend below the body of the barrow some 11ins., the remainder being reduced in thickness to 1in. where they are screwed to the barrow sides.

Give the completed article a coat of creosote or two coats of paint, as may be preferred covering every part to ensure it is weatherproof.

Readers should be conversant with these FACTS ABOUT TIMBER

WOOD for pleasure and profit can be looked upon by the model maker in two ways. Firstly, to what use can one put it, and secondly just what can be spared for the wife and the fire?

All wood can be of use to the wood-worker. The true craftsman is loth to part with even the smallest piece. One reason being the difficulty in getting just the right piece for the right job in these times of permits and restrictions.

Wood is classified in two groups; softwoods and hardwoods (coniferous and deciduous). Coniferous is the cone-bearing type or evergreens, and the deciduous the leaf-shedding type. Most coniferous trees are pine or fir trees, and are usually soft and easy to work, but have a sticky or gummy grain. A good method of identifying a soft, easy-working piece of wood is by its weight. If it is light and dry, it is a soft wood, but if heavy either wet or hard.

Soft woods such as Swiss pine and Scots fir weigh about 18 to 21lbs. per cubic foot. A few hardwood and their weights are as follows: Ash, approx. 30lbs. per cubic foot; Sweet Chestnut, 32lbs.; Japanese and American Oak, 45lbs.; English Oak 52lbs.; Honduras

Mahogany, 45lbs.; Spanish Mahogany 52lbs.

Here is a list of the most popular of woods used in model making. The ideal is yellow pine, a beautiful yellowish brown, soft and even in texture, hardly any grain, and seldom splitting in pinning thin pieces together, but has a tendency to warp.

Honduras mahogany is a light reddish brown wood with a streaky grain of hard and soft alternate bands running the length of the board. Care should be taken in selecting this wood, as lightning shakes are very frequent in it. Birch, Sycamore and White Chestnut are also very good woods, and are favoured by turners and wood carvers.

These three are fairly easy to work, but being white care must be used when gluing, as they are easily stained by water soluble glues.

Birch is sometimes favoured for model ship fittings, being very hard and close grained. In colour it is brown with an orange tint, tempting the modeller to leave it without paint.

One hears of models made from matchsticks, spills, and meat skewers, and even from orange boxes. Matchsticks, etc., are mostly from birch, whereas orange boxes may be anything

from pine to oak. One should take care if reduced to using orange boxes, for they are both hard and soft and play havoc with one's tools.

Balsa is, in the author's opinion, the most popular wood of the post-war era for all manner of modelling. It is a quick growing wood and is cultivated in Ecuador on something like rubber plantations. To give some idea of its growth, it can reach a height of 70ft., and 20ft. diameter in 10 years.

The advantage of this timber is that it embraces the full range of woods from soft to hard, there being 47 varieties and textures. The weight varies from 7lbs. to 45lbs. per cubic foot. This wood should be tried and will be found to be the ideal all round wood. It is creamy colour with a straight even grain. One might easily mistake it for the British wood poplar, but the weight should always be the deciding factor in the softer grades. Care should, nevertheless, be taken when selecting balsa for building models of 24ins. and over for, like all tropical woods, lightning shakes are frequent. (211)

Reprinted from *The Booklet Sheffield Ship Model Society*

Some suggestions and hints in forming and running A HOBBIES CLUB

THE middle of the summer may not seem the appropriate time to talk about Hobbies Clubs, which are, in the main, activities of the winter months so far as readers generally are concerned. The matter, however, must be raised now because it is really appropriate to think forward if the formation of one of these is to materialise by the autumn.

We are constantly referring to the advantages of co-operative work, and readers who are already members of such clubs, undoubtedly find added enthusiasm and interest by having others of a similar character and interest with whom they can discuss matters and work together. We would, therefore, recommend the idea seriously to those keen people who want to improve their ability, and at the same time enjoy their occupations and hobbies with others of a similar mind.

Other Enthusiasts

The formation of a Hobbies Club is a simple matter if you can get other enthusiasts to work together, but even so, it takes time. By formulating the idea now and letting the news get round, you should be able to have the club in being when the autumn season comes along with its darker evenings and added urge for indoor work.

The first thing, of course, is to find other kindred spirits, and then to go ahead with the other details which are necessary before the actual opening night, when you can get down to regular meetings and co-operative effort. Enthusiasm is the greatest virtue for all would-be workers, but there must be a leader in the effort.

Likely Contacts

First of all you have to make contact with others likely to be interested. This can be done by an advertisement possibly in a local paper, saying that a Hobbies Club is suggested and will those interested get in touch with a certain address? If you are a younger reader, you also have the approach through Youth movements, or Scout clubs, or the educational authorities, all of whom will probably be interested.

If you only have three or four potential members at the beginning, that is sufficient for a nucleus to discuss further details. Good news spreads quickly, and those four or five will gradually get it round and others come along. You can have the first meeting to discuss things, and to come down to brass tacks.

Place of Meeting

One is the place where the Club can be held, and there are several alternatives which are worth exploring. A parish hall or a small club room, or even the workshop of one of the members may be

available. The local branch of Toc H or Rotary would probably be of assistance in this respect, in being able to put you in touch with a likely rendezvous. The cost of the hall should not be great, but a rough idea of any required rent should be known, and a note of it made.

Hobbies to Cover

Then you have to consider what activities you are going to undertake, as this will materially affect the number of members likely to come along. You might even add to the woodworking side with the use of the fretsaw predominant in making models, toys, light furniture, pieces of fretwork, etc. You could extend it to incorporate carpentry and woodwork generally, with the idea of making home furniture or larger pieces of work.

Maybe, too, some of the members are interested in photography or model railways, model aeroplane making or stamp collecting. The question of athletics does not enter into it because these hobbies are more catered for already by existing clubs.

Bound up with this is the question of how often you are proposing to meet. It

may be that once a week will be sufficient at the beginning, but if you are proposing to include several of the hobbies mentioned, then possibly two or three evenings will be needed to meet the varied desires of the members. It is possibly unwise to allocate a whole evening to one subject, but rather to get variety by splitting up the programme as far as possible.

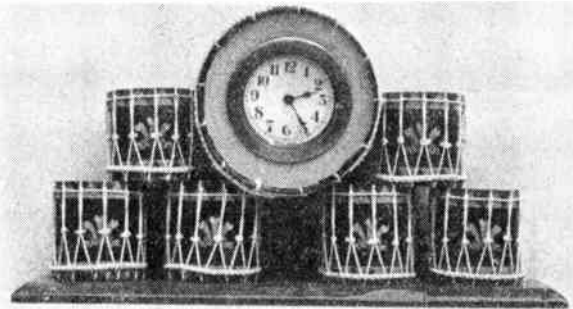
A General Meeting

Each member should be thoroughly interested in the project, but at the same time you will need an outstanding leader who will have tact and patience and the ability to handle with decision, the many questions which are likely to arise. Wrapped up with all these matters is the question of finance, and the success or failure of the club will largely depend on this matter. Consideration of the points previously mentioned will bring out the likely cost, and a rough idea of this must be in hand before you can commence.

The best plan is to call a general meeting of the active members first, in order to go into this question of finance, and to arrange something like a con-

A Novel "Drum" Clock—

***T**HE photograph below is of a decided novelty, and one which other readers may care to copy. The clock holder was made by a 64-year-old reader, Mr. L. A. Hobbs of Northcote Road, Deal, who is still actively interested in our pages and the fretsaw. Only odds and ends were used—aluminium from an old saucepan, 'Prince of Wales's Feathers' from tobacco wrappers, white fishing line to form the braid tightening cords, etc. The actual drums are 1 3/4 in. lengths of 1 3/4 in. diameter cornice pole, and the larger drum 3 1/2 ins. diameter bored for the clock barrel. Aluminium strip 1/2 in. wide formed loops for the drums, and a 1 3/4 ins. long strip holds each of the two lower ones apart, and supports the one above, when screwed on. Screws through the baseboard hold the lower ones. Colouring is half yellow and half red, and the whole thing forms an attractive, original and unusual piece of work. The clock movement, by the way, was bought from Hobbies Ltd. 29 years ago—and still keeps time!*



stitution of the club. In calling a meeting, you may send out preliminary letters to those people who have applied, and also to any of their friends, or to other individuals who are likely to be at all interested.

First Meeting

The first meeting could well be arranged in the home of one of the enthusiasts and all those who come should be introduced to each other to incorporate a general feeling of friendliness camaraderie to start with. You can then get somebody to act temporarily as secretary in order to make a note of the proceedings. The interest of each individual should be put down, and a general discussion allowed with a note made of the result regarding time of meeting, place of meeting, general club interests, etc.

Subscriptions and Costs

The question of cost will have to be threshed out in order to fix a subscription to be paid weekly or monthly. This subscription must be sufficient to cover the general expenses such as rent, lighting, heating, postages, note-paper, etc., and although this may seem to mount up in the first instance, much of it will not occur again, and so can be spread over a considerable period. It must be definitely arranged for the collection of the subscriptions, the payment of which regularly, is essential.

Do not let the meeting hang about too long, but cover the points required with speed and decision. If there are only a few of you, then the matter can be talked over quite easily. If the meeting is larger and the membership likely to number more than a dozen, then a good plan is to appoint the usual officers to run the whole thing properly.

The Officers

There should be a secretary, treasurer, chairman, and possibly a subscription secretary if thought necessary. The duty of the secretary, of course, is to deal with the executive side and definitely to keep a book with the minutes of the meetings held. These minutes need only be quite short, but should give the definite facts which are arrived at after discussion. The details of the discussion itself do not matter, but the subject should be dealt with in the minutes by saying that such and such a thing was decided upon.

The secretary will also be responsible for notifying members of meetings, if they are not being held regularly, and also arranging programmes and general particulars.

The treasurer will be responsible for the financial side, and should certainly keep a definite cash book to show what money is received and exactly how it is spent. A list of the members is also kept in a book where subscriptions are entered when paid. If columns are ruled for each week or month, a space is available to mark them off against the name of each one as he pays. The lump sum of the subscriptions can then be

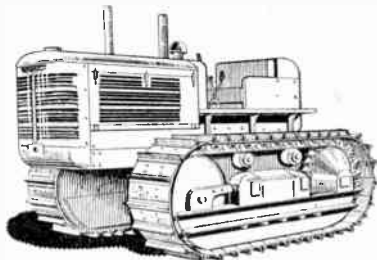
entered into the main book of the treasurer.

Associate Members

A suitable source of income is made sometimes by making interested people Associate Members. They are the ones who are sufficiently interested to pay, say, an annual subscription for the good of the club generally, but who may not

Our Supplement Design for a small model DIESEL TRACTOR

THIS realistic exhibition model of a large haulage tractor is 9ins. long and 6ins. high—built quite readily from the extra large pattern sheet with this issue. A complete kit of materials (No. 243 Special) is obtainable from Hobbies Branches for 7/4 or, by post from Hobbies Ltd., Dereham, Norfolk, for 8/1. A list of the addresses of Branches is given on page 270 of this issue. Or of stockists in most towns.



take more than a nominal interest, and will not take an active part. Possibly some shopkeepers or firms whose interest is in hobby work and materials, may like to become this type of member.

Rules of the Club

A few rules should be drawn up at the first meeting, and although these can be added from time to time, they should be as comprehensive as possible first. If you can go to the expense, it is as well to have these rules printed on a little card, with the name of the club and the address of the secretary.

The rules will cover the name of the club, the objects for which it is formed, the range of its membership, mentioning age and interest, the question of associate members, the date and time of regular meetings, the subscription cost, etc. A note should definitely be made that members will cease to belong to the club when their subscription falls in arrears of, say, six months. It may also be advisable to mention in these rules that the annual meeting will be held during a certain month. This is when the question of alterations and policy decisions can be taken.

If you have a wide range of interests, then it may be worth forming a small committee which will meet apart from club nights, to talk over incidental matters, suggestions, etc., which may arise. Names for this committee should be voted by other members generally, with a view to their knowledge and enthusiasm.

The question of temperament enters into this, in so far that a garrulous member of the committee may take up too much time in talking, or a member may be too keen about his individual interest for the general good of the club. Here again, a tactful and decisive chairman is a great asset. A good leader can hold together a committee and the members with a little tact, and so ensure the smooth running of the whole.

Publicity

Members should all agree to give as much publicity to the club as they can, because it is only by spreading the news of its activities and interests that other likely members can learn about it and come along. The various officers in every case should be chosen for their ability, and for the good qualities of mixing and handling with the other people.

It should, too, be impressed on them all, the need for regularity of attendance and subscription payment, their willingness to help in a general co-operative effort, and their enthusiasm to keep the club to a high standard without quarrels or petty disputes.

When the club is in being, the continued interest of all members must be maintained by a variety of activities, by the general co-operative effort of all of them, and the feeling that they are helping each other as well as themselves. The selfish individual who wants to do one particular job, or to be a more outstanding member than others, should learn to spread his ability over a number of jobs, and to row in with the others for the general good and advancement of the whole club.

Draw Up a Programme

For this reason, a definite programme should be drawn up so if a fellow feels a little uninterested in next week's work, he may realise that, perhaps, the week after there is something on in which he can really revel.

On the other hand, the programme must not be too hard and fast, and each night the club meets, there should be an opportunity of general relaxation for discussion or raising of new ideas or suggestions for something to be done of a different character.

Apart from the actual work in hand, the club may be able to undertake visits to works of firms or places of interest which will help to maintain the enthusiasm and offset the regularity of the meetings.

These can usually be arranged, if you write courteously to the Publicity Dept. asking them to state a convenient time. Do not forget, however, that factories do not usually run in the evening so a day visit is better if possible.

(To be Continued)

An interesting simple microphonic experiment to increase SOUND AMPLIFICATION

HAVE you ever heard a fly walking? If not, here is a simple electrical gadget that will enable you to do so—if you can persuade a fly to take a constitutional over the desired place on the instrument. The ticking of a watch will sound like a shipbuilder's yard in full swing, and the tapping of a finger like a steam hammer at work.

Early Microphones

It is by no means a new idea, for it was devised by Professor Hughes in the early days of telephony to demonstrate the microphonic effect of electrically conducting materials in loose contact with each other. It is, in fact, an extension of his classical 'Three Nails' experiment, shown in Fig. 1:

The device, known as the Hughes carbon microphone, is the forerunner of the carbon microphone as we know it today, and is extremely sensitive to even the smallest noise and vibration.

So sensitive, in fact, that it is quite useless as a commercial proposition, for obviously it cannot be handled in the same way as can an ordinary microphone. Nevertheless, it has uses apart from the purely entertaining, and is quite a valuable piece of test equipment in the amateur watch repairer's workshop.

Construction

First of all we require three carbon rods, and those from an exhausted dry battery will be quite suitable. Two of them are kept intact together with the

two rods have a small depression drilled near the ends remote from the brass cap, as in Fig. 3.

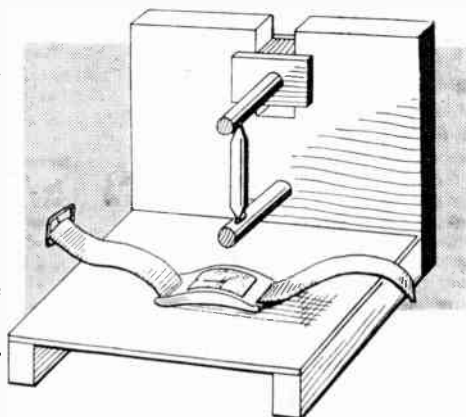
This operation is more easily accomplished if a slight flat is first filed on to the rod before drilling. The drill size is not critical nor is the depth of the depression, and the size required can easily be judged from the size of rods to be used.

The Sounding Board

We can now proceed with the sounding board. Since readers will be using rods that are to hand and which will vary in size depending on the size of battery from which they were taken, it is not possible to give exact dimensions; but the general requirements will be easily seen from the drawings.

A piece of plywood about 4ins. square is required for the base and two pieces of wood 1in. by $\frac{1}{2}$ in. by 4ins. act as side supports. These may be pinned or glued into position. A stout piece of wood about $\frac{1}{2}$ in. thick is chosen for the back support, and after it has been cut to suit the base it is prepared, as shown in Fig. 4. Its height should be such that the portion projecting above the base—(X) in Fig. 4—is about 2ins. greater than the length of the sharpened rod.

The first step is to hold it against the base in the position that it will finally occupy, and draw a pencil line along its length where base and back meet. This line is used as a reference for marking the hole and slot.



From this point measure $\frac{1}{2}$ in. down which represents the depth of the slot from the top of the back support. Now mark out the slot about 1in. wide in the centre of the support, and saw down the pencil lines, using as fine a sawblade as possible. Remove this portion by gently tapping at the bottom of the slot with a chisel, but do not throw it away—part of it is required for the next operation.

Easy Movement

From this, cut a piece about 1in. long, so making a rough square. Try it in the slot to ensure that it can be moved from top to bottom without fouling the sides at any point.

Two pieces of thin plywood $1\frac{1}{2}$ ins. by 1in. are now glued to it to form flanges (Fig. 5), thus forming a bobbin shaped piece which can be moved up and down in the slot. Before gluing, hold the pieces together in the fingers and ensure that the flanges grip each side of the slot, for it is necessary that this piece should stay put in any position to which it is moved. If it is too slack, rasp a little off the thickness and try again.

When the glue has set, drill a hole from one side to the other, using the same drill that was used for the carbon hole in the back support, and make sure that the other carbon is a tight push fit in it.

The back plate can now be pinned or glued to the base-board. One unsharpened carbon is pushed into the lower hole so that it protrudes about $\frac{1}{2}$ in. beyond the wood with the depression

uppermost, and the bobbin-shaped piece carrying the other carbon is pushed into the slot with the carbon depression downwards. The sharpened carbon is now placed between the two, with each end resting in each of the depressions. It should be held quite loosely and the rods adjusted so it is quite vertical with respect to the back support.

(Continued foot of page 262)

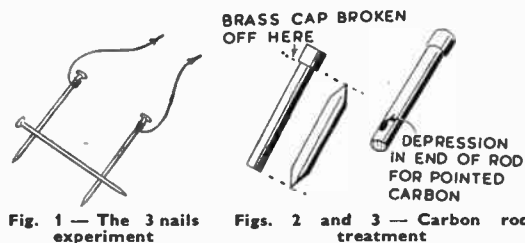


Fig. 1—The 3 nails Figs. 2 and 3—Carbon rod treatment

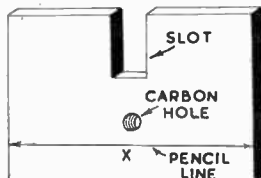


Fig. 4—The back support

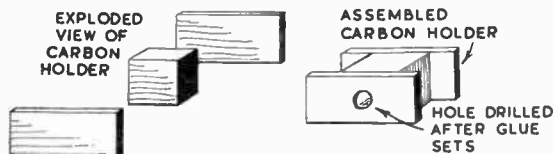


Fig. 5—Details of the carbon holder

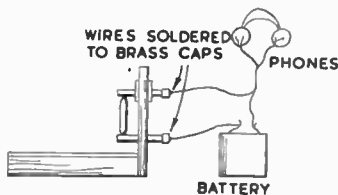


Fig. 6—Battery and phones added

brass caps on the ends, but the third has the brass cap removed. To do this it may be necessary to break off that part of the rod to which the cap is attached, thus shortening it slightly. However, the reduction in length is of no consequence.

This latter rod is now carefully sharpened with a file to a pencil point at each end, as shown in Fig. 2. The other

About $\frac{3}{4}$ in. above the line and in the centre of the plate, drill a hole of such a size that the carbon rod is a fairly tight fit. Push one unsharpened carbon through the hole so the depression just shows on the other side of the wood. Holding the sharpened carbon vertically with one end resting in the depression, mark the approximate height of the other sharpened end on to the wood.

Save worry and prevent children's accidents by MAKING BABY BARRIERS

THERE is a theory of course that it is a bad thing to keep young infants from crawling at their whim, but failing a nurse to superintend constantly, it is much safer to make a barrier or two and perhaps save a serious stair fall or other accident.

There are several ways of making barriers. One way is to buy a sheet of three-ply and with the aid of slots made of beading at the side of a doorway fix the sheet to slide into position. But the sheet will need a stiffening piece of wood at its top, and is rather heavy and unlovely to look at.

Dowel and Rails

The type of barrier described in this article is much lighter and less displeasing to the eye than the sheet type. The baby

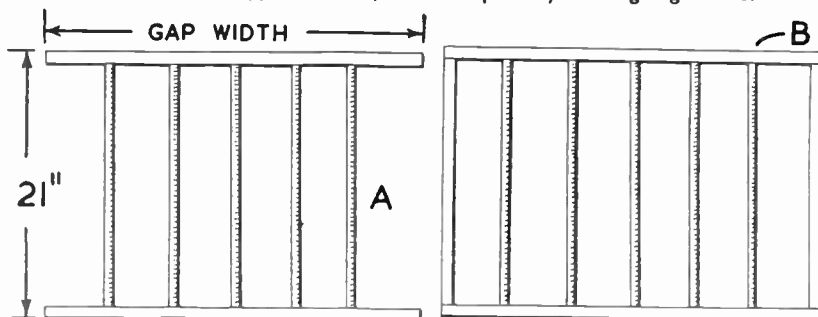


Fig. 1—An ordinary barrier (A) and a suitable stairway gate (B)

can look past it when it sits down on its own side to watch what is going on in the most desirable forbidden territory.

Three barriers such as shown in Fig. 1, made of $\frac{3}{4}$ in. dowel rod and 1 in. by $\frac{3}{4}$ in. batten cost just under eight shillings, with an extra shilling for 6 ft. of quarter-round beading as side fixings. You will probably find that the shop sells lengths of dowel rod ready cut, and for these gates 2 ft. lengths are ample. For ease of stepping over for a person of average height, the gates should not exceed a total height of 21 ins., making it necessary to trim down pre-cut dowel rod to about 20 ins.

Each gate will take five rods and exactly double the width of gap of top and bottom wood, as well as 2 ft. of beading for fixing. When you get the

wood start by trimming with a bench hook and tenon saw the lengths of dowel. Make each about $\frac{1}{4}$ in. shorter than the total overall height of the finished barrier.

Next plane up the 1 in. by $\frac{3}{4}$ in. wood and carefully mark square. Cut lengths about $\frac{1}{4}$ in. less than the gap into which the barrier is to go. Divide each length into six on the wider side, which will leave five equally-spaced marks for holes along the middle into which the dowel rod is to fit.

These holes are of the same diameter as the rod itself and should go to such a depth into the wood that the point of the wood drill just fails to show on the opposite side (see Fig. 2 C). Perhaps it would be as well to practice on a spare bit of wood before boring a hole in one of the pieces you are going to use.

of the gate would be necessary to ensure that the top did not disengage with less than a lift of the gate height, and this long lift is quite unnecessary. Incidentally, it may be possible to make one gate suffice for several places if the widths happen to be the same.

Stair Gates

A gate at the bottom of a stair may be less easy to fix unless it has sides as shown in Fig. 1 (B). The sides can be added after the dowel rod-type of gate is finished. But a more workmanlike job can be made by making a tongue-and-groove joint at each corner as shown, before the gate is first assembled.

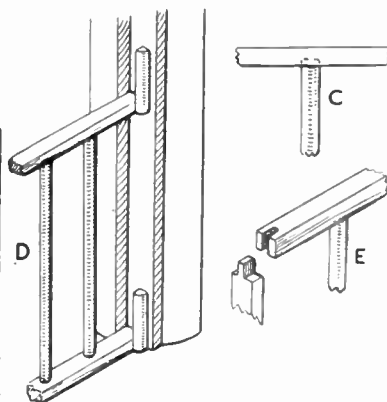


Fig. 2—Fixing socket and joints

Glue the dowel rods into the holes and along the bottom of the gate put a panel pin through the wood into the dowel ends. Let the gate stay overnight in the position it is to occupy—the glue will then stiffen with each rod at exactly the right angle for the gate to fit well. If necessary panel pins can also be put along the top of the gate—but the gate should be strong enough without them.

Drop Sockets

Cut the beading for sockets into 6 in. lengths, then with thin panel pins of about 1 in. length, tack the beading as shown in Fig. 2 (D). The advantage of having short pieces of the length given is that the gate can be disengaged after raising only 6 ins. A longer strip of beading running up to double the height

The joints should be strengthened with a panel pin put through sideways when gluing up is carried out. Afterwards, when the glue has had time to set hard the corners can be trimmed with a chisel and plane, being careful to plane inwards from the corner in each case.

The edge piece will then enable the barrier to fit into any system of beading slots tacked with panel pins to the side wood of the stairs. The advantage of using thin pins is that when the baby no longer needs to be kept from climbing stairs, or going past various points on its own, the beading can be gently prised away—leaving only almost invisible pin-holes to mark the place where the beading was once fixed. The finished gates can be stained or painted as desired. (192)

Sound Amplification—(Continued from page 261)

All that remains now is to connect up the battery—a flashlamp battery will do—with earphones as shown in Fig. 6, and adjust for best results. The connecting wires to the rods may be soldered to the brass caps.

To adjust the instrument, lay a watch on the sounding board and move the piece carrying the top carbon rod so that the sharpened carbon is very loosely held. Don the earphones. It is not advisable to have the earpieces right

over the ears when these initial adjustments are being carried out, because the microphone gives out some shattering noises at first.

Tap the movable carbon holder very gently downwards and listen after each tap. At first, nothing will be heard except the explosive bursts caused by the disturbed carbons. But very soon a point will be reached where the sound of the watch comes through clear and powerful—the sledge hammer tick, the twang of

the hairspring and the various other noises caused by the moving parts.

The instrument is now in a state of true microphony and when this point is reached, the movable piece can be fixed in position with a spot of glue. If a fly should now alight on the vertical rod the sound of its movements will be clearly audible in the earphones.

Finally, when the instrument is not in use disconnect the battery or it will become exhausted. (195)

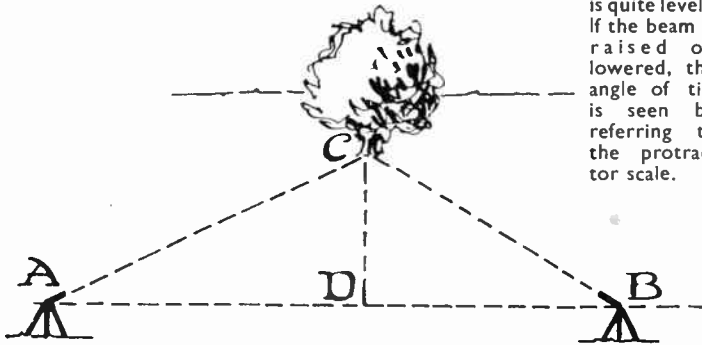
There is much interest resulting from making A SIMPLE THEODOLITE

THE simple theodolite described here is obviously not designed to compete with the very expensive professional models, but if well made and carefully used it gives good results, and is useful for teaching simple surveying

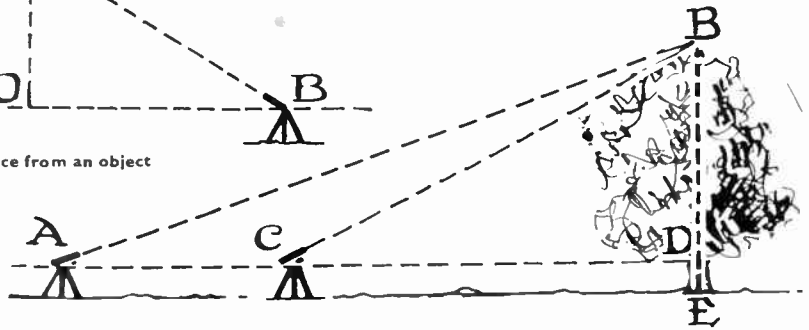
This beam is also fitted with a protractor and a plumb-bob, the thread of which shows through an opening in one of the supports. When the beam is perfectly horizontal, the thread lies against the 90 degree mark on the protractor (assuming the lower table is quite level). If the beam is raised or lowered, the angle of tilt is seen by referring to the protractor scale.

up the instrument at A, any convenient distance away, and sight the top of the tree B through the sights of the beam. We note the angle BAD.

Then we move the instrument to C, measuring the distance AC, with the instrument set up perfectly level and at the same height as before. We take the angle BCD. With this data we can work out the height of a tree (or rather the height of the tree above the line ACD). As we cannot take it for granted that every reader will know any trigonometry, the problem may be worked out by making a scale drawing, and scaling off.



How to find the distance from an object



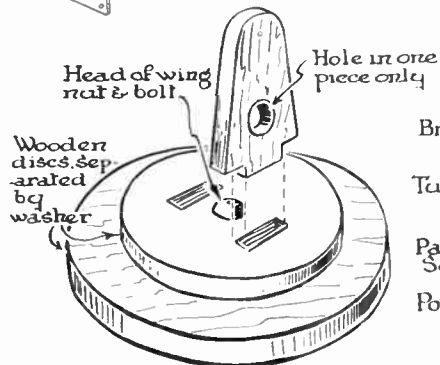
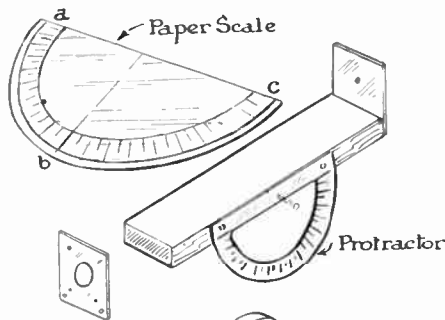
How to find the height of a tree or building

at schools, etc. The model forms a useful Scout project, is soon made from odd pieces of hardwood, and repays the work involved by the pleasure it provides. You do not have to be a maths wizard to be able to use it.

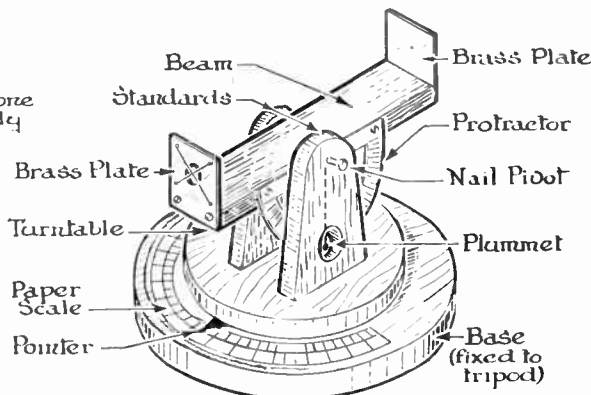
Essentially, the theodolite is an instrument for measuring angles, both horizontal and vertical. The lower circular base is rigid, and is fitted to a tripod. On this table another circular plate revolves. It bears two supports to take a swinging beam, bearing sights at each end.

Much in the same way the lower base is fitted with a scale of angles, zero (b in the sketch) being in line with the beam above. If the beam, and consequently the whole upper turntable, is moved horizontally round, the angular amount of turn towards A or C is shown on the lower scale by the pointer fixed to the turntable.

In the foregoing, the top of the tree is not necessarily vertically above the centre of the trunk at D, and the angle BDC not necessarily a right angle. In the case of a flagstaff, etc., where the angle BDC is a right angle, only one sighting is necessary, and it may be as well to make a start on such a simple problem.



The various parts in the construction of the instrument



Finding Heights

Reference to the main drawings will make the foregoing clear, whilst in the smaller diagrams we see how the instrument is used in actual practice. Suppose we wish to find the height of a tree. We set

For Distances

The horizontal scale is used to find out how far away any conspicuous object is. In the drawing, a base line ADB is measured, and sights taken from the ends to the tree trunk C. An accurate scale drawing may then be made and the distance CD scaled off. Other problems, such as finding the width of a river, etc., will suggest themselves, whilst such work affords a good introduction to the study of how land is surveyed for map reading.

The bulk of the article has been taken up by a description of how the instrument is used, for the reason that when

(Continued foot of page 265)

Simple practical additions which make for HOME IMPROVEMENTS

A CLOTHES stand in the bedroom is a good idea because not only does it air the clothes used during the day but it can also be useful when the wardrobe is full. It may be handy when you have visitors staying in the house; it is also a good plan to teach children to be tidy.

A Clothes Stand

First take a piece of board to measure 15ins. by 18ins. and find two well sanded broom handles for the uprights. You will have to cut these to the required height. Screw these uprights to the board as shown in Fig. 1. Fix them so you can fit a coat-hanger on the top. You can cut the handles so the hanger slots in or just screw it down, depending on the thickness of the hanger.

Two cross struts, made from $\frac{1}{2}$ in. dowelling will be placed at top and bottom, as shown. Adjust these to suit your own taste and allow for skirts or trousers. A safe height above base board should be about 4ins. Stain the base and provide a square of cork for

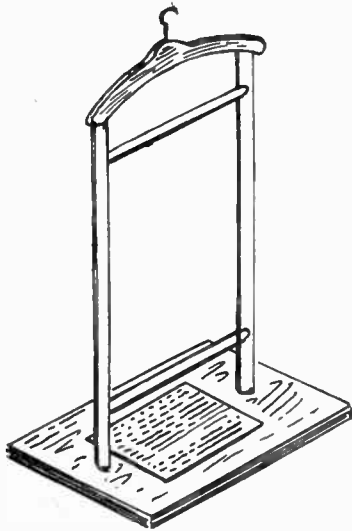


Fig. 1—A handy bedroom clothes stand

shoes to stand on to complete a nice neat compact and tidy article.

We generally want our slippers in the sitting room but no housewife wants them strewn all over the place. So why not have a slipper box (see Fig. 2) on the sitting room wall or at least nearby?

You need a box about 15ins. deep and 6ins. wide so it does not take up too much room. It can be made to fix on hooks just above the skirting and covered in cretonne to match the furnishings or curtains. Such a box will hold quite a few shoes.

Due to additional members of the family growing up we are often faced

with having two wardrobes in the same room. Few rooms can stand this really and the best plan is to turn the existing wardrobe across the corner and extend the coverage for clothes on either side, as shown in Fig. 3.

Wardrobe Extension

This will allow you two fine deep corners which will take no end of clothes. As there will be a good depth below the hanging clothes you can then fit in a shelf to shape on either side and thus store more shoes and other items away. If the fittings are made as shown they can be taken down at any time.

Having fitted the wardrobe and seen it stands firm, try and procure a rod or bar to go right across the top of the wardrobe and touching the wall on either side. From this you can either hang your curtains on large rings to move along as required or fix one of those very convenient curtain railways which are so simple to fit.

You must now cover in the top to exclude dust and this can be done with panel board. Fix a light batten to the wall just a little above the curtain rail.

You will have to make the panel clear the curtain and will require a beading of 1in. along the front edge to save it from bending. There is no need to cover the top of the wardrobe because this is already covered in.

It is a bit awkward when someone wants to do his or her homework or a member of the family wants to write a letter and mother wants the table for ironing. Why not a hanging bookcase and desk combined? Surely you have just one little space in the room where an article such as shown in Fig. 4 can be fitted.

Hanging Bookholder

You can make it with some boards about 8ins. deep. Try and get something fairly good as it will have to be part of the furniture. The width of the case is 2ft. 6ins. (larger if you wish but remember it is hanging, not standing). The depth is 2ft. 6ins. also. Arrange for two shelves which can be 9ins. apart. Consider what you intend to have in it or who is going to use it and then adjust accordingly.

The writing part is made 2ft. 6ins. wide and the depth of the space left under the lower shelf. Take a cut away from each side so that the desk part can be shut up and hinged, as shown. Chains are fitted to each side to support the flap. A fancy handle is added and the whole article stained in keeping with the furniture.

Fix to the wall with Rawlplugs and use at least four, as the weight will be somewhat heavy when in use. If in doubt, two light battens up the wall will not be noticed very much but at the same time, do not overload it. Make strong workmanlike jobs of all and finish off neat, clean and tidy to prove your efficiency and ability. (174)

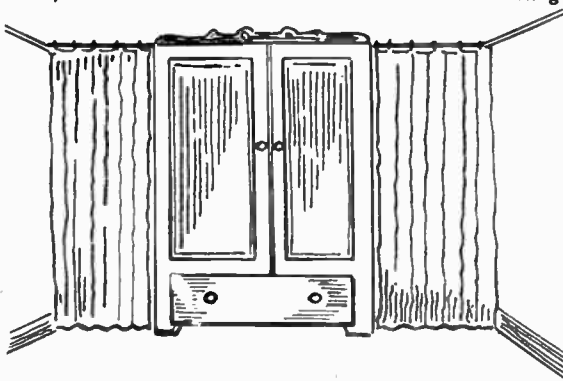


Fig. 3—A curtained extension to the wardrobe

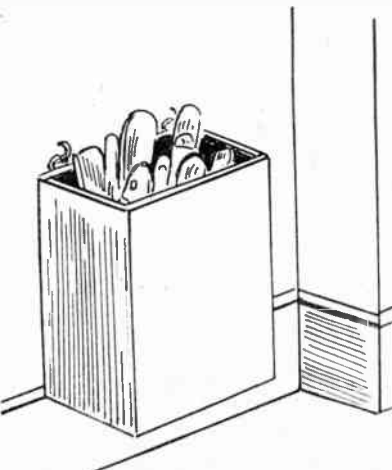


Fig. 2—An upright wall slipper box

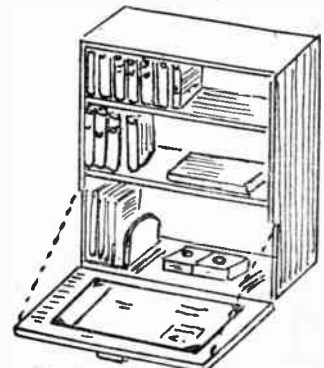


Fig. 4—Wall box fitted for books

Carved or fretted patterns on page 271 for this ORNAMENTAL INKSTAND

THE illustration, Fig. 1, given on this page, shows a simply-made inkstand decorated with low-relief recessed carving or by a simple fretted panel. Full size patterns of the parts are shown on page 271, as well as constructional detail drawings.

The base will be the first part to make, and this consists of two layers of $\frac{3}{8}$ in. wood, as shown on the plan in Fig. 2. The lower piece measures 9 ins. by $3\frac{3}{8}$ ins. and the edges of three sides may be rounded off neatly or left square, as shown. The upper member is $8\frac{1}{2}$ ins. by $3\frac{3}{8}$ ins. and will have the three openings cut in it, as shown in the plan.

Ink Bottle Apertures

The two square openings are for a pair of ink bottles of the sloping front variety which are most convenient for use with such a stand as this. Set out the measurements given, either direct on to the wood or on to paper. From the paper pattern the shapes can be transferred by means of carbon paper to the wood.

Where the openings have been cut out with the fretsaw, clean off the cut edges with fine glasspaper before gluing down the piece to the lower member. In applying the glue, use it sparingly and thinly, so that when the two layers are finally cramped together, the glue will not squeeze out and spoil the neat effect.

One or two flat-head screws may be run in from the underside of the lowermost base to hold the two pieces securely together, the heads of the screws being properly countersunk. Finally clean up the back edge of the base.

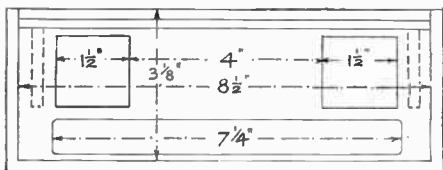


Fig. 2—Plan of base parts and overlay

There are two methods of making the back. One is to have a solid piece of $\frac{3}{8}$ in. wood, and the other to have two pieces of $\frac{3}{8}$ in. glued together. The front piece in the latter case being prepared for the carving. If the one piece of solid stuff is used it will be necessary to cut it to outline only and set in the carved design with chisel and gouge just as ordinary relief carving.

We give a full size pattern of the back on cover three of this issue.

The actual outline may be traced and then re-drawn on the wood. On this solid piece of wood also must be transferred the floral design ready for carving. The piece of wood should be securely clamped to the bench and the whole outline round the design cut down with, say, a $\frac{1}{4}$ in. chisel and gouge, to a depth of about $\frac{1}{8}$ in.

The floral design, as shown here, has been prepared also as a fretwork overlay, the small pieces connecting up with the main frame of the design being, of course, cut out. The whole ground-work is recessed to the depth given and later gone over with the matting punch which gives uniformity of texture all over and makes suitable contrast to the carved work which can now be completed.

Do not over-elaborate the amount of carving, but just pare away the wood in certain places to emphasize the rounded stems and the grooving between.

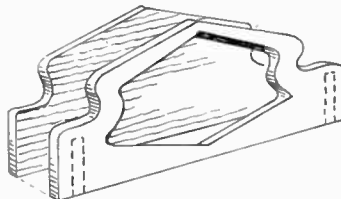


Fig. 3—The two-part back

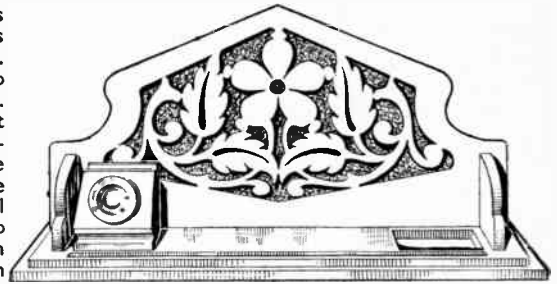


Fig. 1—The completed stand with ink holder in place

The second method of making the carved back is, perhaps, the simpler. At Fig. 3 there is shown the first process of cutting the main back piece $\frac{3}{8}$ in. thick and the front frame which is to be glued to it. The interior floral portion is cut out separately from the frame. The same piece of wood, however, is used from which the frame has been removed.

The overlay is glued to the backing piece and the carving carried out somewhat as in the first method. The backing should be matted in a similar way to that previously suggested after the gluing has been finished. On the pattern sheet is shown a very simple design which can be used as an ordinary fretwork overlay to be glued direct to the backing pieces and with the interior openings matted, as shown. After a final cleaning of the top surface of the base, the back upright may be glued and screwed on, as in the detail Fig. 4.

To stiffen up the two parts, the base with the upright, two brackets as (B) on the pattern sheet are cut out and glued.

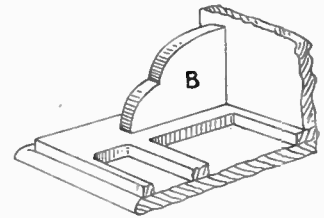


Fig. 4—Cut-away showing assembly

Theodolite—(Continued from page 263)

one is sure how it works, the construction presents little difficulty. No definite dimensions need be given, since odd scraps of wood may be utilised. Nothing but well-seasoned hardwood should be used. The base is about a foot in diameter and the turn-table 9 ins. diameter.

The scale of degrees with every 5 degrees and 10 degrees emphasised is drawn on cartridge paper, and there is no need to carry it all round the base; through 180 degrees is enough, or rather for 90 degrees each side of the central zero line. A small brass pointer is filed up and let in flush with the underside of the turn-table.

On the turn-table two standards are tenoned in. These are about 4 ins. high and about $2\frac{1}{2}$ ins. wide at the bottom, with the tops tapered and rounded off. One has a large hole bored in it to show the plummet. The beam is about a foot long and of $1\frac{1}{2}$ in. by $\frac{1}{2}$ in. section wood.

Square plates of brass are screwed to the ends. One has a very small hole pierced in it. The other has a fairly large hole, across the centre of which thin wires intersect. Four small holes are drilled to take these wires.

A metal protractor such as supplied with geometry sets is obtained and screwed to the centre of one side of

the beam, as shown in the drawing. The beam is pivoted to the standards by means of large nails driven in. To one of these the plumb-line is attached.

If one can take the extra trouble, it is better to draw one's own semi-circular scale with zero in the middle (where 90 degrees is on the protractor). This saves having to subtract the reading from 90 degrees. The nails pivots should be driven in line with the centre of the protractor.

The turn-table is connected to the base by a wing nut and bolt, with the two parts separated by a thin washer, so the turn-table revolves easily.

Tanks, stocking, feeding, ailments—all about THE CARE OF GOLDFISH

THERE are probably more fatalities among goldfish than among any other creatures kept as pets. It is not that goldfish are abnormally delicate or that their care is a highly complicated matter. The trouble in nine cases out of ten is that their owners do not appreciate that goldfish need plenty of space.

Small glass bowls are inadequate in size and the narrow neck of the bowl restricts the surface area of the water exposed to the air so the fish suffer acutely from a lack of oxygen.

The ideal amount of 'elbow-room' for goldfish should be reckoned as 1 gallon of water to 1 in. of fish. A 4 in. fish, therefore, requires 4 gallons of water, two 3 in. fish 6 gallons, and so on. This, of course, is the ideal arrangement, but it may not always be practical, but do try and get as near to it as possible. If you can only provide a 1 gallon container it would be kinder to abandon the idea of keeping goldfish altogether.

The Tank

All-glass tanks are expensive, but you should be able to obtain an iron and glass tank 18 ins. by 12 ins. by 12 ins. for about 30/-; much cheaper, of course, from a good second-hand dealer. Another idea is to visit a builder's yard, for very often one may find an old kitchen sink lying around unwanted. This would be preferable to a miserably inadequately sized fancy glass bowl. The greater the surface area of the water, the better for your fish.

Now to set up the tank. This should be attended to about a fortnight or so before you buy your fish in order that the fresh-water plants introduced shall have time to establish themselves. Firstly, the tank should be thoroughly cleaned. Next, draw off sufficient tap water and let it stand in a dust-free place for a couple of days, stirring it occasionally.

This procedure is necessary, as most tap water is chlorinated these days, but under the treatment described the chlorination wears off.

A Sandy Floor

Having topped up the tank, the next job is to cover the bottom with clean fine sand (aquarium sand is best, obtained from pet shops). It is advisable to wash the sand well, as you will be surprised at the amount of dirt it contains. The sand should slope gently from the back of the tank to the front (say, 3 ins. at the back and 1 in. deep at the front). This is necessary in order that food scraps and other rubbish shall collect at the front of the tank, from whence it can be removed more easily than if scattered all over the bed of the tank.

It is no use putting in the sand before

the water, for the simple reason the water will wash the sloping sand level. The best way is to cut a piece of cardboard about the same size as the front of the tank, insert it near the back of the tank and then empty in the sand. By careful manipulating you can thus control the level at which the sand settles on the bottom of the tank and so achieve the desired slope towards the front.

Water Plants

Pay a visit to a pond and collect a dozen or so water plants, being careful not to damage their roots. Wash them thoroughly in running water and then, with the aid of a forked stick, gently push the roots well home in the sand at the bottom of your tank. The larger plants should be set towards the back of your tank where the sand is deepest.

After covering your tank with a sheet of glass or plywood (raised 1 in. or so above the top edges) in order to keep dust, etc., out of the water, allow your tank to stand for ten days or a fortnight so that the plants will take root and commence aerating the water. At the end of this period you may safely instal the fish.

There are several good dry foods on the market, but always avoid over-feeding, as uneaten food tends to pollute the water. Goldfish will appreciate Daphnia, which is a live food—a type of fresh-water flea obtainable from most pet shops. Earthworms, if finely chopped, may also be given.

To Prevent Chills

When topping up the tank, always be sure the water is of the same temperature or not lower than that already in the tank. Goldfish are likely to catch chills if colder water is added. One sign that the water needs changing is when you see the fish coming to the surface for air, as this indicates a deficiency of oxygen. Remove any rubbish without delay and cut off any dead leaves of plants.

Too much direct sunlight will promote the growth of algae on the inside of the glass. Fresh-water snails will do a great service in keeping the tank sides free of scum.

Common Ailments

Goldfish, although reasonably hardy, occasionally suffer from one or other of the three following ailments, so you should know what measures to take. Fungus—a white fluffy growth on the fish, is, perhaps, the most common complaint.

Remove the fish and place in another container in which the water contains a solution of sea-salt (obtainable from chemists) in the proportion of one ounce of salt to a gallon of water, the temperature of which should be the same as

in your tank. The fish should be immersed in this salt-water 'bath' for about two hours every day until cured.

Chills we have already mentioned. Special care should be taken during very cold weather; when changing fish from one tank to another; or when adding fresh water. Sudden changes of temperature must be avoided at all costs.

Constipation in goldfish is not uncommon. Fish suffering from this ailment will be seen swimming with their droppings trailing from them. A deficiency of fresh food is the usual cause, so give Daphnia or finely chopped worm without delay. (182)



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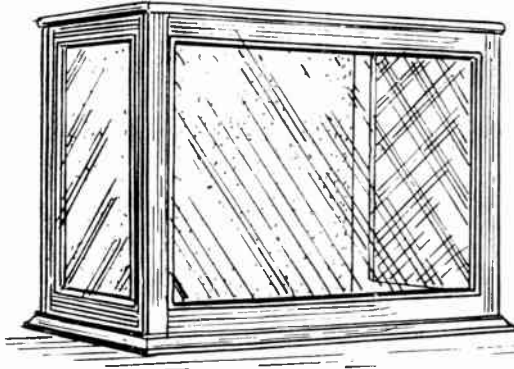
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Keep your taxidermy free from dust in a STUFFED BIRDS' CASE



READERS who are interested in the art of taxidermy, will require a case for exhibition of their specimens. Quite a good case can be made if some decent wood is available, pleasing in appearance, but not so ornate as to distract interest from the stuffed birds within. Well seasoned hardwood, oak or walnut, for example, is a good choice, but almost any other hardwood will do, as it can be stained or painted to suit.

No dimensions can be given as obviously, these must depend on the size of the stuffed specimens. Ample space should, however, be provided, to prevent an unpleasantly crowded appearance. Having decided on the dimensions of the case, prepare 4 upright posts, and 8 horizontal rails for the framework.

The posts will be the actual height of the case, less base and top, and the rails $\frac{3}{8}$ in. less than the full width or depth of it. The whole will be of 1 in. square wood throughout. Plane the strips of wood to these sizes, then set out and cut the corner joints to make a framework, as shown in part, Fig. 1.

The corner joints are detailed in Fig. 2. Sizes of the tenons are given in detail (A), the mortises being cut in the posts to correspond. As the tenons will meet together in the mortises, as at (B), mitre them. Test these joints and if necessary glasspaper or file the mitred ends of the tenons if they are a shade too long and likely to prevent the joints closing up properly.

It should be remembered that when glued up, some of the glue will come between these mitred joints and possibly prevent what would otherwise be a close fit, hence the warning.

Before gluing up the framework, cut the top and base of the case. These should be the same outside dimensions as the framework, and it is important to see they are cut truly square at the corners. Both could be

cut from plywood, at least $\frac{1}{4}$ in. thickness, or possibly a good quality substitute board.

Glue the framework well and knock the joints up tight, then place on the base and test for squareness. Any faults in this direction can then be remedied. Tie tape round the framework, top and bottom, as tightly as possible, to hold all joints securely while the glue gets hard.

Assembly

The framework can now be levelled over, at top and bottom, if necessary, to provide a flat seating for the top and bottom of the case. Fix the bottom first with glue and screws, the latter well countersunk. Then the top can be similarly fitted, but using nails instead of screws. Suitably sized oval nails will do, the heads being punched slightly below the surface and the holes stopped up level.

To hold the glass in position, beading is superior to putty, and much less troublesome, especially if any of the glass unfortunately gets broken and needs replacement. The beading for the inside can be plain slips of wood $\frac{3}{16}$ in. or $\frac{1}{4}$ in. thick and $\frac{3}{8}$ in. wide.

Inside Beading

Prepare these accurately to length and mitre them at the corners. Fit them in with a little glue, and fine nails. Let the back edges of them be level with the inside surface of the framework, leaving just $\frac{1}{8}$ in. in front for glass and beading in afterwards.

Glass will be required for front and ends of the case, but for the back, wood can be substituted. The detail (F) in Fig. 3 shows the back, which can be of plywood or substitute board, fitted in and kept in place with a plain slip of wood outside. The outside glass beading is of $\frac{3}{16}$ in. by $\frac{1}{2}$ in. section wood, the outer edges of which are neatly rounded. Cut and mitre them to fit each panel

opening, but do not fit them in just yet. Instead, finish the case.

Base Edging

At the edges of the base a $\frac{3}{8}$ in. by $1\frac{1}{2}$ in. moulding can be mitred round, fixed with glue and screws, as at (C) in Fig. 3. This by the way covers only the front and ends, the back being a plain strip, level with the bottom of the case, and not extending beyond. Alternatively, a plain $\frac{3}{8}$ in. by $1\frac{1}{2}$ in. strip of wood can be used here, with a half-round or moulded strip covering the edges of both strip and bottom, as at (D). The moulded strip is omitted at the back of the case.

The edges of the top of the case can also be hidden by gluing and pinning round a $\frac{3}{8}$ in. half-round moulding, as detailed at (E). The woodwork can now

Polish on Hands

AFTER doing french polishing, a difficulty is found in removing polish from the hands. Place half a handful of washing soda in hot water, soak the hands for a few minutes and wash off with clear water.

be glasspapered to smoothness, and finished. The interior of the case can be painted sky blue, or otherwise decorated, as may be preferred. The outside can be stained and polished or varnished, if oak or fancy hardwood. In fact, almost any hardwood can be improved with an oak or walnut stain.

A Varnished Finish

Many of these cases are finished with a black stain, and clear varnished. A black finish has one advantage, it does certainly show up the specimens within better, perhaps, than any other treatment. While on the job, finish the beading as well, and number each piece in pencil to ensure correct fitting afterwards.

Now cut the glass panels for front and ends. The end ones can then be fitted in with their respective beading. Use thin nails and hammer them in lightly. Then arrange the stuffed specimens to satisfaction and glass and bead in the front, and touch up any hammer marks with varnish.

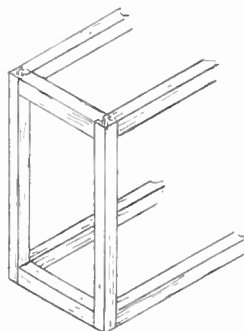


Fig. 1—Carcase of case

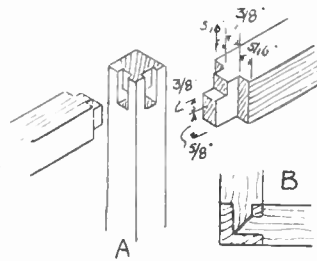


Fig. 2—Details of corner joints

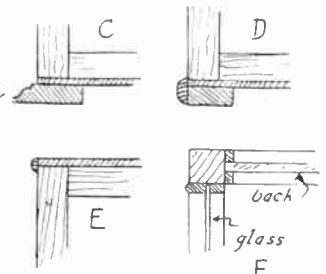


Fig. 3—Base and cover joints

A PHOTOGRAPHIC ALPHABET

More helpful hints in our practical series. Points the beginner and amateur should know. Look out for further pages.

G for—

GASLIGHT PAPER

THERE are broadly two types of developing printing paper as far as the amateur is concerned, i.e., paper which looks just the same after it has been exposed behind a negative and which has to be put into 'developer' to get the picture to appear.

The two types are Bromide and Gaslight. Bromide is very fast (sensitive to light) and only requires an exposure of a fraction of a second, but 'gaslight' is

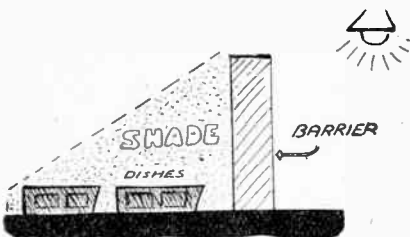
'glossy paper' (which really is quite dull when allowed to dry naturally). After a good washing they are placed as quickly as possible, face down on the polished surface. A sheet of clean blotting paper is placed on top and the prints are pressed into good contact by running a squeegee across if possible—a round ruler will also do the work, as will a steady pull across with a flat ruler.

The sheet is now put on one side to dry, when the prints will peel off with a high gloss. Should prints stick, there has been grease on the plate. Stuck prints may be saved by re-soaking.

or the degree in which it is sensitive to light.

There are several systems of showing speed, but this one was worked out by two scientists—Hunter and Driffield—and is the one most commonly used by English manufacturers, although the Continental speed indications are often added.

At first it is somewhat impossible for an amateur to appreciate just what



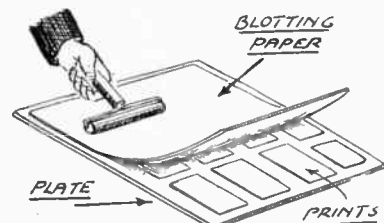
Working behind a light barrier making shade slow and can be used in an ordinary room if the light does not shine directly on the surface while it is being developed.

Gaslight paper is easy to use and can be bought at any dealers in various grades such as vigorous (for thin negatives), soft (for hard negatives) and normal, also in different surfaces like glossy, velvet and matte.

The paper is placed behind the negative in a frame and held out to the light (not necessarily gaslight) for a predetermined time (generally found by tests). It is then put in the developer (bought by the packet for a few coppers) and finally 'fixed' in hypo and well washed.

GLAZING

THAT very high gloss you find on some prints is put on by a simple method which costs nothing. Required is a sheet of glass, or one of stainless steel or chromium. In any case, the surface must be absolutely free from grease—glass needs particularly special



How to glaze prints

care to get the scrupulous cleanliness necessary—the metal plates clean much easier.

The prints to be treated must be on a

GRAIN

THIS is a word we are hearing quite a lot about in photography at the moment, especially in connection with miniature work. Every photograph is made up of thousands of tiny particles of a silver salt embedded in a binding

Any Interesting Photos?

THE Editor is always pleased to see—and pay for—photographs of outstanding or unusual pieces of work, or novel displays where there craft was exhibited. Such prints must be clear and sharp, and be sent with a note about the matter which will be of interest to other readers. Such prints will be returned at once or as soon as possible after publication in these pages.

material. Generally these particles cannot be detected with the naked eye, but under certain conditions, as, say, when a very big enlargement is made, they do appear and the result is said to be 'grainy' or 'show grain'.

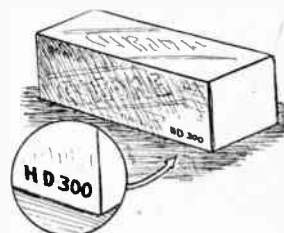
Grain has to be guarded against with small-sized cameras on account of the subsequent enlarging, and this is generally done by using a special 'fine-grain' developer which keeps the particles small and well knit together.

In any sized camera under-exposing and over-developing will cause 'grain'. Films have improved a lot in texture during recent years and most of the standard rolls are made with a very fine-grain emulsion to start with, which reduces greatly the danger of after handling, making component particles too obtrusive.

H for—

H AND D NUMBERS

ON many film cartons and boxes of plates you will see an inscription such as 'H and D 200' or 'H and D 250'. These show the 'speed' of the material,



The HD number on the box

speed a certain H and D number represents in sensitivity, but once, by trying out a film, this knowledge is obtained, then all other films can be judged from it, for the speed increases in proportion to the number. Thus an H and D 500 film is twice as fast as an H and D 250 product.

It is worth while to get to understand the H and D system of speed rating as soon as possible, for it tells you whether the materials you buy are suitable for your purpose.

HYPHO

THIS is the popular name for hyposulphite of sodium which is used throughout photography as a 'fixing' agent, i.e., for making films and printing papers no longer sensitive to light. With plates, films, gaslight and bromide papers it is used after development and with 'printing-out' paper (P.O.P.) after the picture has been made by putting paper and negative out in the sun.

Hypo is the cheapest chemical used in photography, a few pence buying a half-pound packet. It should, therefore, never be over-worked, a fresh 'bath' being made for each batch of plates or prints. Over-worked hypo can cause stains, in any case an old solution never gives the bright clean finish of one newly mixed.

The average strength of a hypo bath is 4ozs. of crystals to 1 pint of water, but can be used stronger or weaker without any ill effects.

Great care must always be taken to keep drops of hypo from entering other solution as its effect in most cases is to stop action. Even if hypo is spilt on to the bench it should be wiped up at once as, the water evaporating, a fine powder is left which can easily blow into unwanted places.

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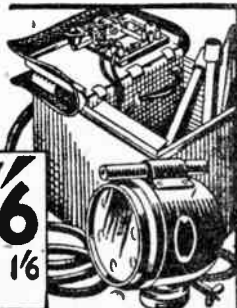
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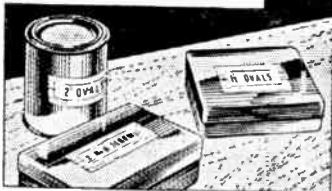


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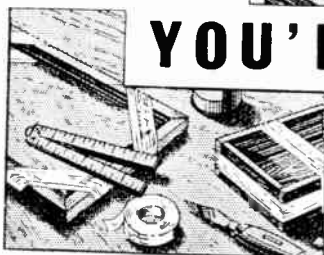
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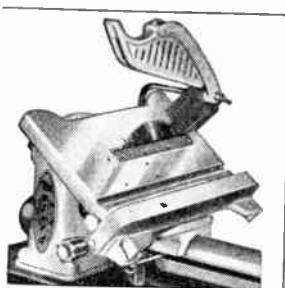
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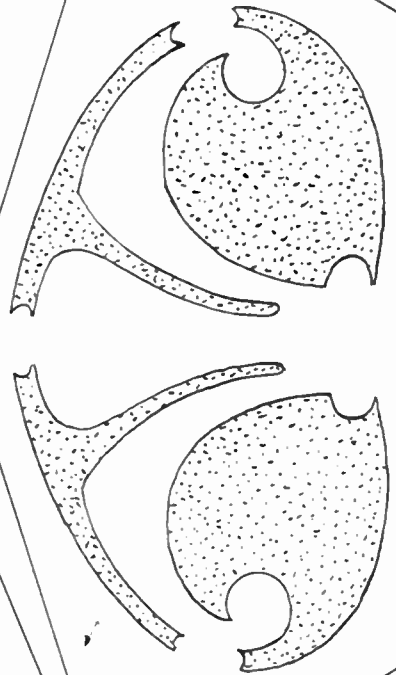
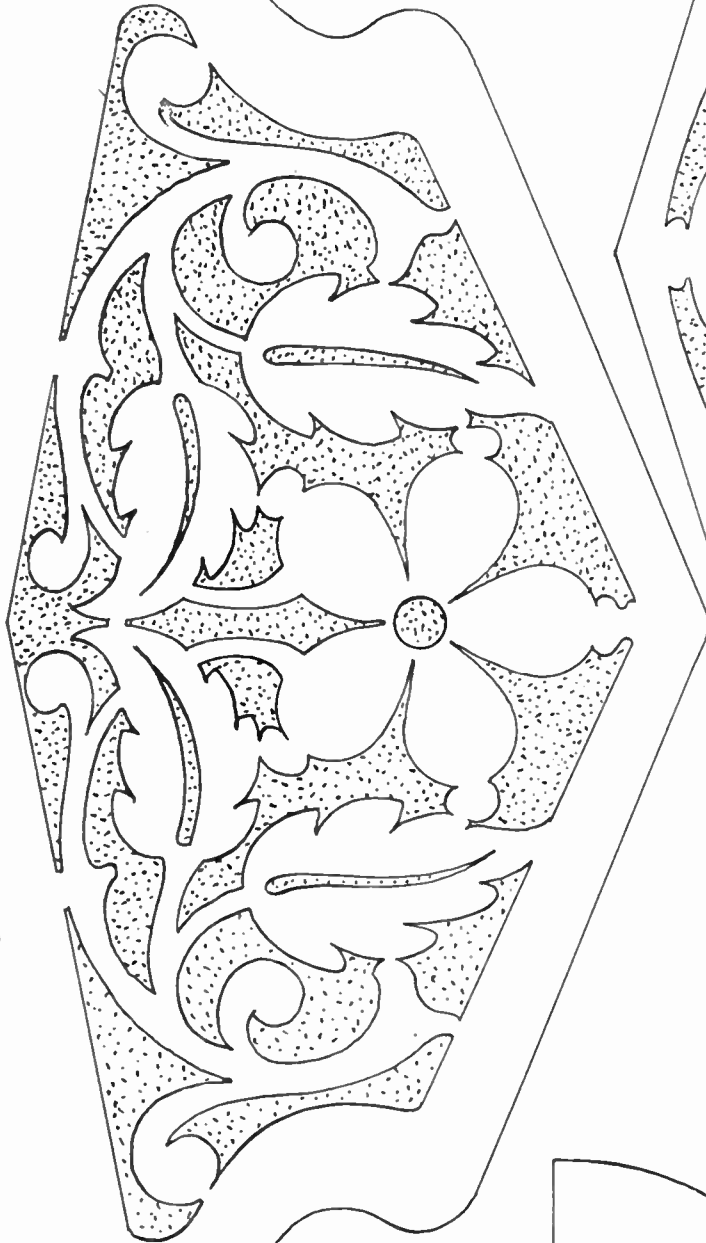
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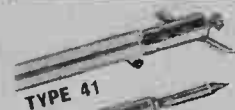
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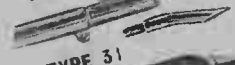
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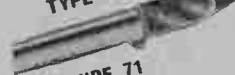
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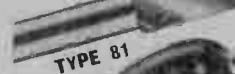
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