

Hobbies

WEEKLY

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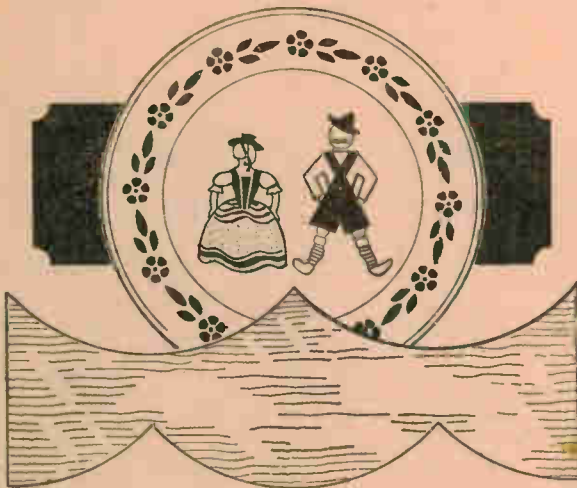
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Try making these DECORATIVE PLATES AND SHELVES

AS the diagram that heads this article will show, decorative plates on attractive shelves will make a very nice ornament for the home, whilst those who wish to commercialise their hobby may find scope for selling this idea to restaurants and snack bars.

The diagram shows just one plate on a single section of shelf but, of course, the shelf may be any length—the whole length of a room, for example, and there may be a dozen or more plates, varied by a jug or two.

Painted in Art Enamels

The plates themselves are handpainted with ordinary art enamels. To apply a pattern that forms part of the actual glaze of the plate requires materials and appliances—for example, a potter's kiln at a high temperature—far beyond the scope of an amateur. But as these plates are decorative only and not for use, and need only be washed, carefully, at comparatively long intervals, ordinary enamels, as just hinted, will be found quite satisfactory.

The best type of pattern to apply is, undoubtedly, that of the 'peasant art' style. Fig. A shows a number of motifs which should prove useful. The whole basis of this kind of decoration is the simple 'blob' shown at 2, or, in a slightly modified form at 4. A careful outline is NOT required. In fact academic art would be right out of place here. Naturally, a little preliminary practice is required, but several of the motifs on Fig. A have purposely been drawn rather roughly—to take two examples—Numbers 14 and 21—to show that even if the drawing is a little 'out' it is still attractive.

Incidentally, to conserve valuable space, the motifs in Fig. A have been reduced to a fraction of their original size. In copying them, make them much larger. You will, of course, work in bright colours. Fig. 19 hints at colour. Avoid dull and dark shades. For small work, the 'blobs' can be made with practically one movement of the brush by varying the pressure. For larger work, something on the lines of 1 and 3 may be needed. But—definitely, no

meticulous outlining and filling in.

Ordinary white plates are used, and should be new. Wash them carefully with plenty of soda in the hot water and then dry thoroughly. Any faulty work can be quickly wiped off with a rag dipped in turps. It would probably pay to have several brushes—one for each colour, rather than continually to clean one brush every time a colour is changed.

The Shelf Front

The shelf or rather the decorative shelf front can now be tackled. It is presumed that there is an existing shelf or that one is being erected. Unless it is intended to stand, also, jugs, etc., on it, the shelf can be quite narrow—almost a rail or ledge.

Decorative strips are tacked to the shelf edge and from (C) it will be seen that the strips are so designed to economise in wood and cutting. The original template, shown shaded, can be repeated any number of times. In the Fig. (P-Q) represents the width of a particular sheet of plywood or compressed pulp board, with three rows of shelf-edging marked out. The strips should be as long as possible, bearing in mind, however, the limitations of the fretsaw arm.

Plywood offcuts are much cheaper to

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buy if narrow, and for this reason the reader may prefer to mark out a single strip. Anyhow, this interlocking design certainly saves material and cutting.

To prepare the template, take a strip of paper exactly 12ins. long and about 9ins. deep. Fold in half, lengthways, and then in half again. In (B) the right-hand side has two doubled edges. The left-

above described, keeping (X) and (Y) the same distance apart but making shallower curves.

These pieces are then joined end to end with a strip of wood glued and tacked on as shown at (D). Unless this is done the strips, though apparently making a neat join when first assembled, will warp slightly and leave an un-

made. The sketch will show clearly what is meant.

Shaping the Wire

The main loop is pulled first into a rough triangle, the apex being just below the top of the plate and the base near the foot of the plate, the triangle of wire being laid over the back of the



A number of useful motifs

hand side has one doubled edge and two 'free' edges.

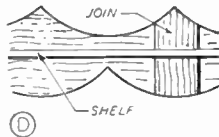
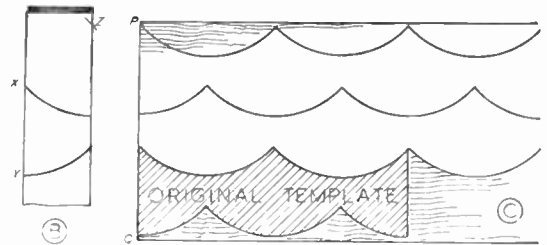
At a little way down (point Z), place the point of compasses, and with a 4ins. radius, swing off the curve from (point X). Then with (point X) as centre and with the same radius, swing in the curve (Y). Cut along these two curves and open out the paper. The result will be as shown in the shaded part of (C). If one has a really big job it will be an advantage to transfer this paper pattern to thin ply or metal to make a stiffer template.

For longer shelves it may be an advantage to have wider curves. For example, you can start off with a strip of paper 24ins. long and fold in four as

It would look better if the shelf edging were painted in a plain pastel shade—say, pale pink or blue—in a shade that would not compete, so to speak, with the bright colouring of the decorated plates.

Useful Plate-Hanger

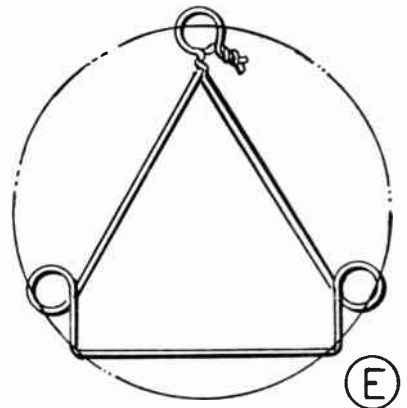
For those who cannot use a special shelf—those, for example, in rooms where such additions are not allowed or favoured—the wire plate-hanger is a useful gadget (E). One takes a length of wire approximately equal to the circumference of the plate to be hung. The ends are twisted together, leaving 1in. or 2ins. of each end remaining so that these can be again twisted and a loop



These drawings show the preparation and use of the shelf template

pleasant gap. The shelf will need a slight recess where these joining strips come.

The individual sections of shelf edging, cut, as just hinted, in $\frac{3}{8}$ in. plywood or $\frac{1}{4}$ in. compo board, can be assembled in batches of, say, six deep, temporarily clamped together, and their sawn edges well glasspapered.



Details of the plate-hanger

plate for testing. The ends of the triangle which project beyond the plate are turned up over the plate and finally neatened into circles as shown. The chain-dotted circle in the sketch represents the plate, of course. Reasonably stiff galvanised iron wire is used. This is cheap enough and can be obtained in small coils at any well-stocked ironmongers or, often, at garden-supplies stores. For clarity of illustration, the wire has been shown rather thicker than is actually the case. (407)

Card Tables—(Continued from page 323)

pivoted on $\frac{3}{8}$ in. bolts (washers between legs), and each pair is held square and rigid with $\frac{3}{8}$ in. by 1 $\frac{1}{2}$ ins. hardwood strips nailed at the ends and crossed over. Take care that the crossed-over strips on the inner pair of legs do not project and foul the outer pair of legs when folding the table up.

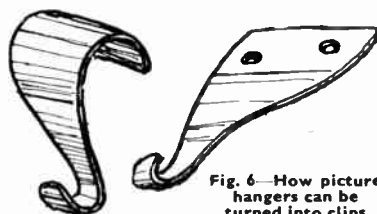


Fig. 6—How picture hangers can be turned into clips

The top ends of the legs need to be rounded off, and the lower ends can be rounded or bevelled to fit the floor. The table will be found to be quite rigid when set up. It looks well if lightly stained and varnished, but a good finish can be secured with a coat of paint after suitable priming. (412)

It isn't difficult to make folding CARD TABLES

THE well-known folding card table is an essential piece of equipment for many social clubs and other societies. During the winter many clubs run regular whist drives each week—their card tables coming in for some pretty hard wear and tear. Such tables are expensive items to purchase in these days of rising costs—a new table being not less than about thirty shillings. So if only one or two tables need replacing, it can be quite a large item on the club's budget!

It is suggested that the summer months will provide the opportunity to carry out a repair and replacement programme to your club's card tables. If hitherto the club has not owned any such tables, but has for long been considering the matter, here is a way to cut the expenditure by at least one half, providing the necessary voluntary labour can be recruited among the club members to carry out the woodwork.

The table referred to in the accompanying sketches will be found to be somewhat stronger than the average commercial article. The top is recommended to be $\frac{3}{16}$ in. plywood as against the more general $\frac{1}{2}$ in. material used. This allows the usual cross piece in the framework to be dispensed with, and if $\frac{1}{2}$ in. plywood is used, an even better result is obtained. A suitable alternative material is $\frac{3}{16}$ in. hardboard.

Make up the top framework from 1½ ins. by $\frac{5}{8}$ in. hardwood, 19 ins. square, with screwed corner joints. See Figs. 1 and 2. The plywood top is glued and nailed to the frame with $\frac{5}{16}$ in. panel pins and afterwards covered with an inexpensive cloth such as coarse linen or calico.

The cloth should be glued down with thin hot glue, and the edges turned down on to the top framework and trimmed off, afterwards covering with a 1 in. by $\frac{3}{8}$ in. edging strip of hardwood with mitred corners as at Fig. 2. Use $\frac{3}{4}$ in. oval nails for this.

Figs. 3, 4 and 5 show the construction of the crossed legs. They are each 31 ins. long, of 1 in. by $\frac{5}{8}$ in. hardwood. The inner pair of legs are joined at the top with a $\frac{1}{2}$ in. dowel rod which slips into a metal clip inside the top framework when the table is set up in use. The spring clip can be made from suitable picture hangers modified as at Fig. 6.

The outer pair of legs are pivoted at the top on 1½ ins. countersunk screws at (A), Figs 3. and 4. A thin metal washer should be placed between the legs and framework to give clearance. 16 ins. from the lower ends, the legs are

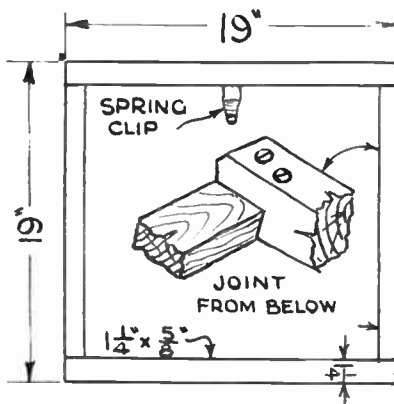


Fig. 1—Dimensions of the top frame

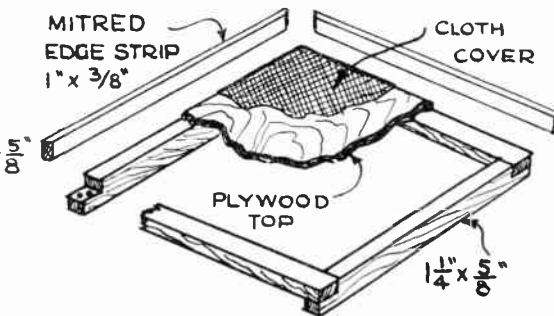


Fig. 2—How the top is covered and secured

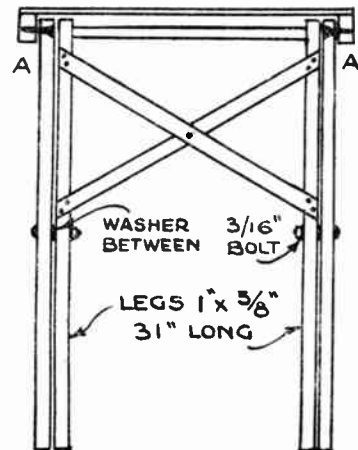


Fig. 3—Showing how the legs fold

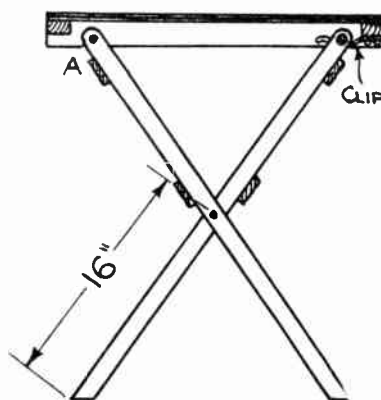


Fig. 4—Side view of the table

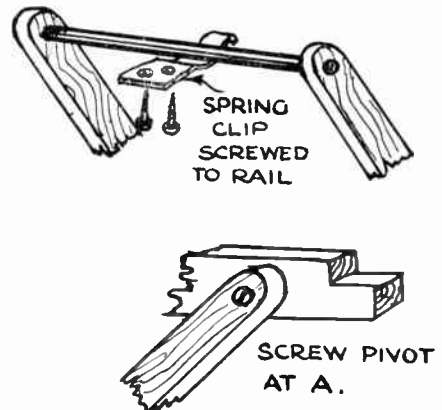
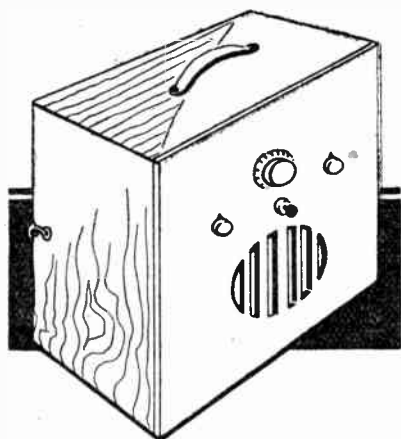


Fig. 5—Details of the clip and screw pivot

(Continued foot of page 322)

For the wireless enthusiast— AN 'ODD PART' PORTABLE



THIS portable is made up with parts it is most likely the constructor will have to hand. It is in no way a midget set, but uses ordinary 2-volt type valves, and is driven by a 2-volt accumulator, and 90 or 120-volt H.T. battery. A fairly large loudspeaker can be used, to give maximum volume. The frame aerial windings can also be large, so that good signal pick-up is obtained. The long and medium wave sections are also kept wholly separate, and this

The Containing Case

A robust case will be obtained if $\frac{3}{4}$ in. ply is used throughout, and the dimensions to be given are for this. If wood of other thickness is used, some of the measurements will have to be altered accordingly, in order that the pieces will fit properly, when sawn out.

Back and front consist of pieces 18 ins. by 18 ins. Four holes are drilled in the front, to accommodate the tuning condenser, reaction condenser, wave-change switch, and on/off switch. Below these the fret for the speaker is cut out. It is best to make this suitable for the diameter of the speaker used. For example, with a $5\frac{1}{2}$ ins. speaker, draw a circle $5\frac{1}{2}$ ins. in diameter, then divide this vertically, as shown, then saw out. Do not mount speaker or other parts at this stage.

The wooden frames shown in Fig. 4 are now cut out, using strips of wood $\frac{3}{4}$ in. wide. For each frame two strips 17 ins. long will be required, and two (those going vertically) $16\frac{1}{2}$ ins. One frame is secured to the front, using small screws or panel pins. The second is secured to the back, to which is also attached two hinges.

The body of the case is 6 ins. deep. For the top, a strip 18 ins. long is used. For each side, use pieces $17\frac{1}{2}$ ins. long

(A). Pass the wire through, and plug tightly. Now wind on 32 turns side by side. Pass a loop of wire through hole (B), plug, and wind on a further 10 turns, finishing off at (C). Leave the ends of the windings several inches long. Note that lead (B) consists of two wires, forming a loop. Twist these together, and take to the moving plates terminal of the tuning condenser, which can now be mounted.

The rear frame is wound in exactly the same way, except for the number of turns. Employ 10 between (D) and (E), and 3 between (E) and (F). It is best to take the three leads to a small terminal strip (see Figs. 4 and 5). Short flexible leads can then be taken from these terminals to the receiver, so that the chance of the thin wire being fractured by bending when the back of the set is opened is avoided. Somewhat thicker wire, such as 24 S.W.G., D.C.C. or enamelled, is best for this frame winding.

The front may now be fitted into position, and the hinges secured to the back screwed to the case. The back should open and close readily, with a little free space all round the frame winding.

After varnishing the case, place a piece of speaker fabric over the inside of the fret, and screw the speaker in position.

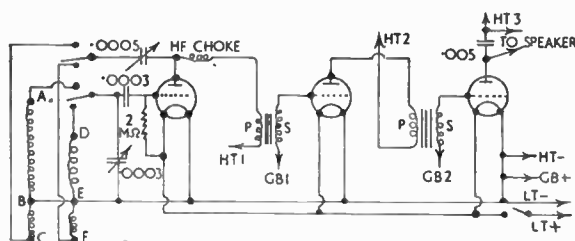


Fig. 1—The theoretical circuit

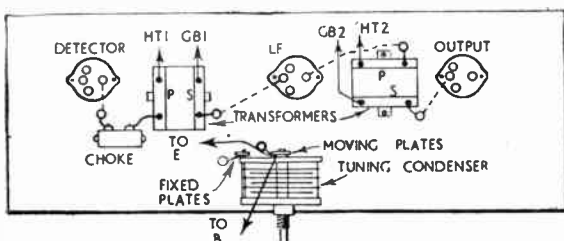


Fig. 2—Wiring above the baseboard

further increases efficiency.

As a result, it will be found that the set gives very good results, yet is not in any way difficult to build. None of the components are critical, though, naturally, very old valves and other parts are not likely to give as much volume as will be obtained if all components are in good order.

with a piece $17\frac{1}{2}$ ins. long for the bottom. These pieces are fitted securely together, long, thin screws being preferable, and a carrying handle attached with small bolts.

The Frame Windings

Take a reel of 32 S.W.G. or similar enamelled wire, and make a small hole at

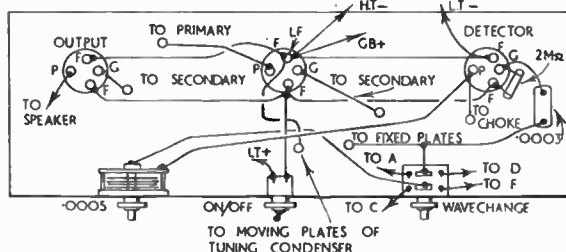


Fig. 3—Below baseboard wiring plan

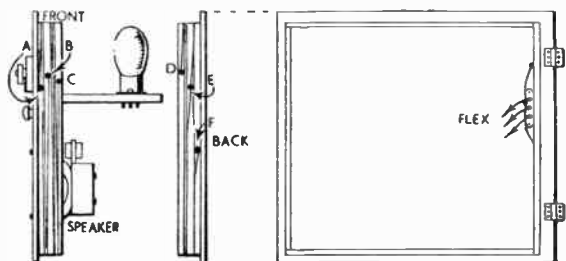


Fig. 4—The frame aeriels and windings

Receiver Baseboard

The receiver is built on the strip shown in Fig. 2, which is $17\frac{1}{2}$ ins. long and about $4\frac{1}{2}$ ins. wide. Drill 1 in. diameter holes for the valveholders, and screw these so that their sockets project below, where most of the wiring is situated. Note that the sockets are not equally spaced, and position the

holders so that all the 'plate' sockets are to the right, as in Fig. 2.

The small high frequency choke and two transformers are bolted or screwed in position, the cores of the latter being at right angles. All the wiring shown in Figs. 2 and 3 can now be done. Any insulated wire of fairly stout gauge can be employed. Flex will be required for the battery leads, which are best fitted up with proper plug and spade ends.

Fitting the Receiver In

Screw two small strips of wood on the inside of the cabinet, at the sides, about 4½ ins. from the top. The baseboard can now be pushed in so that it rests on these. The bushes of the switches and reaction condenser are placed through their holes, and their nuts and knobs put on. Four small screws down through the baseboard into the strips mentioned will hold this item secure.

Two or three wires will now remain to be put on, notably those to the tuning condenser, and leads (A) and (C) from the frame to the switch. Also connect up the flexible leads from the rear frame, and take two wires to the speaker transformer—one to the plate of the output valve holder, and the other to H.T. positive. The .005 mfd. condenser is joined directly across the speaker transformer.

Ample space has been left and the batteries can be positioned in the bottom near the speaker.

Component Notes

Any ordinary coupling transformers of 1:3 to 1:5 ratio can be used. If those used are marked P, HT, G, GB for plate, high tension, grid and grid bias con-

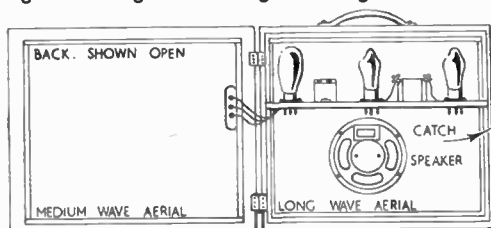


Fig. 5—Rear view of receiver

nections, follow these markings. There is no need for the two transformers to be of the same make or type; it is, in fact, best to use two components of different characteristics.

Any ordinary .0005 mfd. air-spaced tuning condenser is used for tuning, with a .0005 mfd. solid dielectric condenser for reaction. Any suitable on/off switch can be used. For wavechanging purposes, any double-pole double-throw rotary or push-pull switch can be used.

The speaker should be a moving-coil permanent magnet one, equipped with matching transformer. (The transformer is *absolutely essential*).

For Detector and L.F. positions, HL2 or similar valves can be employed, with an LP2 or similar small power valve for output. Almost any 2-volt valves will function in such a circuit, but good valves will give best volume and quality of reproduction. Do not touch valve-pins on wrong holder sockets with batteries connected.

Operating Notes

Take HT3 to the maximum voltage on the battery. HT2 may be taken to 90 or 120 volts, according to volume required. HT1 will best be taken to about 60 volts. The more voltage used here, the stronger will reaction become. With a detector valve in really good condition, 48 volts will be sufficient, and this tapping on the battery can be used.

The GB1 and GB2 plugs should be taken to those sockets which give best reproduction and quality. It is very necessary that the bias thus applied should be approximately suitable for the valves actually used, otherwise distortion may arise, and loss of volume.

Reaction should be used to build up the volume of weak signals, and the set turned a little one way or the other, if necessary, to make use of the directive properties of the aerials. Finally, some L.F. transformers work best with the secondary leads reversed, and this can be tried, notwithstanding any markings which may actually be on these components. (410)

Make this SIMPLE RADIATION DETECTOR

ALL you need for this instructive instrument, which is the domestic equivalent of the physics laboratory cloud chamber, is a shaving cream jar or something similar; a strip of felt; a strip of black velvet and a disc of same; any common alcohol and ice, preferably dry ice.

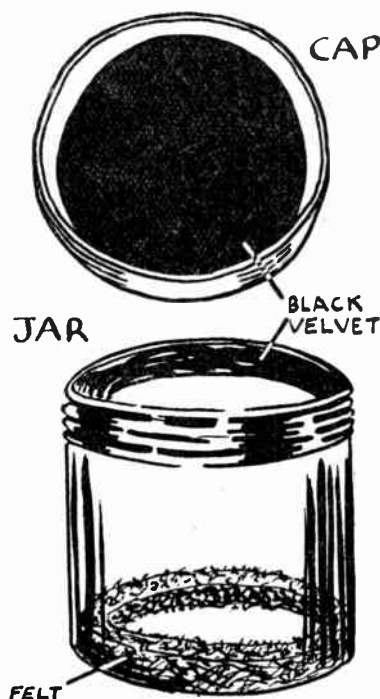
Making the Jar

Take the cap off the jar and coat the inside of it with glue or fabric cement. Fit a disc of black velvet so that it comes right to the edges of the cap. Do not take out the rubber ring.

Now, cement a strip of similar black velvet to the inside of the jar mouth, then cement a circle of felt weather strip around the inside of the jar next the bottom. Rubber cement is most suitable for this.

Ready for Use

When the cements have set, the apparatus is ready for use. Standing the jar on its bottom, pour in some alcohol (ordinary ethyl will do, but methyl or propyl are a little better) so as to saturate the felt and to leave about ½ in. on the bottom. Put on the cap.



Warm the bottom of the jar with your hand and then place it upside down on a container of ice or solid carbon dioxide. The ice is best put in a coffee tin and covered with sawdust. Stand the jar on top of the sawdust.

Cosmic Rays

Very shortly you should see straight lines and zigzags of vapour as cosmic ray particles shoot through the jar. An oblique beam of light makes them clearer.

The instrument can be used for studying these cosmic rays that shower the earth from space, for detecting the presence of radioactive minerals in rocks, and for showing up the beta and gamma rays given off by radium.

To see these last, simply hold the dial of a luminous watch near the jar at right angles to the beam of light.

Regenerating

When the vapour trails are no longer visible, the instrument can be regenerated by taking it away from the ice and warming it well between the hands. (378)

Here are some clever IDEAS FOR CYCLE STANDS

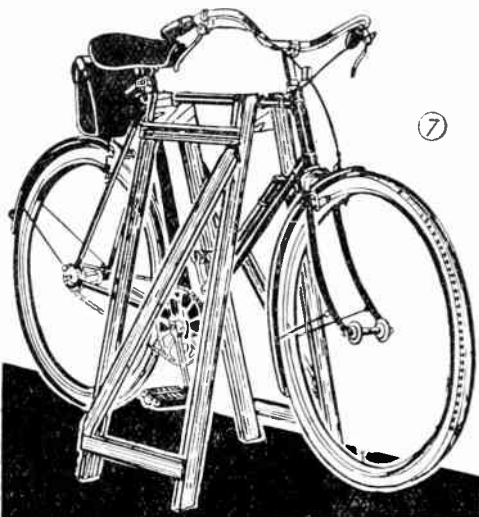
IDEALLY, cycles should be kept in a special shed, held up by special brackets. But, for many, this is not an ideal world. There are many who have to keep their cycles on landings or in passages, or, not being property owners or main tenants, find difficulty in getting permission to build any kind of bracket for the cycle out in the yard or garden.

Support Important

Yet it is most important for the cycle to be properly supported, more particularly in the case of one fitted with a small motor, as an overturn may result in serious damage. And, in any case, a slipping cycle may damage its own enamel or the wall against which it has been placed.

This article, however, will suggest several ways of supporting a cycle and from them, or from the reader's own version of one, or a combination of them, a satisfactory solution of the problem should be found. In most cases no set dimensions have been given, or, where they are given, they are suggestions only as, in the first place, cycles vary in size and, secondly, odd pieces of wood may be used, always bearing in mind that it is better to err on the side of massiveness rather than of flimsiness.

Fig. 1 shows an arrangement which is practically self-explanatory. The ground pieces are in the form of a T, a halved Tee joint being employed. The upright is screwed on and further strengthened with a triangular block as shown. The two braces, apart from their real purpose of supporting the wheel of a cycle, serve further to strengthen the bracket. The inside width between them will be roughly 2ins. The top arm of the base T piece should be made reasonably long so that the bracket does not topple over.



A really firm stand

Such a job can be used anywhere in the yard or garden, or can be a semi-fixture in a proper cycle shed. It should be well creosoted.

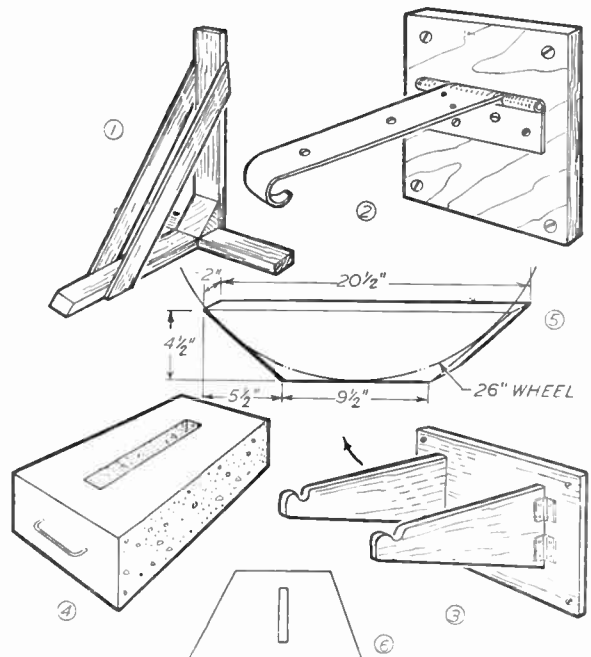
Fig. 2 shows another simple device. A large size Tee hinge is obtained. (It is possible to obtain one 24ins. long). One end is formed into a hook, as shown. The hinge is then secured firmly, with proper fibre plugs, to an outside wall at approximately the same height as the crossbar of the cycle. In use, the bent end is hooked round the top crossbar of the machine, the wheels of the cycle being at the foot of the wall, so that the cycle slopes

a little outwards. When not in use, the hook hangs down against the wall, out of the way. For a lady's machine, the hook can be arranged to engage with the handlebars.

Fig. 3 shows a more elaborate version of this, the brackets, this time, being of wood and reasonably deep at the 'wall' end, so that they can support the weight of a cycle. The general shaping can be seen from the sketch. The brackets are hinged so that, when not in use they can be swung outwards against the wall. The height is so adjusted that when the cycle is in the two notches (by the crossbar) the wheels are 1in. or 2ins. off the ground. The brackets should be long enough to allow for the handlebars of the machine being clear of the wall.

A useful and most sensible device now widely employed is the slotted concrete block (Fig. 4). This is quite easily made by first rigging up a box, the overall size of the block required and, after inserting a wooden shape (Fig. 5) pouring in the concrete. The wooden shape is dimensioned to take a 26in. wheel. For other sizes, other dimensions will apply, though even with the slot dimensioned as shown, a 28in. wheel can be accommodated, or the smaller wheel of a child's cycle.

The concrete can be made on



Various types of stands and supports

the '3:2:1' principle, i.e. 3 parts of gravel, 2 parts of sand and 1 part of cement. The sand and cement are first mixed dry, until the mixture is an even grey and not streaky. Then mix with the gravel (also dry) and then add water, through a rose-ended watering can, turning all the while. To economise in cement, an odd brick or two can be added. It is an advantage to add a handle—any odd piece of strong iron rod bent to shape and added whilst the concrete is liquid. This handle is shown in Fig. 4. Its sole purpose is to enable the concrete block (which will be very heavy) to be dragged out of the way when required. The handle, however, is quite optional.

If the reader is a home owner and is thinking, anyway, of relaying a concrete path, opportunity might be taken of sinking a cycle slot at ground level (Fig. 6).

Original Idea

Most of the foregoing ideas may be vaguely familiar to the reader and will serve as reminders. But here is something which the writer claims to be completely original—a cycle stand which he used for many years and can guarantee to be a really practical proposition. Fig. 8 shows the actual stand, and Fig. 7 shows it in use.

First—just a brief explanation on how the stand is used. The cycle is raised (by lifting the top tube with one hand) whilst the stand is tilted so that the two rear legs are pushed through the frame

of the cycle until they touch the ground again. The cycle is then lowered so that the top tube rests in the top notches of the stand. The cycle is now securely held, without strain, with the wheels off the ground. The whole can be covered with an old tarpaulin and can be safely left out of doors in all weathers. (In fact, the writer devised this stand because, during the War years, in 'digs' he was given no option but to leave his cycle out in a yard, no covered accommodation being available).

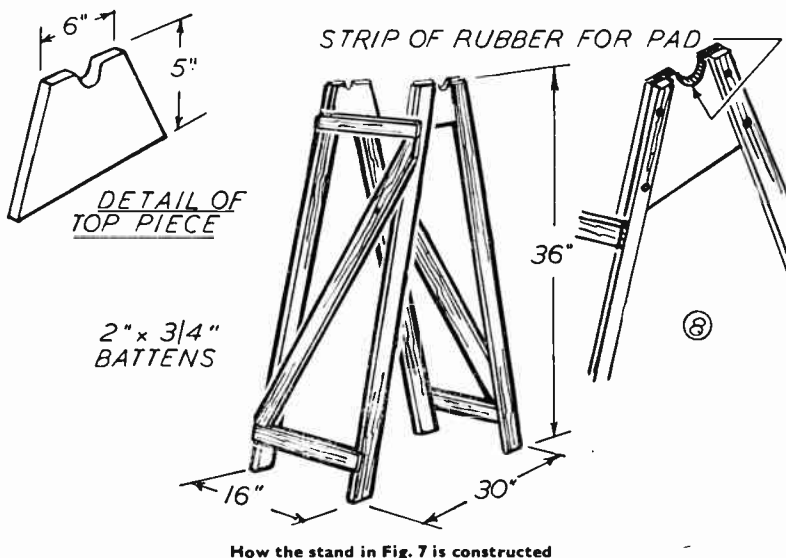
Bearing in mind that the dimensions are approximate only, especially in regard to the suggested section of the wood, the reader-constructor will have little difficulty in making this stand which is mostly of the 'hammer and nails' variety of carpentry, though screws are much advised for fixing the keystone-shaped pieces at the top, as there is a fair amount of strain here. It is not possible to brace the lower ends so that each end looks like a letter A.

It may be mentioned in passing that the top pieces may be bolted on (to allow for dismantling when not in use, or for transport) or one side can be hinged, so that the whole folds fairly flat. But in the rigid form illustrated, the cycle 'horse' served the present writer well for years.

Built-in or attached stands have never

been popular with cyclists, at least, pedal cyclists, though motor-assisted cyclists may have to revise their ideas on this. But there must be, at the very

minute, thousands of cycles leaning up against walls when, at quite small cost in time and money, an efficient stand could be made. (406)



How the stand in Fig. 7 is constructed



Is It Possible?

I HAVE a $\frac{1}{4}$ h.p. 340 volt 5-phase electric motor, and would like to know whether it is possible to run same on 230 volt single phase. (E.G.—Stapleford).

EXACT details would depend upon the individual motor. In some cases, such operation is possible, the motor being worked from A.C. and the 3rd phase winding being supplied through a fairly large condenser, which due to its method of functioning, will result in a phase-shift in the current. Such an arrangement is, however, only an adaptation, and though it can be used successfully with some motors, may not necessarily be suitable for the type you have. Experiment might prove it to be suitable; if not, and in view of the low cost of ex-service motors, it might be more economical for you to put the motor aside and purchase one suitable for your supply.

House Wiring

CAN you tell me where I can obtain a copy of the B.S.S. specifications for house wiring. At present I am running my own small generating plant but we are getting the mains installed this year, and I think I may possibly be able to use some of my present wiring if I can get it to conform with the specifications. (H.G.—Blisland)

NORMALLY B.S.I. or similar single strand cable, should be used for all 5 amp. circuits, and 3-strand for 15 amp. points, with third, earthed point at the supply wall-sockets. Correct fusing at the mains side is also necessary. However, local by-laws are not standardised on this subject. In some cases existing fire-insurance policies on the property do not permit of any permanent amateur-installed wiring; in other cases, the electrical company may insist that all wiring has to be carried out by a certificated electrical-engineer. In view of these facts, it would be wise for you to check these points locally, to avoid wasting money on wiring which will have to be re-done to conform with regulations. In some cases, the fact that the wiring installed by the householder is safe and properly carried out is not a guarantee that it will be considered satisfactory.

Flue for Gas Cooker

IN my kitchenette I have fixed a contrivance above the gas cooker to take away the steam—an idea based upon that seen in a fried-fish shop. I have made two or three different kinds of vents or flues, but to no avail; instead of the draught pulling the steam outside, all I get is a draught blowing back. I would be deeply indebted

to you if you could help me in the matter of making the correct type of flue. (W.C.—Dagenham).

PROBABLY the best results will be obtained if you close up the main flue outlet where it emerges from the wall, except for the necessary opening for a $3\frac{1}{2}$ ins. or 4 ins. diameter stove pipe, which you should carry up for as high as possible—not less than 10ft. and fit a 'baffle' to the top. The baffle can be similar to those supplied for the vents to a gas geyser or the like. Take care to make sure that the flue is air-tight, by luting all joints with fireclay or other suitable means. The stove pipe can be of galvanised iron or asbestos-cement which is most convenient. This arrangement should ensure sufficient difference of temperature between that of the heated air at the bottom, and that at the top of the flue to cause a steady up-draught.

Colouring A Cement Floor

PLEASE advise me how to colour an ordinary cement floor, also what colour to use? The walls and paintwork are cream and green. It is a kitchen floor, with only a gas stove and gas copper in it. I would like a colouring that would polish; I do not want to mix a coloured cement and paste over the top. (W.B.—Saxmundham).

THERE are numerous proprietary brands of tile cement and lino paints on the market, and any of these would answer admirably for painting an ordinary cement floor. They dry in a few hours, and harden in less than 24 hours, and are very easy to apply. Furthermore, they can be polished with any ordinary floor polish. As regards colour, we suggest a nice rich red-brown would look well, and afford a pleasing contrast to the cream and green walls.

Just the thing for youngsters— A PARACHUTE 'GUN'

ARATHER old-established toy, this, but one well worth reviving occasionally. It consists of a gun arrangement, something like a catapult, for the purpose of firing a parachute in the air, which slowly descends in true parachute fashion. It is quite easily made, and would interest and amuse some younger readers of the paper.

The parachute is a circle of thin material fastened to a stick. Any light material would do, and if a small piece of the real parachute stuff which is now on the market can be obtained, it would be difficult to find anything better. This is cut to a circle, the size given in Fig. 1,

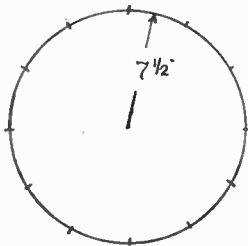


Fig. 1—The circle of the parachute

plus $\frac{1}{4}$ in. all round—in short $15\frac{1}{2}$ ins. diameter. The odd $\frac{1}{4}$ in. is stitched all round as a hem. Mark the centre, and at regular intervals all round the edge, make marks with a pencil. On these latter marks, tie lengths of strong thread, about 13 ins. long.

For the stick, a light piece of bamboo could be utilised, or a length of round wood curtain rod, not more than $\frac{3}{8}$ in. thick. Cut it to the length given at (B) (Fig. 2). Now fix the parachute material to the top of the stick, at its centre, of course, with a spot of glue and a drawing pin. Draw the threads down, and cut all to the same length. Provide a certain ring, not more than $\frac{1}{2}$ in. inside diameter, and tie the threads to the ring, so that when the latter is drawn down, it reaches to about 4 ins. from the bottom. The completed parachute will then present the appearance of (A), and be ready for making its first flight, as it were, when a stop-ring is fitted.

The Stop-Ring

The stop-ring can be a piece of metal, which is bent round the stick, a few inches above the ring, to prevent the latter being drawn up too far. It should be fixed with a small screw so that some adjustment of its position can be made.

Now for constructing the 'gun', which propels the parachute into the air. This is shown at (C) (Fig. 3). The tube can be of metal, not less than 1 in. internal diameter; a light tin tube would suffice.

Failing that a cardboard postal tube would serve, or a tube of brown paper, glued and rolled round a broomstick. If a postal tube of approximately the given diameter can be obtained, some trouble will be saved. It may be necessary on account of the length, to buy two tubes and cut one down to requirements, then to glue both together, a job easily done by gluing and rolling a sheet of stiff paper round both to join them.

If the brown paper tube is decided upon, wrap a single thickness of newspaper round the broomstick first. Then roll the brown paper round once over that, glue the remainder and roll up,

through the centre and tight fit over the tube. Glue it firmly in position. At each end, drive in a small screw eye, and to these, stretch across a length of catapult elastic. Use the elastic double, that is to say, pass a single thickness through both eyes and then knot the elastic together, leaving a double strand across. Give the gun a coat of varnish, it keeps out wet, and stiffen the tube as well.

Now give the parachute its first flight. Roll it up round the stick, like an umbrella, and push it down the tube. Grip the bottom end and elastic together and draw down, then release. The parachute will be shot some distance upwards, and then should open and gracefully descend. If a notch or groove is filed in the bottom end of the parachute, the elastic will grip better, and not tend to slip off. If it develops an inclination to turn over and drop, instead of opening, then ballast the lower end with a little weight, which should cure the trouble at once.

The dimensions given are not by any means to be considered final and definite. The parachute can be made smaller or larger, and the gun amended to suit, and should act quite as well. In fact, additional interest may well result if some experiments in sizes are carried out. (395)

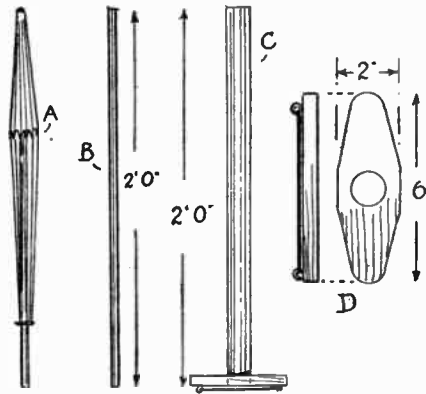
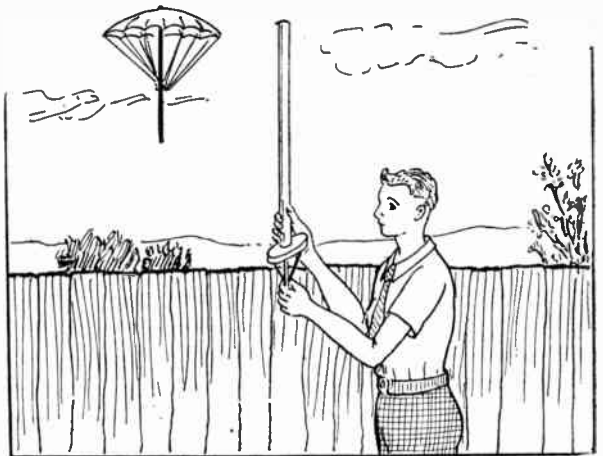
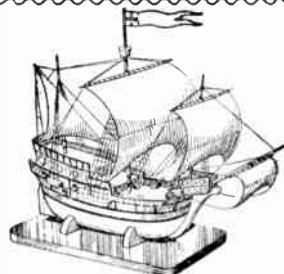


Fig. 2—How the parachute is drawn over the stick

Fig. 3—Details of the 'gun'

then slip off the broomstick and leave for a few hours to dry. A strong tube should result. To this, at the bottom, a wood fitting, shown separately at (D), is to be glued.

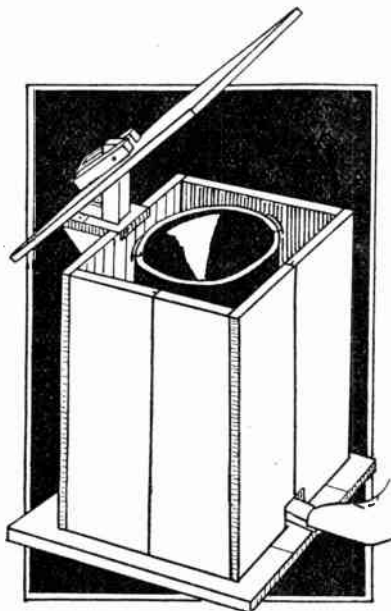
This is cut to the shape given from $\frac{3}{8}$ in. thick wood, with a hole bored



THE 'MARY FORTUNE'

This picturesque galleon, which is the subject of this week's free design sheet (No. 2914) makes one of the most attractive miniature models you have ever seen. The necessary materials can be obtained from Hobbies Branches or from Hobbies Ltd., Dereham, Norfolk for 5/- post paid.

Convenient and clean is this FOOT-OPERATED KITCHEN TIDY



THE useful little tidy illustrated here will save many steps in the kitchen, and is convenient in use, since the lid opens and closes by operation of the foot-pedal only, leaving both hands free. It can easily be made up from tongued and grooved matchboarding, which is obtainable quite cheaply, the actual size being made to accommodate whatever internal canister is used.

An Old Oil Drum

The canister was, in the writer's case, cut from the bottom part of a round 1 gallon oil drum, and measures 8ins. in diameter across the base, the top being cut away to leave a height of 9ins. As the can will be emptied into dustbin or incinerator at frequent intervals, there is no need for it to be very large; so the measurements given will allow for a can of about this size, though they are easily varied to suit any other can, if this is procured first.

Tongued and grooved boards are sold in various widths, but those used in the illustration gave a width of about 5ins. excluding the outside tongue and groove. With these, two boards are sufficient for the front, back and sides, the lid and base being made up of three. Wider boards would, of course, allow of all the pieces being made up from two widths, and narrower ones will need three boards for all the pieces. The 5ins. boards are usually $\frac{5}{8}$ in. thick, and this has been allowed for in the measurements given. Apart from the matchboarding, the only other wood required is a short length of 1in. by 1in. and an oddment of 2ins. by 1in. or similar.

Cut off the matchboarding to the required lengths and glue together as necessary. Then, when the glue is dry, plane off the outside tongue and groove, and continue planing down until two sides measure $13\frac{1}{2}$ ins. by 10ins., two $13\frac{1}{2}$ ins. by 9ins., the lid $13\frac{1}{2}$ ins. by $12\frac{1}{2}$ ins., and the base 15ins. by $12\frac{1}{2}$ ins.

Foot-bar and Bracket

Fig. 1 gives a general view of how the foot-bar and rod operate the lid. The foot-bar is a piece of the boarding sawn down to 2ins. wide and is $14\frac{1}{2}$ ins. long. The foot-bar bracket will be seen at Fig. 2. Cut the piece of 2ins. by 1in. to a length of $2\frac{1}{2}$ ins. Then cut a slit out at one end measuring 1in. long and $1\frac{1}{2}$ ins. wide. Measure 5ins. from one end of the foot-bar, draw a line across with the set square, then move the square up $1\frac{1}{2}$ ins. and mark across again. Between these two lines, reduce the width of the foot-bar to 1in. by cutting away the two side pieces, ready to fit it between the slot in the bracket. Then drill a hole

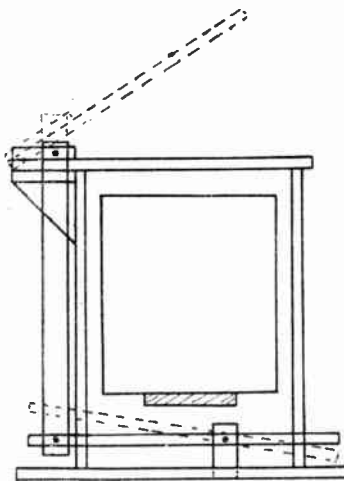


Fig. 1—Showing how the foot-bar and rod operate

through both bar and bracket for a bolt of about $\frac{1}{8}$ in. thickness.

Next, cut a slit in the foot-bar at the other end, 2ins. long and $1\frac{1}{2}$ ins. wide, to take the bottom end of the rod. This rod is cut from the 1in. by 1in. and is 14ins. long. Bore holes through the rod and this end of the foot-bar for the bolt that will hold these two together.

The next job is then to cut the slits in base, front and back. Beginning with the base, cut a slit 2ins. by 1in., $5\frac{1}{2}$ ins. from the front edge, for the foot-bar bracket. Then cut a slit in the front 2ins. long from the bottom edge and $2\frac{1}{2}$ ins. wide, and in the back $3\frac{1}{2}$ ins. by $2\frac{1}{2}$ ins. for the foot-bar to project through at both ends. A similar slit 2ins. long from the back edge and $1\frac{1}{2}$ ins. wide has to be cut out of the lid, where the lifting rod will come

through. Cut two pieces of the 1in. by 1in. each 2ins. long, bore a $\frac{1}{8}$ in. hole through them $\frac{1}{8}$ in. from the end that will be nearest the front, then screw them down on the top of the lid with the back flush with the back edge of the lid, one on either side of the slit cut in the lid, as seen at Fig. 3.

CUTTING LIST (for wood $\frac{5}{8}$ in. thick)		
No. of pieces	Description	Size
1	Base	15" × 12 $\frac{1}{2}$ "
2	Sides	13 $\frac{1}{2}$ " × 10"
2	Sides	13 $\frac{1}{2}$ " × 9"
1	Lid	13 $\frac{1}{2}$ " × 12 $\frac{1}{2}$ "
1	Foot-bar	14" × 2"
1	Foot-bar bracket	2 $\frac{1}{2}$ " × 2" × 1"
1	Lifting rod	14" × 1" × 1"
2	Rod top pieces	2" × 1" × 1"
1	Hinge board	3 $\frac{1}{2}$ " × 2 $\frac{1}{2}$ "
1	Canister support	9 $\frac{1}{2}$ " × width of board
2	Hinge board supports	2" × 2"

The hinges are carried on a piece of the matchboarding $3\frac{1}{2}$ ins. by 2ins. projecting out from the back of the case. So cut this next, and cut out of the back, at the top edge, a slit $3\frac{1}{2}$ ins. long and $\frac{1}{8}$ in. (or whatever width the boards are)

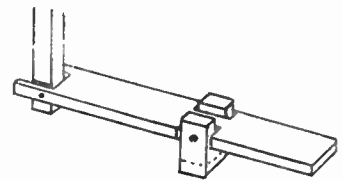


Fig. 2—The foot-bar bracket

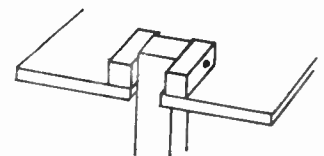


Fig. 3—Arrangement of the lid

deep, to take this hinge piece. It is supported by two little triangular pieces 2ins. by 2ins., as shown at Fig. 4. Finally, cut a hole $1\frac{1}{2}$ ins. by $1\frac{1}{2}$ ins. in the hinge board, for the rod to come through.

Assembly

Having cut and cleaned up all the pieces we can get to work on the assembly. Screw the back and front to the two sides, and glue the foot-bar bracket into the hole cut for it in the base. Then screw down the carcass on to the base, with the base projecting 2ins. at the front and 1in. at each side. Fix the foot-bar into its bracket with a nut and

(Continued foot of page 330)



The SHIPMODELLER'S Corner



ANY fitment designed to draw off stale air on board ship can be termed a ventilator. Most of them are stationary but some are adjustable, and can be turned to utilise the breeze from any quarter.

The most familiar type is the funnel shaped ventilator and their addition, nicely modelled to scale, will do much to improve the appearance of your model. The construction of this type can be undertaken in several ways, and that best adapted to the scale of your model should be adopted.

For small scale models the most effective method is to cut them out in

Ventilator Types and their Modelling

By 'Whipstaff'

profile from a suitable thickness of wood, with a fretsaw, and then file them to shape. A small drill can then be used to drill the mouth to a sufficient depth to give a hollow appearance.

Except on very small models this type of vent is improved by the addition of a rim around the mouth. A thin strip of paper glued around will make the rim (Fig. 1).

For larger models, use a small block of wood for the funnel head, bore a hole in the bottom and glue in a piece of dowel of the right diameter for the shaft. When set, carve the head to shape and merge it into the shaft, again hollowing out the mouth and adding the rim around the mouth (Fig. 2).

Another method is to use copper or brass tube of the diameter of the shaft, cut partly through in a 'V', as in Fig. 3. Bend over the head and solder in position. Use a sharpened piece of dowel slightly larger than the diameter of the tube and tap this in to bell out the mouth slightly.

Clean up with a file and you have a nicely modelled hollow ventilator.

In some large working models I have seen briar pipe bowls used very effectively for ventilators.

Let us now turn to some of the modern types of ventilators, our first being the rectangular curved type, akin in shape to the crooked handle of a walking stick.

In small models we can again use the fretsaw to cut them out in profile and it only needs the addition of paper edges for the mouth rim and the moulding around the base. If the size permits, a grill should be painted on the mouth (Fig. 4).

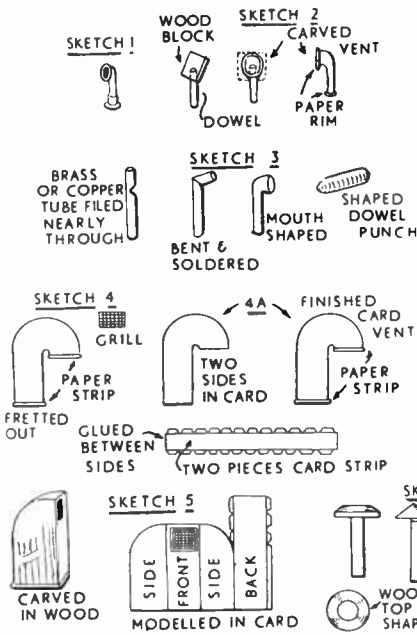
For large type show models they can be modelled in bristol board. This gives a hollow ventilator of good strength when coated with shellac before painting. First cut two sides exactly alike and then two strips for back and front, leaving on these two latter items small tabs for gluing. These strips can now be glued between the sides, a painted grill glued to the mouth, and bottom moulding and mouth rim added with paper strips (see Fig. 4A).

The modern straight upright ventilator can be made of bristol board or cut out with the fretsaw from wood of a suitable thickness (Fig. 5).

Small cap ventilators, seen so much on pleasure steamers like the 'Royal Eagle', can be turned from suitable brass rod, or made from wire with gummed paper strip wound around the upper end and shaped.

In large models they can be turned from boxwood or holly, or assembled by using a small block of wood glued to a piece of dowel for the shaft and then filed to shape (Fig. 6).

The very small types of vents used on shipboard for galley vents, etc., can be assembled from wire for small models, or from dowel for larger scale work. (374)



Foot-Operated Kitchen Tidy—(Continued from page 329)

bolt, not forgetting a washer each side between bar and bracket and with one end of the bar projecting through the front and one through the back.

Screw the hinge board down on to the top edge of the back and the two supporting triangular pieces underneath it, then fix the lid on with a pair of hinges set on the extreme back edge of the hinge board, as seen at Fig. 4.

The Lifting Rod

Close the lid and thread the lifting rod down from the top, through the slit in the lid and fix the bottom end into the slit in the back end of the foot bar with another bolt. When in position, the holes bored in the pieces of 1in. by 1in. on the top of the lid give the position for the hole in the top of the rod,

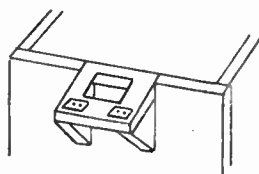


Fig. 4—The back, showing the hinge board

through which a bolt holds rod to lid.

Now try out the foot bar by depressing it at the front end, making any adjustment in the bolts that may be necessary to ensure the lid rising and falling as the pedal is pressed and released.

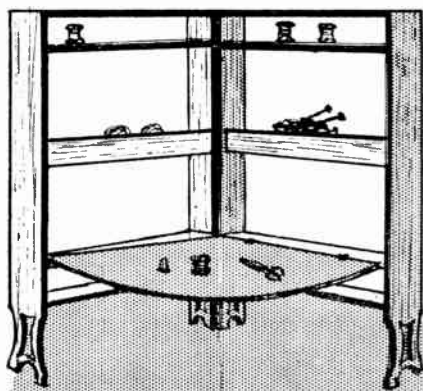
The Canister

Cut the top off the oil drum and

smooth up the edge. Thoroughly remove any oil or dirt with spirit and then give the can a coat or two of black enamel or paint. Make a hole near the top on either side and fix a simple handle of stiff wire, making it big enough to hang down by the side of the can when not in use.

Then try the can in the case, and screw a piece of the board across the inside of the case, clear of the foot-bar when in its highest position but low enough to allow the top of the can being $\frac{1}{2}$ in. from the top of the case, when the can rests on the board. Go round all the edges of the case with spokeshave and glasspaper, then finish off with a coat or two of white enamel or paint. (408)

Full details for a ladies' SCREEN & WORK CABINET



Cut the bottom 6ins. to the shape shown in the side view Fig. 2 to make the feet.

Two pieces 20ins. long, 3ins. wide and $\frac{1}{2}$ in. thick are needed for the top and bottom bars to complete the framework. The top bar is dovetailed into the sides, while the bottom bar has a mortise and tenon joint. Fig. 3 shows the lay-out of the dovetail joint, and for this no special measurements are really necessary if you follow out the general idea as shown.

For the mortise and tenon joints of the bottom bar, Fig. 4 gives the approximate sizes to make them. They can be cut right through

the side pieces, but a better job will be made by going about three quarters of the way, thus leaving the outside surface clear of holes. This latter method will not interfere with the strength of the framework to any marked degree and makes a much more workmanlike job.

close when the flap is lifted up. Make this shelf 2 $\frac{1}{2}$ ins. wide and the length will be 19 $\frac{1}{2}$ ins., which will be the same for all the other shelves.

Near the top of the screen is a shelf suitable for cotton reels and other small odds and ends. From 3ins. to 4ins. would be a handy position for this.

About midway between this shelf and the flap shelf is a receptacle for pieces of material, skeins of wool or for the work in hand. It is made up of a shelf with a wide strip of wood along the front to hold the goods in place. A piece of $\frac{1}{2}$ in. plywood is suitable for this front strip, and the width can be about 3ins.

Do not forget to make all the shelves on the flap side about $\frac{1}{2}$ in. narrower than those on the other half so as to leave room for the flap when closed.

Assembly

Having got all the shelves cut to size and the grooves made, the framework of both halves can be glued together and the shelves fitted in. The ply panels can then be glued and tacked on to this framework, using very fine panel pins. Punch them in slightly, and smooth over the holes with wood filler.

The thickness of the wood panels can be somewhere round about $\frac{1}{2}$ in., but this is not an important point. Cut the panels slightly larger than 20ins. wide and 24ins. deep, then the rough edges can be planed and smoothed down with glasspaper after fixing on to the framework. This method ensures a much better and smoother finish than by

THE subject of this article is an attractive piece of furniture that will appeal to the keen needleworker. When closed up, it forms a double sided fire screen, each side of which may be decorated in a different manner.

Inside, there is ample room to store away the many tools and materials needed for needlework, which, when the case is opened, are all in a handy position for the work in hand. A substantial flap lets down and forms a useful bench to work on at a height convenient for making it an easy-chair companion.

Other Uses

Besides its use as a needlework cabinet, the interior fittings could be arranged to house notepaper, envelopes and all the kit needed for writing, or the drawing materials used by the artist.

The keen stamp enthusiast could, no doubt, make it into a cabinet to house his collection, and all the odds and ends associated with it.

The sizes given here are for an average size screen, but these may be varied slightly to suit the needs of the maker.

The choice of wood will be governed somewhat by the final finish required. The large panels forming back and front are of plywood, and this is obtainable now in quite a variety of woods.

If the screen is going to be painted or enamelled, ordinary plywood can be used and the framework made of whatever kind of wood is available. A much better job, however, is made by using oak for the framework and oak faced ply for the panels.

The two halves of the screen are practically identical, the only difference being a slight variation in the height of one of the interior shelves. It will be necessary, therefore, to describe only the making of one of the halves.

The two side pieces of the framework also form the screen feet, and are 30ins. long, 3ins. wide and $\frac{1}{2}$ in. thick.

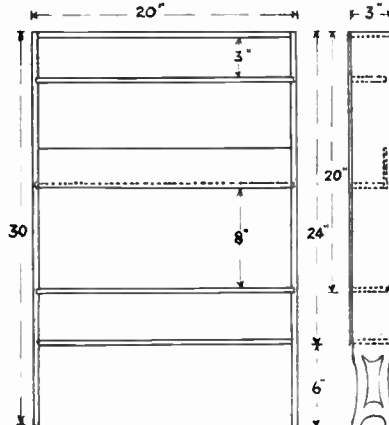


Fig. 1—Front elevation, giving measurements

Fig. 2—Side elevation

Fig. 3—The dovetail used for the top bar

Fig. 4—Joint for the bottom bar

The internal shelving can be cut to length and just pinned in, but it would be better to groove them into the sides. If this method is adopted, the grooves must be cut before the framework is glued together.

The lowest shelf on the right hand half of the screen is 4ins. from the bottom, and it is to this shelf that the flap is hinged. The shelf on the left hand side is placed $\frac{1}{2}$ in. lower so as to form a rest for the flap when lowered for use.

Do not make the grooves deeper than $\frac{1}{2}$ in.—a little less will be much better. All the shelves are cut from wood $\frac{1}{2}$ in. thick which is, therefore, the width to make the grooves.

The shelf that has the flap attached to it must be narrower than the 3ins. one on the opposite side, to allow the case to

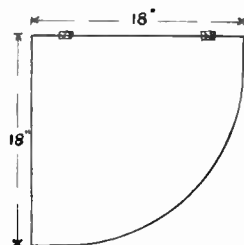


Fig. 5—Dimensions of the flap used as a work bench

cutting exactly to size and then gluing on.

As the flap is required to form a bench to work on it should be made from a nice flat piece of fairly substantial

(Continued foot of page 332)

You can easily make these PLASTIC SERVIETTE RINGS

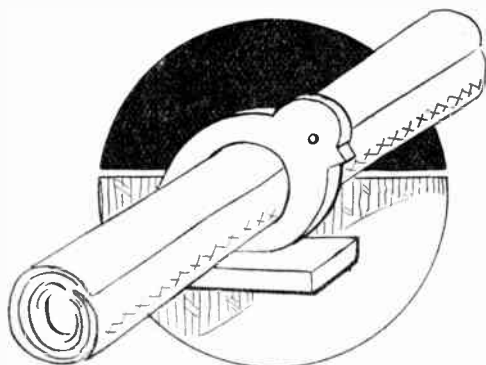


Fig. 1—A finished ring

protective paper covering the sheet.

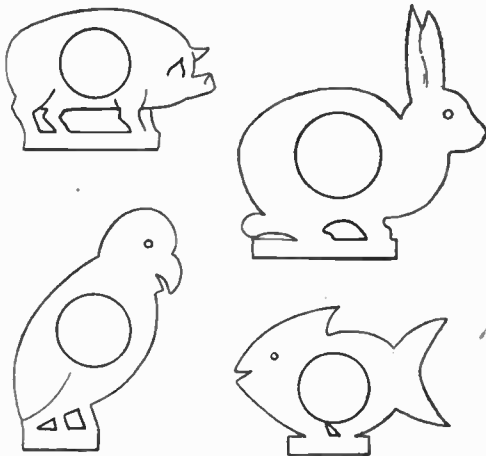
Next drill a small hole for the eye. Cut off a small piece of coloured plastic rod of suitable diameter to make a tight fit in the hole. This will later be filed down flush with the surface.

Now drill another small hole inside the cutting line of the circle and cut out the centre portion. This cutting out is best done with a coping saw, but can be managed quite well with an ordinary fretsaw. It will be wiser to cut slightly off the line and later clean down to the pencil mark with a file, finishing off with Grade O and OO glasspaper.

Finally, cut out the shape of the animal, being very careful with the tenon at the base. Here again, saw slightly off the line and finish off accurately with a file. Use the file horizontally and obliquely.

The Base

Mark out the base to the desired size



Some suggested shapes for rings

and cut out the mortise *before* cutting out the base itself from the sheet. Use the same sawing and filing process as before. Very great care must be taken over the cutting out of the mortise and tenon, as these must be an exact fit.

There is no 'give' in a plastic material as there is in wood, and forcing in the tenon will split the base. On the other hand, a loose joint will stay loose, as it cannot be plugged as a wood joint is plugged when loose.

Cementing the Joint

The cement used for making the joint permanent will depend on the plastic used. For Perspex choose 'Diakon' cement No. 2.

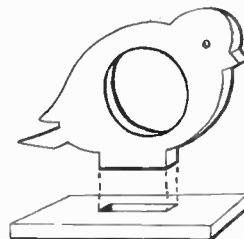


Fig. 2—How the article is assembled

For Catalin or Lactoid use ordinary woodworker's glue or a cold water glue such as Lactocol.

Leave for 12 hours and then saw off any part of the tenon that is projecting right through the base. File to an even finish and then glue a piece of baize to the underside of the base. Trim the baize to size after the glue has set.

Polishing

All the plastics can be polished by hand but a power-driven polishing head will, of course, give quicker results.

First of all remove all scratches with glasspaper. Use a wooden block behind the glasspaper to keep the edges square, and use a circular motion for the surfaces.

Pumice and Damp Cloth

Follow the glasspaper with pumice powder and a damp cloth, and after this give a gentle rubbing with a metal polish such as Brasso. Finally rub gently with some dry clean cotton wool.

If Perspex has been used, two special Perspex polishes can be bought, No. 1 for removing scratches and No. 2 for giving the finishing polish. (372)

PLASTIC serviette rings are a novel and most pleasing addition to the table. They can be made in a variety of colours, or, if desired, from the brightly clear, transparent Perspex.

A high class finish can be obtained without the use of any special tools. In fact, the two most important things are the care taken in the cutting out, and the patience taken in the cleaning and final polishing.

Choice of Material

There is a wide range of plastic materials now on the market under a variety of trade names, but for the making of these rings the hobbyist might well choose one of the following three plastics: Catalin, Lactoid and Perspex. Perspex is the glass-like material; Catalin and Lactoid may be had in numerous colours. But whatever the choice, the plastic sheet should be about 8 mm. thick.

Marking Out the Work

Figs. 1 and 2 show clearly how the rings are made, the animal shape being fixed to the base by means of a mortise and tenon joint.

First of all mark the chosen shape on to the plastic sheet by means of a sharp pencil or a scriber. If Perspex is being used the shape can be drawn on to the

Screen and Work Cabinet—(Continued from page 331)

plywood. About 1/4 in. would be a good thickness for the job. Cut it to the shape shown in Fig. 5. The two sides at right angles to each other are 18 ins. long. Finish off with a nice curve, the edge of which is well rounded and smoothed with glasspaper.

The flap is attached to the shelf with a pair of strong brass hinges. A pair of

hinges will also be needed to fix the two halves of the screen together. These can be somewhat more substantial than the others.

After well glasspapering, the woodwork can be stained and polished or finished as desired. There are many ways in which the panels may be decorated. For instance, an overlay can be cut in

fretwork and glued on, or a transfer can be fixed in position. A really attractive design painted in oil colours is an ideal finish, and would add dignity to the piece of furniture. As already mentioned, different designs may be put on each side, or one side can be left quite plain. (377)

Books to Read!

A review of interesting books for craftsmen which have been recently published. Obtainable through newsagents or booksellers or direct from the publishers mentioned.

Crafts for the Home and School

by W. A. Stimson, R. E. Wade, J. T. Pretyman and A. Broday

THIS volume is the work of four Australians, but is none the less welcome here in England. The writers are lecturers in the manual arts at the Teachers' College, Sydney and their style is clear and precise. Any home craftsman interested in the construction of wooden toys or such hobbies as the binding of books, or the making of cane baskets, will find a wealth of information, new ideas and practical instruction within its pages. The book is of especial interest to the potential and the practising teacher, as it provides adequate and carefully graded schemes of work suited to the varied and exacting needs of schools and all Teachers' College students. Published by George G. Harrap & Co. Ltd., 182 High Holborn, London, W.C.1 in association with the Australasian Publishing Co.—Price 12/6.

Air Apprentice, Air Mechanic and Air Navigator

THIS is another of the booklets in the Scout Badge Test Series, and has been prepared and approved on behalf of the Boy Scouts Association by the general editor of the series. Scouts will find in it all they need to enable them to gain the badge. It is written in the same style as earlier booklets in the series, and can be recommended.

Published by Brown Son & Ferguson, 52-58 Darnley Street, Glasgow, S.1—Price 1/-.

Raffia Work

By Rosemary Brinley

IT is timely that Messrs. Foyles, in their Handbook Series, should have published this book on raffia work, for this is a craft which is having something of a revival these days. The craft is not a new one, and the material has not changed since it was first used in this country many years ago. Any recent improvements are mostly in the changing trend of design rather than in the material itself, or in the working methods. Working in raffia can be interesting and profitable and the book provides all the information required to commence in this pleasant craft. It can be practised by workers of all ages and is a clean occupation.

Published by W. & G. Foyle Ltd., 119-125 Charing Cross Road, London, W.C.2—Price 2/6.

The Amateurs' Microscope

By R. F. E. Miller

FROM Messrs. Percival Marshall comes a book designed for those who have recently acquired a microscope, or who intend to do so, and need help in understanding its best use and the mechanics and purpose of the instrument and its various parts. In an easily understood style, the author gives us a brief history of the microscope and then a detailed description of the modern instrument in its varied forms, a section on simple optics, and details of various accessories commonly used with the microscope. Later in the book the author explains the use of the microscope, including advice on such important matters as illumination, focusing the use of oil immersion lenses, recording observations, drawing and photomicrography. Best of all for the home craftsman is the inclusion of chapters on the making of your own apparatus.

Published by Percival Marshall & Co. Ltd., 23 Gt. Queen Street, London, W.C.2—Price 7/6.

Paper Craft

By Edward Kitson

THIS is yet another title to be added to the ever-growing list of Foyles popular handbooks, and should receive a ready welcome from all who enjoy working with their hands. It is surprising what a great number of things can be made with such a simple material as paper, and that the craft of working paper has so much scope and interest.

The author describes the making of such articles as lampshades, firescreens, pictures of all kinds, bowls, trays and boxes, artificial flowers, bracelets and brooches. And he gives precise details of how the material is formed, shaped, finished and decorated. There are plenty of illustrations to help the craftsman, and considering the small layout required for his raw materials (his discarded newspapers can all be used) anyone who takes up this craft should find interest and satisfaction. Published by W. & G. Foyle Ltd., 119-125 Charing Cross Road, London, W.C.2—Price 2/6.

British Plants and Their Uses

By H. L. Edlin

HERE is a book which, despite its high price, should not be missed by anyone who has an interest in plants. Mr. Edlin, who is known for his *British Woodland Trees, Forestry and Woodland*

Life, etc. reviews in this book the whole range of useful plants both wild and cultivated which flourish in Britain today. He has broken away from the conventional practice of drawing a sharp division between wild and cultivated plants and has largely ignored the still more artificial distinction between native and introduced kinds. He has, in fact, approached his subject from the human angle, and has grouped the plants, not according to the formal arrangement of the systematic botanists, but by their uses. And in so doing he has given a clear and interesting account of some 450 distinct species, bringing out the relationship of each to others that have allied uses. The book is profusely illustrated in line and half-tone, and there is an adequate index.

Published by B. T. Batsford Ltd., 15 North Audley Street, London, W.1—Price 15/-.

How to Build that Garage-Workshop

By T. E. Dutton

MANOTHER must have wanted to build such a garage-workshop as described in this book, and have been deterred by scarcity or restrictions, or both. Then again, to the person with previous experience, the task of building a garage particularly in bricks and mortar might appear a formidable one. But this book shows that it is by no means beyond the capacity of the average person to build such a garage. The principal materials used were breeze-blocks, some bricks, and corrugated asbestos cement sheeting. Altogether the garage-workshop is an attractive piece of work, and any who need such an item would do well to get a copy of this book.

Published by Percival Marshall & Co. Ltd., 23 Gt. Queen Street, London, W.C.2—Price 5/-.

Wood Turning Designs

By E. A. Dingle

THIS is one of the well-known Woodworker Handyman Series, and should enjoy the popularity of its predecessors. As with all this firm's publications, the drawings are adequate and well executed, and the instructions are precise. There are many clever designs, and for the man with a lathe this is a book which ought not to be missed.

Published by Evans Bros., Ltd., Montague House, Russell Square, London, W.C.1—Price 3/6.



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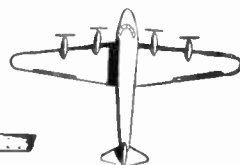
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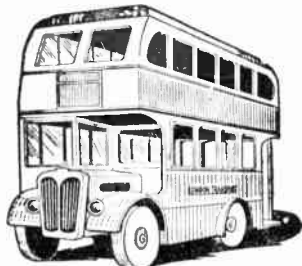
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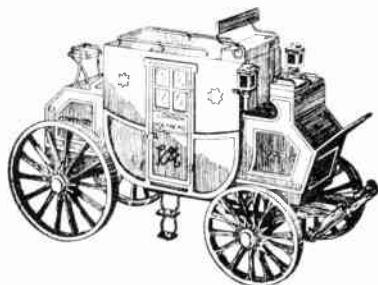
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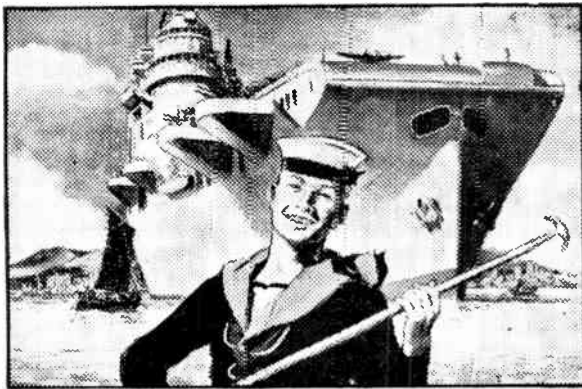
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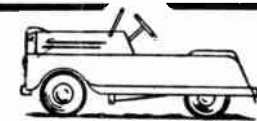
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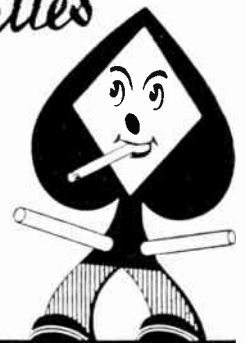
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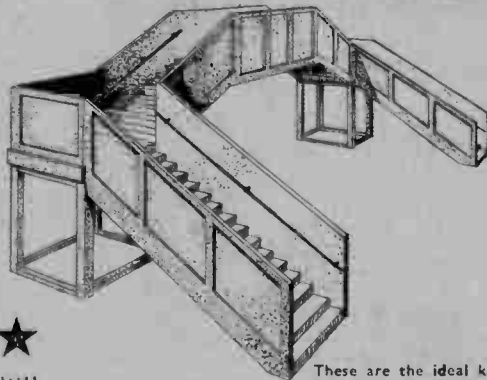
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Hobbies

WEEKLY

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September 12th, 1951

Price Fourpence

Vol. 112 No. 2915

Easy to make—a

SCOUT 'PUZZLE'

MONEY BOX

THIS is an interesting little puzzle money box which can be made from a few pieces of fretwood. It should please the Boy Scout because we see, standing guard over the box, the figure of a Scout in uniform, complete with pole, etc.

The slot for the insertion of the money is cut in the back of the box, but how about getting the coins out again? That

is just what will puzzle most Scouts until they are let into the secret.

From the smaller illustration in Fig. 1 the mystery is at once solved, and can be seen by the representation of the hand drawing down from the figure of the boy so that he assumes a sloping position and thus reveals the opening through which the coins fall.

Making the Box

Now to make the box, which is intended to hold only threepenny and sixpenny pieces. The size of the box is height $6\frac{1}{2}$ ins., and width 4 ins., while the depth, front to back, is 3 ins. The base of the box is formed of four mitred strips as (A) in Fig. 2, two strips being $4\frac{1}{2}$ ins. long and two strips $3\frac{1}{2}$ ins. long. Each end of these pieces is cut to an angle of 45 degrees, so that when glued up they form a true oblong. Wood $\frac{3}{8}$ in. or $\frac{1}{2}$ in. thick is used for pieces (A) as well as for the upper piece (B) which is glued to them. This piece (B) will measure $4\frac{1}{2}$ ins. by $3\frac{1}{2}$ ins. and will be cut as a solid oblong for the sake of strength and to form the floor of the box.

The front and back of the box are identical in size and shape, and the sizes are shown in Fig. 3. Note, however, that one piece—the front—has two openings cut in it as in the diagram, but the back had only a slot cut in it, being located near the top and measuring about 1 in. long by nearly $\frac{1}{4}$ in. wide. Both openings in the front are made 1 in. in diameter,

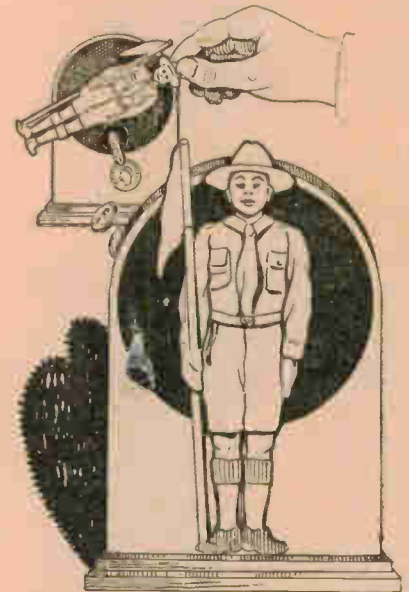


Fig. 1—The completed box—and how it works

and the upper disc is laid aside as it will be wanted again to glue to the back of the Boy Scout.

This disc is shown as (G) in the sectional diagram in Fig. 4. The lower opening in the front forms the door for the falling coins. The front and back of the box are connected up by two sides (E) in Figs. 2, 3 and 4, these two pieces being $3\frac{1}{2}$ ins. long by $2\frac{1}{2}$ ins. wide. They are glued between the front and the back uprights.

Next, draw out and cut two pieces as (F) in Fig. 5, and one piece as (H). All these pieces will be $\frac{3}{8}$ in. or $\frac{1}{2}$ in. thick. Glue the pieces (F) one to each of the inside of the front and the back, the front piece being shown in the sectional diagram. Fig. 2. Both these pieces act as formers to which the curved top of the box is glued and pinned (see Fig. 4) for the bent top. To make the top of the box

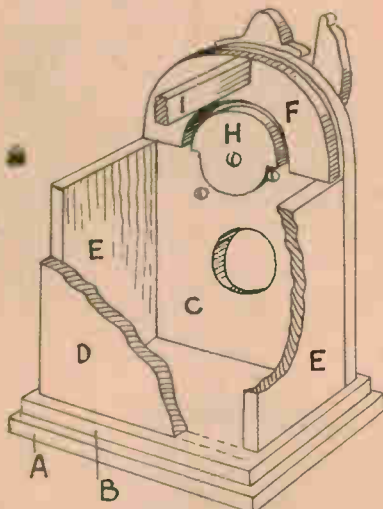


Fig. 2—A section showing constructional details

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

firm, a cross piece (I) (Fig. 5) is cut and glued in place.

Before the top of the box is prepared and fixed, certain work must be carried out inside the box, and to the figure of the Scout. Piece (G) must be accurately cut to move freely in the hole from which it was removed, and after testing this, and after cutting out the figure of the Boy Scout, the latter is stood in place on the front of the box, with feet resting on the top base (B).

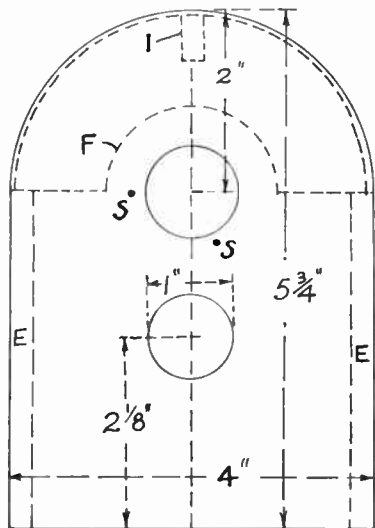


Fig. 3—Dimensions of the front and back

Insert disc (G) from inside the box, coating its inner surface with glue, and press it to the back of the figure and allow the glue to harden. See Fig. 7 for correct position.

The Figure

The figure of the Boy Scout can be enlarged to full size by first setting out the height of 6 1/2 ins. and dividing this into nine equal parts. Form 27 squares on a sheet of paper and proceed to follow each square of the diagram shown in Fig. 6. Transfer the outline of the Scout to 1/8 in. wood and cut it out with a fine grade fretsaw. Clean the back edges of the cut-out before gluing the disc (G) to it as shown by the measurements in Fig. 7. Now remove the figure from the front of the box and proceed to glass-paper the inside of the front round about where the disc (G) has been taken. This

is necessary so that when the figure is replaced, the disc (G) will project ever so slightly on the inside beyond the general surface. Therefore, when the piece (H) is attached to the back surface of disc (G), this latter, together with the figure, will turn in any direction needed.

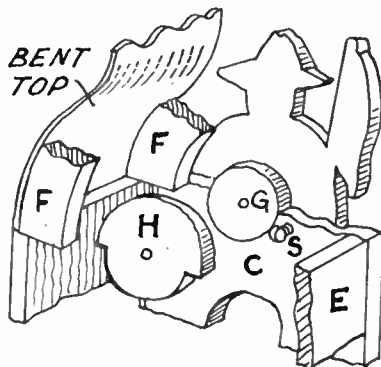


Fig. 4—Another sectional view



Fig. 6 The Scout in detail. Squares are 1/8 in.

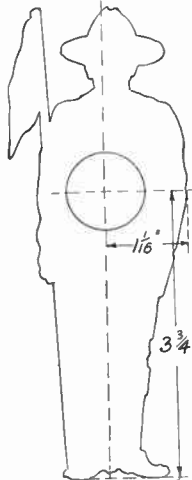


Fig. 7—Position of disc at the back of the Scout

In Fig. 4 the disc (H) is shown drawn away from the disc, but ready to be attached to it. Now note from Fig. 3 where the two 'stop' screws (S) are to be inserted. They prevent the figure from turning too far in either direction, and when the opening in the front of the box is wholly exposed, the figure should

automatically stop until it is again brought down at rest in its original standing position.

A 1/8 in. screw should be put through the part (H) and into disc (G) to make all firm, but this must not prevent the free movement of disc (G) in its opening.

The curved top to the box consists of 1/8 in. bendable wood. If this is used, note beforehand that the grain of the wood should run crosswise and not lengthways of the panel of wood. It may be possible to get a length of plywood which would answer the purpose admirably, and would not be so liable to split as the plain wood. Coat the curved upper surfaces of the formers (F) with glue and lay the top in place on them. One or two small brass fret pins can be driven in, if desired.

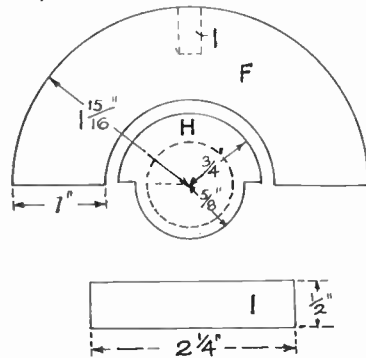


Fig. 5 The formers, disc and cross piece

The decoration of the box is simple. The front has a circle described on it with a radius of 1 1/2 ins. and the interior of this should be stained or painted black, or even brushed in with indian ink, which forms a good dense black surface. All the remainder of the box, including the base members can be simply stained to the depth required and just varnished over. The Boy Scout should be painted in orthodox Scout colours.

The markings such as sleeve creases, pockets, etc., can be put in with dark paint.

A final word might be given regarding the bent-wood top of the box. Roughly, the length of piece required will be 6 1/2 ins., and a piece this length should therefore be cut, with a full width of 2 1/2 ins. By cutting the top full in length, it may be neatly trimmed and cut to exactly on top of the two sides of the box (see Figs. 3 and 4). (442)

A Shell Frame—(Continued from page 339)

bottom of each compartment—coloured cotton wool for the white shells, so as to show them up. To each compartment, a label is added, describing the particular shell.

The shell collector need not fear losing enthusiasm on account of a limited range of shells, for there are over 350 different kinds of shells to be found in and around the British Isles—by the sea shore, in fresh water ponds (where they usually have to be dredged for) and on land (there are quite 40 kinds of snail shell, and the shells of each kind vary greatly). To identify these, consult

your local public library for a suitable book.

Shells, especially if inhabited, should be

placed in hot water. This not only evicts the tenant but cleans out sand, salt, mud, etc. (411)

Don't be Disappointed

Winter is approaching, and with it comes an increased demand for *Hobbies Weekly*. But the circulation is already higher than ever before—and paper stocks, these days, cannot be stretched indefinitely. To be sure of a regular copy, therefore, place an order with your newsagent while there is still time.

Preserve beach souvenirs in A SHELL FRAME

ON a visit to the seaside, the younger members of the family, especially, will make a collection of shells to bring home as souvenirs. Others may collect them in order to make the shell novelties that have been described in past numbers of *Hobbies Weekly*. (This is where the half-yearly index comes in handy!)

Novel Decoration

Usually, unless the shells are gathered for such a specific purpose, they are left lying about until one tires of them and finally throws them away. But, with a little effort, they can be made into novel and effective wall decorations—rather a far cry from the Victorian idea of sticking them around a picture frame or putty-ing them on to a piece of glazed drainpipe to make an umbrella stand.

The idea is illustrated in the drawing that heads this article. The shells are

through a frame so made, and provided with a plywood base is shown in Fig. 1.

Should this method be beyond the average reader, he can consider, among other things, the following:—

(a) Use a plain wooden box with square sides. This is not so good, as shells mounted on the sides cannot be seen to the best advantage. But it will serve at a pinch.

(b) Starting with a plain wooden box, add sloping false sides, one of which is seen in position in Fig. 6. It is an easy matter to fit in two such opposite sides. The other sides can be marked out by trial and testing, faulty jointing being easily hidden in the subsequent processes to be described. From the front, the effect is exactly the same as in the standard method, a slight drawback



the shells. If the tray-frame has been made in a more or less impromptu way, it will, perhaps, be best to cover the inside with an even layer of putty and then press the shells in gently. When this is dry, paint the putty with thin warm glue, taking great care not to get any on the shells, and then sprinkle clean dry sand over. (Silver sand is best, not builders' sand). When the glue has set, turn the frame over, so that loose sand falls off. The shells can be painted with gum, thinly, to give them a sparkle.

Waterproof Glue

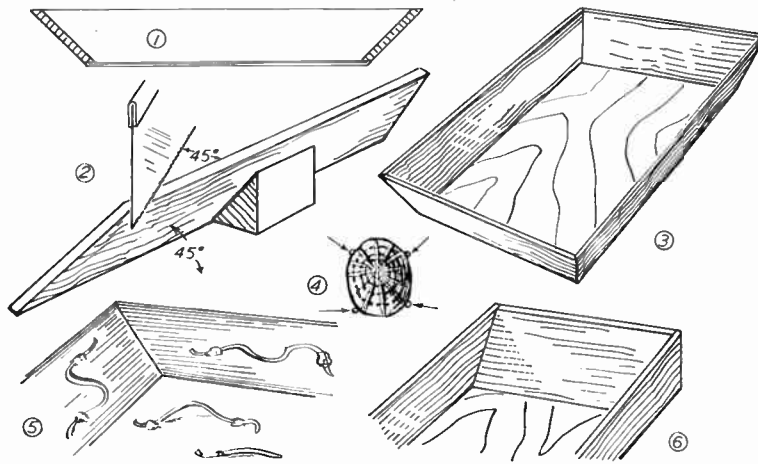
Better, however, is to use a waterproof glue and, afterwards, waterproof varnish so that if, in due course of time, the frame and contents get a bit grubby, they can be washed with soapy water, gently.

For a well-made wooden frame, however, with nothing to hide or disguise, the wood may be painted a sandy yellow or a light green-grey. The shells may be attached by means of very small panel pins driven right up against the rims of the shells (Fig. 4). A nail punch is needed here.

Colourful Picture

Such a frame makes quite a colourful picture for the wall and is not just a 'brainwave' of the author but a fully tested idea—one of the latest fashions in wall decoration. No glass is really needed. This would make it too much like a museum case. A vacuum cleaner will remove any dust. It must be emphasised that, as just described, the frame of shells is intended to be merely decorative and not scientific or instructional.

Should there be readers who fancy themselves as conchologists—that is, shell experts—a more formal display case may be indicated. Quite a useful one, however, can be made as in Fig. 7, using matchboxes large or small, wedding cake boxes or similar all-alike containers, glued together on a card base. A little cotton wool is placed at the



These drawings will help the constructor

mounted on a deep wooden frame which can be of any convenient size (12ins. by 9ins. would be a useful size). Such a frame has sides sloping at 45 degrees from the base, so that the frame is about 2ins. deep.

Fig. 3 gives some idea of the plain tray-like frame.

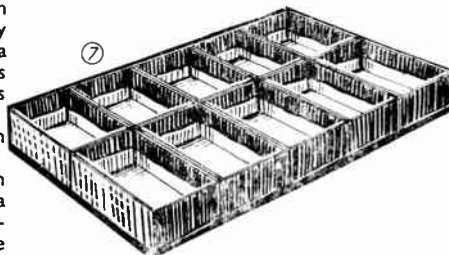
Admittedly, it is not the easiest job in the world to make such a frame in a pukka carpentry fashion and consequently, simpler alternatives will be described. But first—a suggested way of setting about the job.

This is indicated in Fig. 2. Here we see a triangular block of wood temporarily screwed to the side strip so as to hold it at an angle of 45 degrees one way. This done, the strip, with the aid of a large mitre box, is sawn at 45 degrees the other way and the temporary block then removed. It will be necessary to plane the top and bottom edges of the strip at a 45 degrees bevel. A section

being that the frame, viewed from the sides, with its square edges, is not quite so graceful.

(c) A metal cake tin with deep sloping sides can be used. It may be necessary to solder, very crudely, pieces of thick wire at random over the inner surfaces, to provide a 'key' for the putty to be applied (Fig. 5).

There are several ways of mounting



A useful display case

(Continued foot of page 338)

You will not be disappointed with this EFFICIENT MODEL GLIDER

DESIGNED on modern lines, this highly efficient model glider will prove excellent for sport flying and still be capable of holding its own against larger models in competition work. If built to fly in contests, make all the components as light as possible to keep the overall weight to the minimum figure. Duration should average about 60—70 seconds off 100ft. of line, with proportionately higher times when launched off longer lines.

The plans are reproduced one-third full size and it will be necessary to re-draw the wing and tailplane plans full size. This should not be difficult as main dimensions are given. Start construction with the fuselage.

The Fuselage

Mark out the shape of the fuselage bottom on a sheet of $\frac{1}{8}$ in. balsa, to the dimensions shown on the plan. Cut this out, then cut out a complete set of triangular formers, to the dimensions given in the table. The front former is cut from $\frac{1}{4}$ in. balsa, and all the others from $\frac{1}{8}$ in. Cement these formers in their appropriate positions on the sheet bottom, and between the third and fourth formers cement a piece of $\frac{1}{2}$ in. by

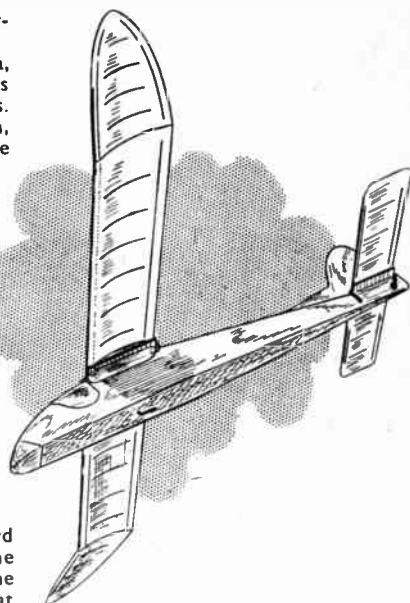
$\frac{1}{4}$ in. balsa, to which is bound the tow-hook, bent from 18 S.W.G. wire.

Mark out the sides of $\frac{1}{8}$ in. sheet balsa, and cut out. All necessary dimensions are given in the constructional sketches. Cement these sides in place, as shown, and to complete the fuselage, add the wing and tailplane platforms, from $\frac{1}{4}$ in. and $\frac{1}{8}$ in. sheet balsa, respectively, adding blocks under the wing platform to strengthen.

Cockpit

A cockpit can then be cut out and covered with thin sheet celluloid, or left open. The noseblock is carved from hard balsa and cemented in place. Fin parts are cut from $\frac{1}{8}$ in. sheet balsa, cemented together and then cemented to the fuselage. The whole fuselage assembly should then be covered with tissue and given three or four coats of dope.

The wing is a fairly straightforward assembly. The main centre panel of the wing is flat and is built directly over the plan. The tailplane is a similar flat structure with $\frac{1}{2}$ in. by $\frac{1}{4}$ in. balsa tips. Wing and tailplane ribs are cut from $\frac{1}{8}$ in. sheet.

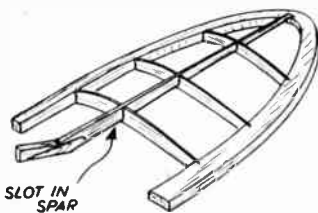
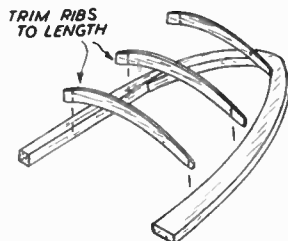
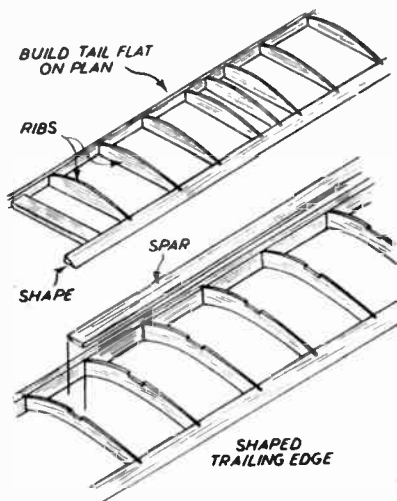


To build the tailplane, simply pin out the leading and trailing edge directly over the plan and cement the tips in place. Then add the ribs. When set, remove and glasspaper down and then cover with tissue. Waterspray and dope.

Wing Centre Panel

The wing centre panel is built in a similar manner, pinning down the leading and trailing edges and then cementing the ribs in place. The front of the leading edge will have to be propped up slightly to conform to the under-camber of the ribs. The spar is $\frac{3}{8}$ in. by $\frac{1}{8}$ in. arranged flat, instead of vertical. Cement this into the rib notches, after adding the auxiliary $\frac{1}{4}$ in. by $\frac{1}{8}$ in. spars across the centre of the wing panel.

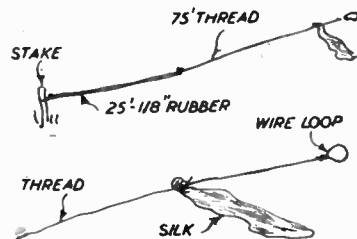
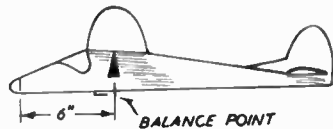
The two wing tips are built separately. Cut and pin out the outline, and then cut three ribs for each panel to the same shape as the main wing ribs but without



How the wing sections are built up

FORMER DIMENSIONS

Former ...	A	B	C	D	E	F	G	H	J
Vertical Height ...	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$2\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{1}{8}$	$\frac{3}{4}$
Base Width ...	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	1	$\frac{3}{4}$	$\frac{1}{2}$



Details of the launching gear

the spar notch. Trim these to length over the plan, cement in place, and notch to take the $\frac{1}{8}$ in. sheet spar. Note how the end of this spar is formed. The tip panels cement to the main wing panel with $3\frac{1}{2}$ ins. dihedral under each tip, the angled tip spar end cementing under the $\frac{1}{8}$ in. by $\frac{1}{8}$ in. flat spar. The wings are tissue covered in the normal way.

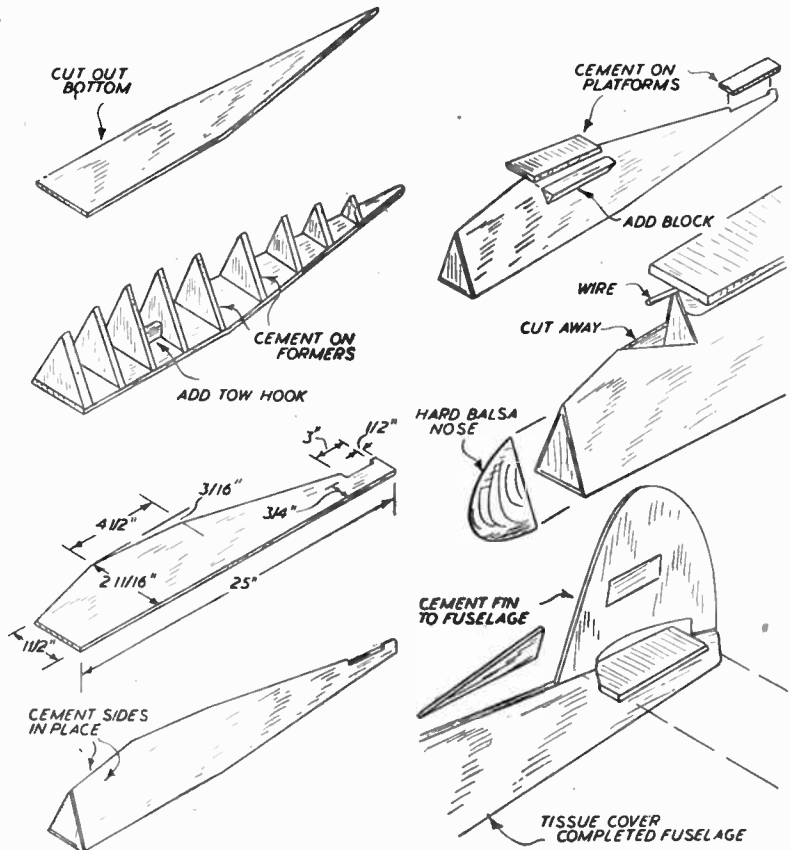
The wings and tailplane are held in place with rubber bands. When the finished model is assembled it should balance at a point 6 ins. back from the front of the fuselage. Weight must be added to the front compartment of the fuselage to achieve this, cutting a small hatch in the fuselage side to introduce the weight and then cementing it closed again when the correct amount of ballast has been found.

Launching Catapult

For sport flying, make up a launching catapult consisting of a 75ft. length of thread tied to 25ft. of $\frac{1}{8}$ in. strip rubber. Tie the free end of the rubber to a stake which is pushed into the ground, and add a simple wire ring or loop to the free end of the thread. This engages the towhook on the model.

Lay out the catapult line downwind, hook the model on to the line and walk backwards about ten paces. Release the model and it will be pulled forwards and upwards, releasing itself automatically at the top and gliding down. A small streamer of silk or similar material should be used to assist the line to disengage at the top of the climb.

Plans for this model are reproduced 1/3rd full size on page 351. Those who wish can obtain full size plans, price 3/6 post free, on application to The Editor, Hobbies Weekly, Dereham, Norfolk.



Fuselage construction step by step

For really long flights, use a 300ft. thread line and tow the model up to the full height of this line by running forwards with it into the wind. For convenience this line should be stored on a small winch or a similar fitment for winding it. Trimming the model for best

performance is achieved by adding or subtracting ballast to get a smooth glide descent. A stalling flight indicates that more nose ballast is required. If the model dives, either take some of the ballast out or pack up the trailing edge of the tailplane slightly. (426)

More Books to Read . . .

Spotlight on Science No. 1

By Dr. J. Gordon Cook

IF you are interested in science and want to keep in touch with advances in scientific fields, this booklet will help you. It is written by one of the most experienced writers on popular science, and highlights, discoveries and inventions of our back-room scientists. No technical knowledge is required to understand the book—it is written for the man in the street and his family.

Published by Merrow Publishing Co. Ltd., 23 Ganhill, Guildford, Surrey—Price 1/6.

Lino Cutting and Printing

By F. J. Christopher

THIS is another of Messrs. Foyles' popular handbooks, and maintains the high standard set by its predecessors. It is written by an expert in many aspects of craftwork, a writer who may be better known to some as the editor of Popular Handicrafts. Although printing

is not one of the oldest crafts, it is one of the most interesting. Lino cutting, of course, is allied to printing, and as a fascinating and absorbing pastime there is much to recommend it. Tools and materials are not costly, the work is light and pleasant, and it is a craft for hand workers of all ages.

Published by W. & G. Foyle Ltd., 119-125 Charing Cross Road, London, W.C.2—Price 2/6.

A Course in Plastics for Schools

By L. Feather

HERE is a book which will be welcomed by the many who take an interest in the comparatively new hobby of working in plastics. It is clearly written, well illustrated, both in line and half-tone, and is packed with up-to-date and pleasing designs for a variety of small articles which would find a place in any home. It is a book which is concerned primarily with plastics as a medium for

craftwork in schools and Youth Clubs, but the home worker need not avoid it on this account.

Published by Blackie & Son, 16-18 William IV Street, Charing Cross, London, W.C.2—Price 2/6.

Tiddlers and Tadpoles

By S. Francis Blackwell

THE second in the Medallion Collectors' Series, this is an interesting publication which will tell those people who like to collect pond life all they need to know about pond hunting, water plants and all those creatures with which the ponds are teeming. It tells, for instance, how to feed a tadpole and grow a frog, how to get the tiddler to build a nest and present you with young, and how to get a miniature underwater garden with all sorts of fascinating creatures and growing plants. It is admirably illustrated by A. Fraser Brunner in line and colour, and, although primarily designed for young folk, it contains much of interest to their elders. Published by Medallion Press Ltd., 5 Dowgate Hill, London, E.C.4.

A game for the shorter evenings— A SHOVE HA'PENNY BOARD

A BOARD for this old but still popular game is illustrated, and will provide much interest and amusement. Shove ha'penny is a game of skill, one which all can play, from the young to the old. It is now played with brass discs in place of the original halfpennies, but the latter can, of course, be still used, but must not be defaced by rubbing smooth on a stone, an old trick of yore.

Hardwood Needed

A plan of the board and side view are given in Fig. 1. For the board, a hardwood like mahogany or beech is the best for wear, with a thickness of about 1in. This takes a high polish with use

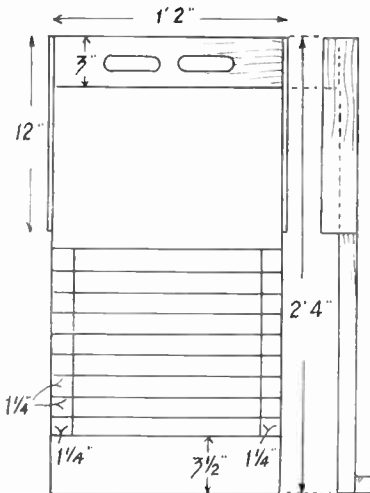


Fig. 1—Plan and side views

and lasts for years, with the added advantage of not easily splintering. In the absence of a hardwood, a good quality of deal can be employed, which can give quite good service when used only by the family.

Owing to the width, two boards may be required, glued together. If tongued and grooved boards are available, all the better. Such boards need to be batted at top and bottom, to prevent warping. In the board illustrated, one batten, 1in. square section, is fixed underneath the fore edge, where it acts also as a stop against the table, preventing the board shifting as the discs are propelled by a blow of the hand. The second batten is fixed to the upper surface of the board, right at the top, and has two cavities in which the chalks for scoring, and the discs, can be lodged safely, when not in use.

This latter batten is shown enlarged at (A) in Fig. 2. Cut it from similar thickness wood to the board, run a centre line down, and at the middle make a small hole with a brad-

awl. Then mark off, right and left, of the centre, as shown, and there bore 1 1/2ins. holes right through. Each pair of holes has the waste between sawn out, to leave the elongated cavities already mentioned. The battens should now be screwed into place, from underneath, and the screws should be well countersunk to prevent their heads scratching the table. Before screwing right home, apply a coating of glue to the battens. This should fix them securely to the board.

The scoring divisions can now be marked. Pencil lines for these are drawn across the board, all of which are the 1 1/2ins. apart indicated. Cutting across these lines at the sides of the board, are more pencil lines, making vertical rows of 1 1/2ins. squares, in which the scores are marked. These lines are

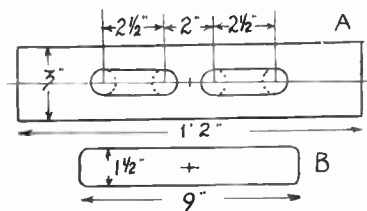


Fig. 2—The top batten and the side battens

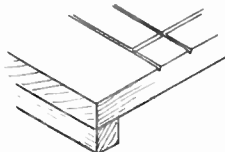
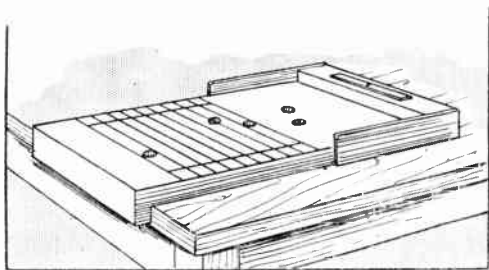


Fig. 3—How the lines are cut in the board

now cut in with a broad chisel, as in detail Fig. 3. Do this job as neatly as possible. The cut lines should not be more than 1/8in. wide and deep, but be straight and clearly defined. In the more expensive shop made boards, 'lifts' of stout brass are fitted here, but for family play such a refinement is not really necessary.

Trim up the side edges of the board, then cut two pieces of fretwood 12ins. long, and as wide as the combined thicknesses of the board and batten (A). These are glued and nailed to the edges of the board, at the upper portion, as in Fig. 1, and prevent the discs or halfpennies from jumping off the board, if struck too hard. Finally, to complete the work of construction, cut a strip of fretwood to pattern (B) in Fig. 2. Round off the side edges of it, and fix it over the top batten, with a round-headed brass nail through its centre. Here it acts as a cover to the cavities for chalk and discs,



and can be swung round, as desired, to allow access to those accessories, when play is about to start.

Well glasspaper the board to satin smoothness. A rub over with french polish will also help to improve the surface, and allow the discs to slide easily over the board. In the absence of the halfpennies, brass discs, 1in. diameter can be substituted; these can generally be bought from any sport's shop. Though not essential, it is a good plan to stain the scoring squares dead black to show up the chalk marks more plainly.

Probably readers know how to play, but to those who may be ignorant of the rules, each player strikes the 5 discs in turn, and endeavours to get them in the horizontal divisions. With each success a mark in chalk is made in the scoring square opposite, one player using, say, the right side, and the other the left.

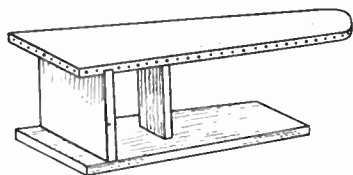
When a division has 3 such marks it is closed, and if the player does get another disc in it, it counts as a point to his opponent. The winner is he who gets all his divisions full up first, naturally, and there is some skill, not only in getting a disc fairly in a division, but also in using the discs to drive one out of a division where it may not be wanted, and in gently urging a disc, which may, unfortunately, lie partly on a line, to settle itself inside it safely, by a gentle tap with another disc.

Watching this game being played, it is really amusing, and rather astonishing also, to see how gently a hefty fellow, with a hand like the proverbial leg of mutton, can propel a disc up the board. (420)

HOBBIES 1952 HANDBOOK

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A present for mother—a USEFUL SLEEVE BOARD



THE young handyman will rank high in mother's estimation if he buckles to and makes one of these useful sleeve boards to help her with the ironing. The work entailed is not hard, and no great difficulty should be encountered if you carefully follow the instructions.

Its Function

For those of you who may be somewhat in the dark as to the true function of the sleeve board, illustrated at Fig. 1, let me explain that it is, as its name implies, a board so shaped that it may be comfortably inserted into the sleeve of a dress or jacket, and is raised from its base so that the remainder of the garment is kept well out of the way while the sleeves are being ironed.

The sleeve board may be made from yellow deal or any other odd scraps of timber that you have available. The base measures 2ft. long by 7ins. wide, the top member measures 2ft. 3ins. long by 7ins. wide, and the upright supports measure 5½ins. long by 7ins. wide and 6¼ins. long by 3ins. wide respectively. Timber ¾in. in thickness may be used throughout.

Having planed and squared up the four pieces of wood, start work on the top member. First mark out a groove to receive the largest upright. It should be 1in. from the wide end of the board and with the aid of a tenon saw and a sharp

chisel should be cut ¼in. deep. Next mark out a mortise 1½ins. long to receive the narrow upright. The mortise should be 8ins. from the wide end of the board (see Fig. 2) and may be made by first removing as much waste as possible with brace and bit and then finishing off with a sharp chisel. The top member may be tapered and neatly rounded at the narrow end, as illustrated in Fig. 2.

The positions for the groove and mortise on the base can then be marked and cut out in a similar manner to that described above. The base, of course, is not tapered.

Final Job

With the top member and base completed, your final job of construction

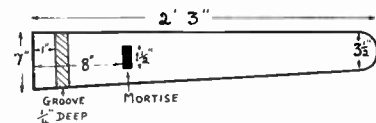


Fig. 1

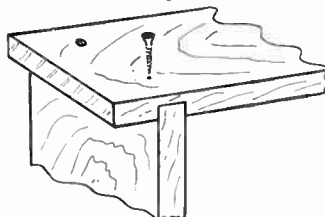


Fig. 3

consists of forming a tenon on each end of the narrow upright (see Fig. 3). Cut these tenons carefully to ensure a good strong joint when they are fitted to the mortises.

Your sleeve board can now be as-

sembled. When satisfied with their fit, the joints may be glued together, the widest support being reinforced by 1½ins. countersunk wood screws as shown at Fig. 4.

In order that Mother may have a smooth surface along which to run her iron, the top of the sleeve board should be covered with a piece of old blanket or similar material. To do this, place the sleeve board upside down on a suitably-sized piece of material, and with sharp scissors cut the cover to shape, making it 1in. wider than the sleeve board all round.

Fix the cover temporarily into position with three or four drawing-pins, ensure that the material is quite smooth, and then go round the edges of the board systematically with tacks placed about

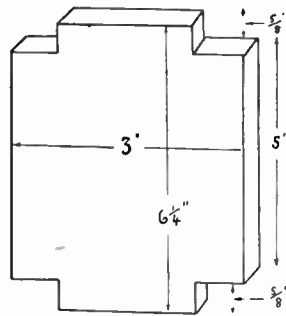


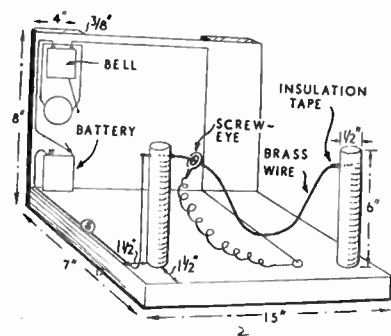
Fig. 2

1½ to 2ins. apart. If you wish to make a really professional-looking job of the sleeve board, the blanket may be covered with a piece of old sheeting or pillow-slip, etc. Cut this to shape and pin it temporarily into position in the manner already described, and finish off by tacking strong linen tape all the way round the edges. (333)

Make this Simple Nerve Tester

HOW steady are your nerves? Arrange tests with your pals and see who can traverse the whole length of the wire of the tester described here without causing the bell to ring once.

The constructional details are simple. Fix a plywood or hardboard back 8ins. high to a base measuring 15ins. by 7ins. by 1in. If desired, this back can be strengthened by two pieces of wood ¾in. thick and 4ins. wide as shown. In the base drill two holes, ½in. in diameter, 1½ins. from the front edge and from the sides and into these fit 6ins. lengths of ¼in. dowel rod, which have been pierced at the upper end to carry the ends of a length of brass wire as shown. This



brass wire passes through a screw eye to which has been fastened (soldered, if possible) a length of flexible wire about

20ins. long. About ¼in. at either end of the brass wire is wrapped with insulating tape on which the screw eye can rest.

Connect one end of the brass wire to a switch, flashlamp battery and electric bell as shown. The other terminal of the electric bell is connected to the flexible lead attached to the screw eye.

With the switch in the 'on' position, try to pass the screw eye along the length of the brass wire without it touching the wire. As soon as it does the bell will ring, since the circuit is then completed. When carrying out the 'test' the elbow should not be resting on any support.

Do not forget to switch off when putting the nerve-tester away. (360)

Proper balance is the secret of A HIGH-FLYING KITE

SIMPLE to make, this robust kite is scapable of flying out a gale and will reach considerable altitudes in normal winds. The secret of success lies largely in producing a properly balanced kite, as will be described.

The Frame

Frame construction is simple. Two 4ft. lengths of 1in. by $\frac{3}{16}$ in. birch are

outlined of strong kite string or similar twine is glued in place.

The Cross Member

The cross member must then be bowed with a straining cord attached from tip to tip—Fig. 2. The required 'bow' is exactly 5ins. under each tip and it is important to get the curvature exactly similar on each side. For this reason the cross member should be

when supported at each end of the central member. If one side is heavier than the other, add weight to the lighter side until it does balance truly. The kite must also balance longitudinally at a point exactly 17ins. from the front. Again add weight to the nose or tail, as necessary, to achieve this. When the kite is properly balanced the bridge can be attached.

The main line is tied to the point

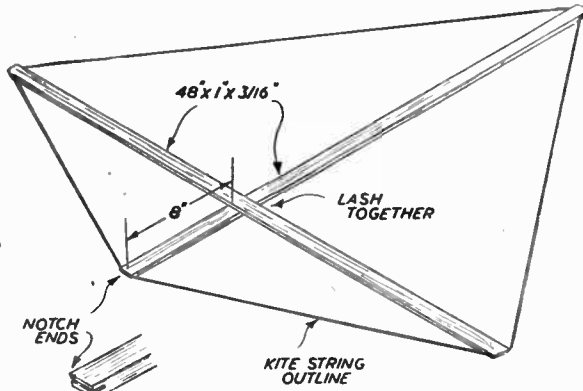


Fig. 1—The first stage in making the frame

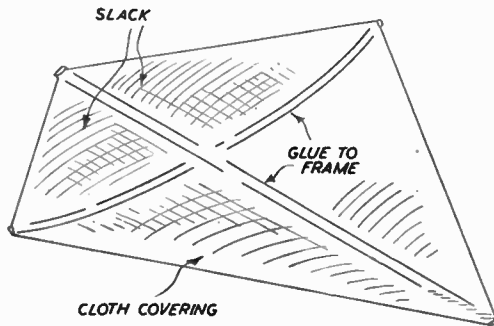


Fig. 3—Covering the frame

lashed together in the form of a cross, as shown in Fig. 1. The cross member must come exactly 8ins. from the front of the central member. The ends of the two spars are notched, as shown, and an

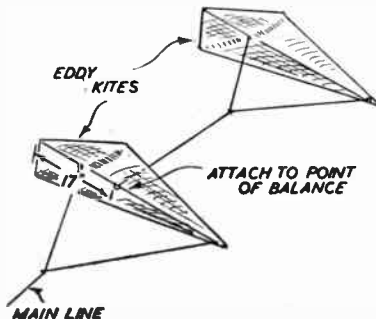


Fig. 5—Flying two kites in train

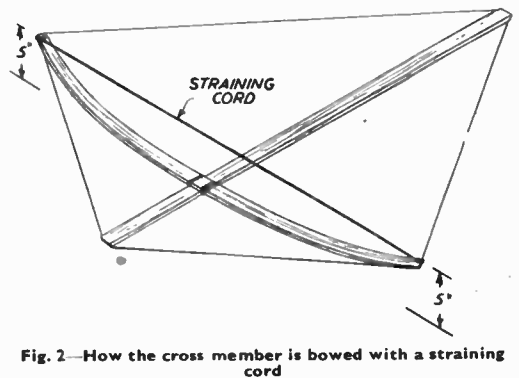


Fig. 2—How the cross member is bowed with a straining cord

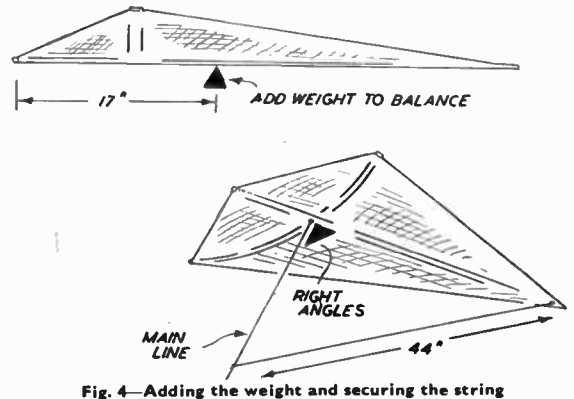


Fig. 4—Adding the weight and securing the string

chosen from good straight grained stock.

Covering

The covering is then attached to this frame with cord outline. Light cloth can be used, or, better still, parachute nylon. This latter material is generally excellent, and fairly readily obtainable. The whole kite can be covered in one piece, gluing the material to the frame members and making off and sewing around the outline with a suitable hem. Each of the four resulting kite panels should be slack and it is important that there should be the same amount of slack in each of the corresponding side panels. If one is tighter than the other it will develop different 'lift' and upset the flying balance. It is worthwhile to spend a fair amount of time on getting the covering exactly right.

It is then necessary to balance the completed kite. It should balance level

where the two frame members cross (i.e. 8ins. from the front of the central member). Since the kite flies with the covering on the underside, this line must pass through a small hole in the covering. To the tail of the kite then tie a 44ins. length of kite string. The free end of this string attaches to the main line at a point where it will hold the main line exactly at right angles to the kite, as shown in Fig. 4.

Flying in Train

Two or more kites of this type can be flown in a train, as shown in Fig. 5, all off a single line. The second kite is tied to the point of balance of the first kite on a short line, and so on. Remember, however, that in a train of kites the pull on the main line is increased and so a stronger line must be used. (424)

With gudgeon, bleak and ruffe you get LOTS OF PLEASANT FISHING

DURING their free time many junior readers spend happy hours by the stream, with fishing-rod and line. A lot of fun may be enjoyed in this way, trying to catch such fish as the gudgeon, bleak and ruffe. All these smaller river fish swim in big shoals, and therefore if you are lucky or wise enough to locate them, you may keep catching fish after fish without moving from that particular 'swim'.

For these fish you do not require an expensive outfit. A 10ft. cane rod with reel and 20 yds. of line will do nicely. To the line you fasten a nylon or similar gut substitute cast 1 yd. long with a No. 14 hook. Do not have too thick a cast, but choose 3x or 4x. This mark indicating the thickness is plainly marked on the packet or envelope. You will want a few split shot and a float—the latter a small goose quill or similar.

You nip sufficient shot on to the cast about 9ins. above the hook to weight the tackle so that only the tip of the float shows above the surface of the water when you are fishing. The number of shot required depends upon the kind of water you are fishing in—if swift and deep a larger float and plenty of shot are needed; if a quiet, slow, medium water—as a canal or placid stream one shot only will do.

All these items of tackle can be obtained from the fishing tackle shops or from stores such as Woolworth's.

Gudgeon

The Gudgeon is a smallish fish, grey-brown in colour, mottled green and spotted. It has two little wattles or barbs hanging from its mouth, and resembles the barbel on a miniature scale. Though small, it is plucky, and on very fine tackle and tiny hook provides good fun when hooked. Gudgeon are not so easily scared as many of the bigger fishes. We have caught them almost at our feet when wading in a shallow stretch of water on the river Trent. When you get among a shoal all feeding eagerly, the fun is lively enough.

Gudgeon feed on insect larvae, freshwater shrimps, crustaceans, worms, caddis grubs, etc. You can get three-pennyworth of maggots from the tackle dealer and these will do well for bait, or you can dig up some small worms, if there is a garden or an old manure heap available.

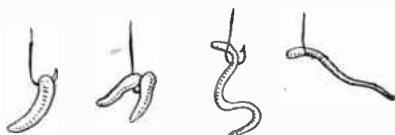
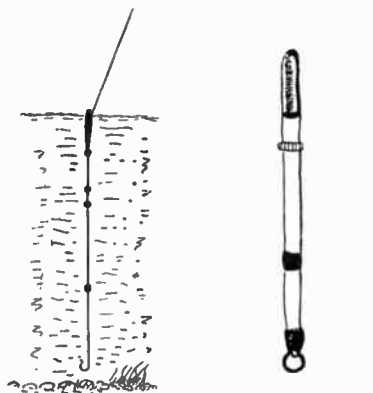
Gudgeon are what we call gregarious—that is, they love the company of their kind and swim about in big shoals or schools; thus, if you start catching them you can keep on fishing at that spot and expect to go on catching them. But even these little fish that keep close to the bed of the river where pebbles gleam in the clear water, can be 'finicky' at times. Meaning that they are not desperately hungry just then and so do not care

whether they take the bait or not.

However, gudgeon will 'bite' when other fish, as roach, are decidedly 'off the feed'. Frequently, they figure in the keep-nets of match-fishermen by the dozen, and have helped many an expert to win a prize; indeed, there are occasions, on some rivers, as the Trent, when anglers in competitions would fare poorly without these little gudgeon.

The biggest gudgeon recorded for English waters was a fish of about 3½ozs. A gudgeon 5ins. to 6ins. long can be accounted a good fish.

On some rivers 'raking' is a method used when gudgeon fishing. This is simple. You merely take with you a



Drawings showing float tackle with slotted cast and hook, a goose quill float, and differently baited hooks

long-handled rake of the common garden variety and use it on the bed of the stream just above the spot where you intend to fish; this raking colours the water and also disturbs all manner of foodstuffs from the bottom. The titbits float down with the discoloured water, bringing the greedy little fish 'on the feed'. You throw your hook, baited with a scrap of worm or a maggot, into the cloudy patch of water, and it will be very surprising if you do not get a fish almost every minute, for a short time at least. When a place has been well tried, move upstream and rake up another patch.

Sometimes a gudgeon-fisher hooks a large perch or a hefty chub—if you do, then look out for thrills!

Sometimes it is helpful if you throw into the 'swim' you intend to fish, a few handfuls of ground bait. This can be simply made of soaked bread well 'mashed' and then rolled into small balls or scattered in loose. If a few small worm scraps are mixed in it, all the better.

Bleak

Here is another delicate little river fish of silvery appearance, very active in warm, sunny weather. You may see this fish swimming just beneath the surface on hot days in summer, darting up at insects and other titbits that float downstream. The same rod and tackle as used for other small fish will do, and the lighter in weight the rod the more fun you will get when a bleak is hooked.

Bleak are generally found in clear rivers and brooks with a fairly fast current—they don't like stagnant waters. They like to frolic about in a brisk stream. Izaak Walton called the bleak the 'river-swallow', on account of its darting movements.

Bleak will take either gentles (maggots) small red worms, or caddis grubs. They are very pretty fish, and give pleasure to the angler. They run small in size, the record specimen for English waters being a fish of 5½ozs., caught in the river Trent at Radcliffe, near Nottingham. At one time, the scales of bleak were used for making artificial 'mother-of-pearl' jewellery.

The Ruffe

The ruffe, or poose as it is also named, has been referred to as the 'poor relation' of the perch. Indeed, the ruffe may be said to be a smaller representative of the perch—a less warlike and humbler relative. For the young angler starting his apprenticeship, the ruffe affords much diversion, as it bites greedily, is easily hooked, and makes up in quantity what it lacks in size. Get among a shoal and you will agree that they are 'greedy' and voracious. Like gudgeon, ruffe are gregarious and where one is found there are others. It is possible to catch as many as fifty and more at a standing by baiting with small red worms.

Although resembling the perch, the ruffe has little of the former fish's brilliant colouring. It is of sober hue, being dark-grey or brownish-olive mottled with darker blotches, and brassy tints showing along his flanks. There are blackish dots on the dorsal fin and tail. He has just the same hog-back shape as the perch, but the ruffe has only one spinous fin; the perch has two, one spinous, the other soft. (419)

PREVENTING SCRATCHES

When an article is put in a vice for finishing off, it is often damaged by the jaws of the vice. To avoid damaging a good piece of work, hold a piece of rubber on each side of the jaw before closing, and this will prevent any further damage. Two pieces of rubber cut from an old cycle inner tube will do the job well.

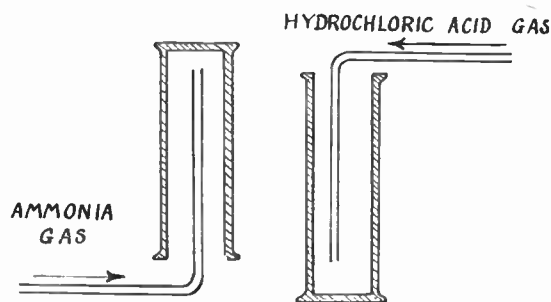
Experiments with Ammonia in HOME CHEMISTRY

THOUGH ammonia comes into scullery and laboratory as a liquid, it is actually the gas ammonia dissolved in water and is more correctly called ammonium hydroxide. It is made either from one of the products of coal distillation or synthetically by extracting the nitrogen from the atmosphere and causing this to unite with hydrogen.

There are many industries in which it is used, among them being the textile industry. A simple experiment will show one of its textile uses—an experiment which will solve an often present

upward displacement (Fig. 1). As it is lighter than air, there is no danger of it falling out of the gas jar! To find out when the jar is full, hold a piece of wet red litmus paper at the down-turned mouth of the jar. Now close the jar with a greased glass plate and set it aside, still mouth down.

Collect a similar jar full of hydrochloric acid gas by warming a little of the strong acid. As this gas is heavier than air, collect it by downward displacement (Fig. 1), and test at the jar mouth with wet blue litmus to ascertain when it is full.



UPWARD

DOWNWARD

Fig. 1

dyeing problem for the lady of the house, too.

Home dyers know that a coloured wool garment cannot be dyed a lighter shade. This can, however, be done by first stripping off the existing colour with hot soap solution and ammonia.

Take one part of soap (it is immaterial whether by weight or volume), dissolve it in one hundred parts of hot water, add three parts of ammonia, drop in a piece of dyed woollen cloth and bring to the boil.

Keep the wool on the move with a glass rod or stick, so that it is evenly stripped. As the boiling progresses, the colour will be removed from the wool and eventually leave it in its natural cream coloured state.

Dark Colours

For dark colours it is usually necessary to add more ammonia during the boiling. After stripping, the wool should be washed in several changes of hot water. It can then be dyed any desired colour. Using this method the writer converted a lady's bottle green beret into a scarlet one.

Ammonia solution readily parts with its dissolved ammonia gas when it is warmed. By making use of this property we can prepare sal ammoniac (ammonium chloride) in a rather spectacular way.

Warm a little ammonia solution in a small flask and collect a gas jar full by

Now lift up the ammonia jar and place it on the hydrochloric acid gas jar, so that the mouths are together with the glass plate between them. Now invert the jars, quickly remove the plate and bring the two jar rims together.

With a slight puffing noise the apparently empty jars will suddenly be filled with a thick white smoke! The 'smoke' is sal ammoniac. After a while this will settle on the walls of the jar, and

the mixture, the weather may be forecast as follows:—

- Powder almost filling tube—southerly winds and rain.
- Crystals almost filling tube—northerly winds and fine weather.
- Crystals caked on one side of tube—wind from that quarter.
- Leafy crystals moving about at top—gales.
- Clear at top, crystals at bottom—fine weather.
- Mixture very white looking, with starry crystals moving about—hoar frost or snow.
- Crystals moving slowly upward—rain.
- Chemical weather glasses work fairly well, but are not always accurate.

Curious Property

Ammonia has the curious property of combining with metallic salts to form complex substances called amines. One of these is nickel hexamine sulphate. It is prepared by passing ammonia gas over anhydrous nickel sulphate.

First prepare the anhydrous nickel sulphate by heating a few crystals of ordinary green nickel sulphate in a crucible until the substance is yellow.

Place this in a dry horizontal glass tube, as shown in Fig. 2. Generate ammonia gas by warming a little ammonia solution in the flask and pass the

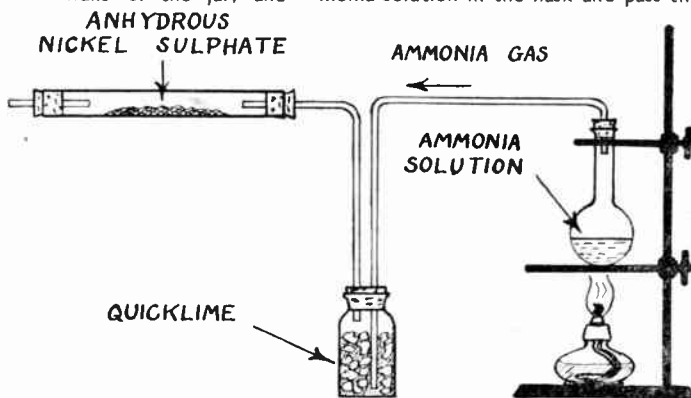


Fig. 2

may then be scraped off and added to your chemical stock.

Sal ammoniac is one of the ingredients of the chemical weather glass. The recipe for a chemical weather glass is:—

Sal ammoniac ...	38 grains.
Potassium nitrate ...	38 grains.
Camphor ...	2½ drachms.
Water ...	9 drachms.
Methylated spirit ...	11 drachms.

Put the mixture into a glass tube and shake thoroughly. Cork it and pierce a small hole in the cork to serve as a vent. The weather glass works best if placed in the open air, so that it is exposed to all four winds.

From the appearance of the solids in

gas through a small bottle containing lump quicklime to dry it before it passes over the nickel sulphate.

As soon as the gas comes in contact with the nickel sulphate, the latter begins to increase in bulk and soon changes from yellow to a pale violet colour. If you feel the tube you will find it has become hot from the energy of the reaction.

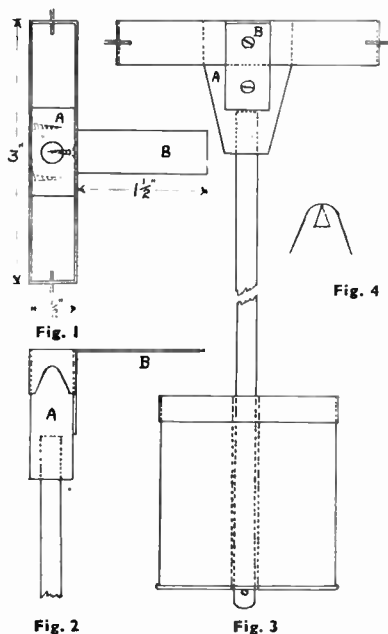
When the yellow colour has entirely gone, the reaction is complete and you may now transfer the nickel hexamine sulphate to a tightly corked tube for your chemical stock.

(Continued foot of page 347)

A gadget for photographers—an AUTOMATIC DISH ROCKER

THE necessity of keeping solutions in the developing dish in constant motion cannot be over emphasized. It does not matter what process is being carried out, only the best results can be expected by following this advice.

Many gadgets have been invented from time to time to help make this job easier. By using an automatic device to keep the dish rocking for a period, the operator has his hands free to carry out other operations, thus saving much valuable time.



Valuable Gadget

The handy little gadget described here has been tested out over a period of many years and proved a valuable asset to the dark room equipment.

The time taken and the small cost to make it will be amply repaid in a very short while. The apparatus consists of a pendulum pivoted so that it swings very easily, and this movement works a 'lifting lever' on the bench top.

In order to keep a pendulum swinging for some considerable time, two things are necessary—the method of suspension must be as free from friction as possible, and the pendulum bob must be quite heavy. It is also an advantage to make the pendulum rod as long as possible.

Pendulum First

The top view Fig. 1 and side views Figs. 2 and 3 clearly show in detail the method of making the gadget. Commence by making the pendulum rod, which is of $\frac{1}{8}$ in. diameter dowel rod firmly glued into the block marked (A). Cut this block of hardwood $1\frac{1}{2}$ ins. long, 1 in. wide and $\frac{1}{2}$ in. thick, and taper off as shown in Fig. 3. Drill the hole about $\frac{1}{8}$ in. deep and make it a tight fit, and, besides gluing, it can be fixed with a fine panel pin as it will have to bear a considerable weight.

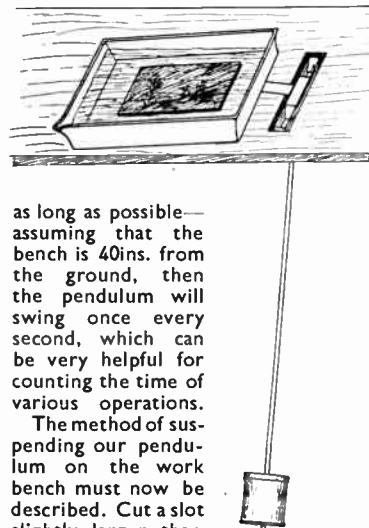
Around block (A) is fixed a $\frac{1}{2}$ in. wide band of sheet brass in the shape of a long rectangle 3 ins. long and $\frac{1}{2}$ in. wide. A strip of 16 gauge, 7 ins. long, is bent up as shown in Fig. 1, and the ends soldered together.

Before fixing it on to the block (A) the ends must be cut to form the bearings. When considerable weight has to be carried, the best method for this purpose is, undoubtedly, the knife edge fulcrum as employed on scales. Fig. 4 shows this in detail.

Drill a hole about $\frac{3}{16}$ in. diameter in the centre of each end, and then cut as shown in Fig. 2, leaving a nice smooth curve for the knife edge to work on. The piece can now be screwed on to block (A), at the same time fixing on strip (B). This is just a right angle piece of brass 2 $\frac{1}{2}$ ins. long, $\frac{1}{2}$ in. wide and of 16 gauge thickness. The top portion is about $1\frac{1}{2}$ ins. long as shown in Figs. 1 and 2.

The pendulum bob is made from an old tin which can be filled up by pouring molten lead in. It should be made so that the rod can be slid off, and to do this the tin lid and bottom is drilled to take a length of metal tube. This is fixed in position when the lead is poured in.

The bob is kept on the rod by drilling a small hole near the end and inserting a piece of wire. The pendulum should be



as long as possible—assuming that the bench is 40 ins. from the ground, then the pendulum will swing once every second, which can be very helpful for counting the time of various operations.

The method of suspending our pendulum on the work bench must now be described. Cut a slot slightly larger than the 3 ins. by $\frac{1}{2}$ in. rectangle shown in Fig. 1—make it about $\frac{1}{8}$ in. longer and $\frac{1}{8}$ in. wider. The two knife edges for pivots can be made of a piece of knitting needle filed to the shape shown in Fig. 4 after the temper has been drawn by heating in a flame.

Drill a hole in each end of the slot in the bench and tap the pivots in securely. The exact positions for the holes can be measured by placing the pendulum in the slot with its top just level with the bench top.

A slight recess can be cut so that the brass strip (B) lies flat on the bench top if desired. The pendulum is placed in position on the knife edge pivots by first removing the bob, lowering the rod through the slot and then replacing the bob.

When at rest, the brass strip (B) is bent up slightly, so that the pendulum can swing equally in each direction. The amount of bend will determine the distance that the dish will be rocked up and down.

With a sufficiently weighted bob and a knife edge nicely pivoted, the pendulum will swing long enough for any operation to be carried out. The dish can be laid right over the lifting lever, or it may only make contact near one edge. (390)

Home Chemistry—(Continued from page 346)

After you have removed the nickel sulphate reaction tube, we can use the ammonia flask and quicklime bottle for the preparation of an unusual salt of ammonia. This is ammonium carbamate.

Fix a wide delivery tube to the quicklime bottle and dip the open end into methylated spirit contained in a small beaker. Stand the beaker in cold water. Generate carbon dioxide (from marble

chips and dilute hydrochloric acid), dry it by passing it through a calcium chloride tube and lead it through a wide delivery tube into the methylated spirit.

If you now warm the ammonia solution, ammonia gas will also bubble through the methylated spirit. In a short time fine white crystals will begin to separate out in the methylated

spirit, due to the ammonia and carbon dioxide combining.

These crystals are ammonium carbamate. When the spirit is pretty well filled with crystals, disconnect the apparatus. Filter off the ammonium carbamate and dry them at room temperature on a clean porous tile or brick. (409)

Replies for Radio Enthusiasts

Measuring Mains

I HAVE a five valve, three wave-length wireless which can be regulated to suit the voltage of the mains, which in this case is 245 volts. When the wireless is set to take this voltage, a rather soft tone is experienced, and it loses a great deal of range. However, when it is set to 220 volts, the range is greatly widened and the reception of the Light and Home Programmes is boosted. I would be grateful if you could throw some light on this problem, for although a better reception is obtained when it is set to take a lower voltage, I have been informed that this will, in time, burn out the transformer. However, if it is set at 245 volts, I am confined to a limited number of stations, and wonder whether I can eliminate this factor. (H.A.—Stratford).

MOST receivers of the type you mention, have an arrangement whereby the turns-ratio of the mains transformer can be adjusted, by selecting tapings, for voltages between about 210 and 250. When you employ the 220v. taping, the transformer is delivering more voltage to the set than when you use the 245v. taping, and this accounts for the increased volume and range. It is

suggested that you measure the actual mains voltage with a reliable meter, or have this done, and set your receiver for this. Many mains supplies are not much above 200v. and may drop a good deal below this during 'power cuts'. It does not seem very likely that your mains are above 220v., in which case, you could use the 220v. transformer tapping permanently, but it would be wise to have this measured, as suggested. If your mains are 245v., this is very unusual, and a lower tapping certainly seems to be required. By adjusting your set to a voltage higher than that actually delivered by the mains, you are losing volume and range.

A 'Buzzing' Radio

I HAVE rather an old set and have noticed a buzzing noise which is a great interference. I have traced this buzzing to a transformer which is fixed direct to the chassis. This transformer is continually buzzing and is affecting whatever comes through the speaker. Can you give me a remedy? (G.A.B.—Fulham).

IT is assumed the set is mains-operated, and if the component indicated has only two leads, it is probably the

smoothing choke. Here, a defect such as shorted turns would be likely to cause mains-hum. If the component is becoming unduly hot, this could be caused by the break-down of one of the associated mains smoothing condensers, which should be replaced at once or other damage may be caused. Examination of the condensers will probably show discolouration if the component is at fault, or a test with a meter will reveal this. Breakdown of insulation in the choke, or loose laminations, might also be responsible for the trouble, and tests or examinations will reveal whether this is so.

L.T. Eliminator

IN a 1947 issue of *Hobbies Weekly* there is a diagram of an H.T. eliminator; at the end of the article it says that in a later edition, a way of adding L.T. would be explained. Will you send me details of the L.T. adaption? (R.W.—Honor Oak).

OUR issue, dated October 20th, 1948 contained details of a Low Tension mains unit for use with an accumulator. If L.T. supplies are to be obtained without retaining one of the accumulators previously used to operate the set, very exact adjustment is necessary to ensure that the output is exactly 2 volts, and such adjustments will depend upon the current consumption of the individual receiver. It is, therefore, best to retain one of the accumulators, to avoid this complication.

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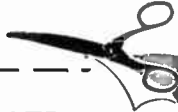


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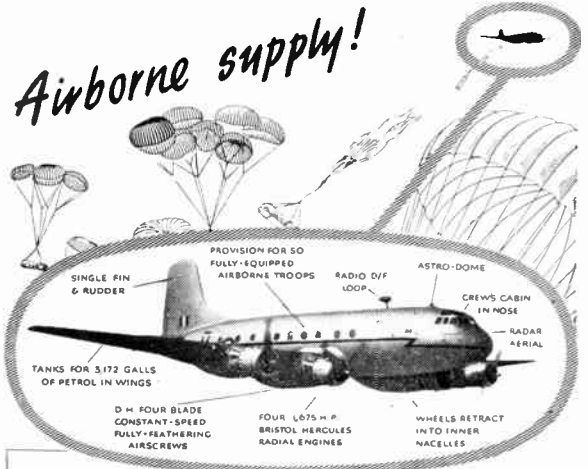
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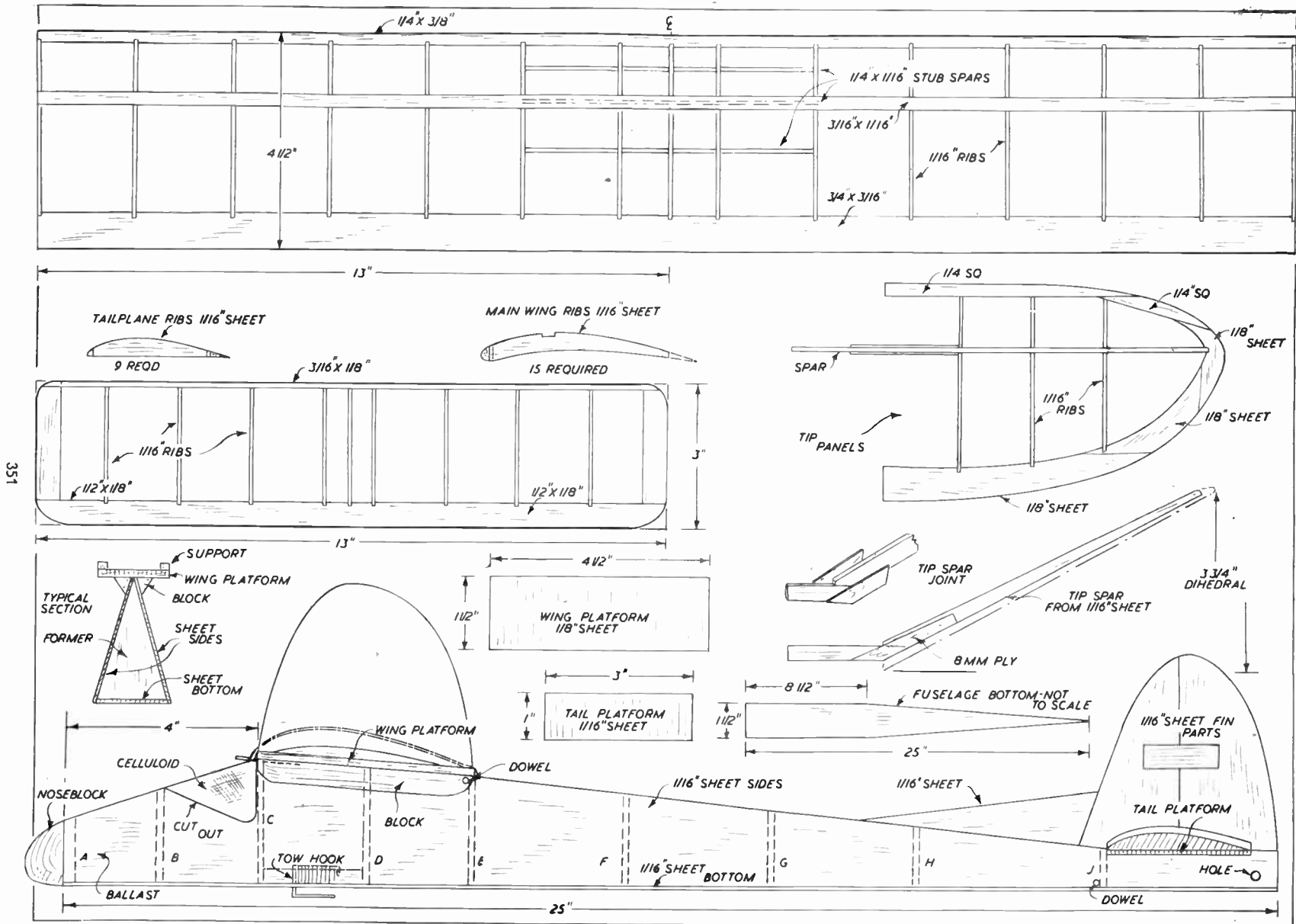
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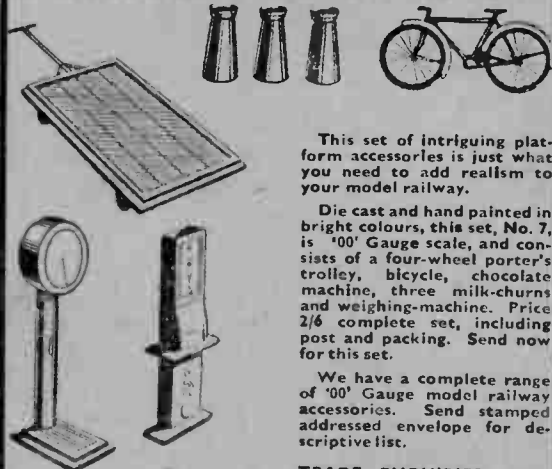
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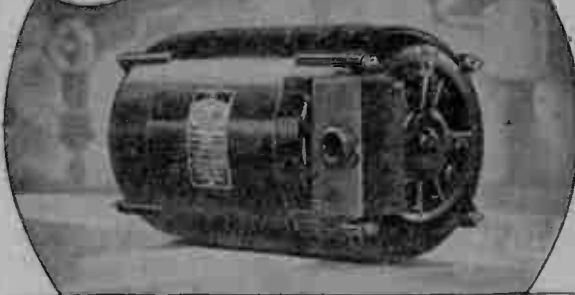
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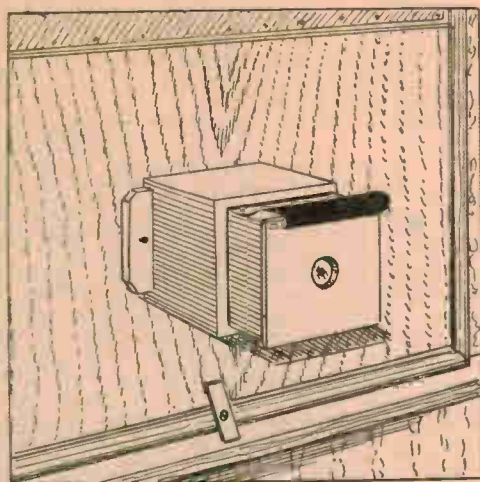
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DESIGN SHEET FOR A
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THERE is quite a lot to be said in favour of a darkroom enlarger; it is simple and inexpensive to construct; it ensures an even illumination by using daylight, needs no electric current, and enlarges to any degree within reasonable limits. Of course, a dark room is the first essential, but this is easily arranged by the use of a black-out screen to the window, and in this article the enlarger is embodied in the screen as a permanent fixture.

The Screen Frame

A frame for the screen should be made first. This is drawn in Fig. 1, and should be suitable as regards its measurements for the window, naturally. It is made from deal, $\frac{1}{2}$ in. by 1 $\frac{1}{2}$ ins. stuff, except the top piece which needs to be a bit wider, say, 2 ins. A simple halved joint at the corners, as at (A) will serve, glued and nailed together. The middle bar can be just nailed across, as a halved joint here might tend to weaken the frame. It should be a close fit in the window frame, and can be retained in position

of course, for plate development, and such like extra sensitive work. The lower half of the frame is covered with plywood or a suitable hardboard or plywood substitute board. The latter to be preferred. If the window is rather on the large size, it will be advisable to strengthen the corners of the frame

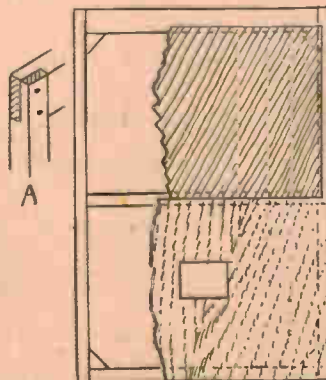


Fig. 1 The frame for the screen

Build your own

DARKROOM ENLARGER

with a metal button at top and bottom, screwed to the beading surround.

The top half of the frame is covered in with a piece of yellow fabric, to illuminate the room with a safe light, except, of course, for plate development, and such like extra sensitive work. The lower half of the frame is covered with plywood or a suitable hardboard or plywood substitute board. The latter to be preferred. If the window is rather on the large size, it will be advisable to strengthen the corners of the frame

with angle blocks, glued and nailed in, as shown in the drawing.

Red Curtain

A curtain of red material is fitted to the upper half, being tacked along the top, and let down as occasion demands, to cover the yellow fabric, and ensure a safe light for developing. A second curtain, this time of black material, is fitted over this similarly, to exclude all light when an exposure is to be made. Both are provided with a bottom hem, in which a length of round wooden rod is to be pushed through, to weight the curtains down. They are rolled up when not required, and kept up with side loops of string at the top. The general arrangement is depicted in Fig. 2, and should be quite clear.

In the lower half of the frame, an opening is sawn out, a trifle larger, not much, than the size of the negatives to be enlarged. This opening comes directly behind the enlarger, and should the window have middle sash bars, the opening should be cut in the place where no such impediment to direct light exists, naturally. The actual enlarger can now be dealt with.

This consists of a double box, one sliding within the other for focusing purposes. The arrangement is shown in Fig. 3. The sizes given will suit negatives or plates of $3\frac{1}{2}$ ins. by $2\frac{1}{2}$ ins. or smaller;

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

for larger size negatives, a proportionate increase in the measurements will be necessary, but this should not lead to difficulties. The outer box should be cut from wood (deal will do), $\frac{3}{8}$ in. thick, to ensure enough substance for securely screwing the box to the plywood on the

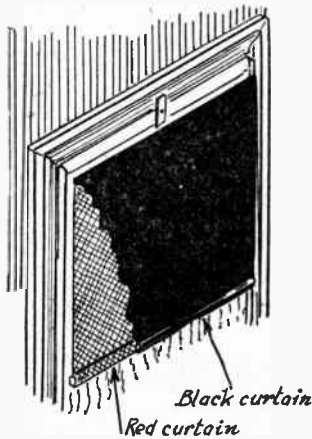


Fig. 2—The arrangement of the curtains

screen. It will be noticed that one side of the outer box is $\frac{1}{8}$ in. shorter in length than the other, this is to leave a space for the negative carrier to slide in and out. To assist in this, a slip of thin wood is glued inside the box, at top and bottom, as shown by dotted lines in the drawing, making a groove to guide the carrier.

The box can be put together with plain butted corner joints, well glued and nailed, but care should be taken to make it truly square. Inside the front opening, strips of velvet or similar material are glued round, to make a lightproof joint for the inner box, which slides for focusing. The actual dimensions of this inner box should be very carefully measured, a good plan being to cut a spare bit of wood to the measurement, and if this is right, to make the box to the same, when it should slide comfortably in and out, without tending to stick anywhere.

The front of the box is made $\frac{1}{2}$ in. larger all round, and has a hole bored through the centre just a little less than the diameter of the lens. The front is cut from $\frac{1}{2}$ in. fretwood, in fact the whole inner box could well be made from similar thickness wood. Both boxes should be well glasspapered, and the sharp outer corners of the outer box slightly rounded off. Screw the outer box over the opening already cut in the plywood panels of the screen. Now give the lot, enlarger and frame, a coat of dead black stain all over.

The lens for the enlarger should have a

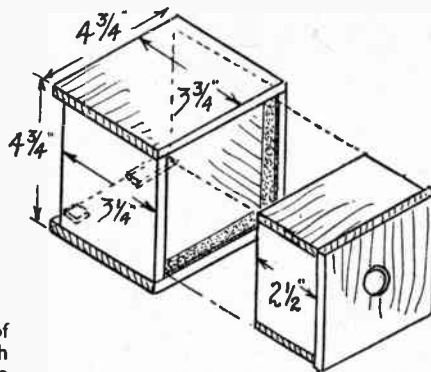


Fig. 3—Details of the actual enlarger

focal length of approximately $4\frac{1}{2}$ ins. A convenient kind as this is usually the focus of a $\frac{1}{2}$ -plate box camera lens, and there must be many of these cameras about, and there should be no great difficulty in finding one, should the reader not own one of his own. Most photographers stores could supply, or a secondhand lens could be obtained from dealers in such articles. If a lens of longer focal length is employed, the lengths of the outer and inner boxes are increased in proportion, so no difficulty should result. Fix the lens behind the front of the inner box.

A simple form of shutter can be fitted, or what will serve as well, a piece of black material, arranged to fall over the front like a small curtain, much

the same as shown in the general view. If used, a piece of metal rod, stitched in place at the bottom, will weight the curtain, when down. Of course, a fan-shaped piece of fretwood pivoted in front, to shut and open the lens aperture by merely swinging it from side to side, could be substituted here.

The negative carrier, Fig. 4, can be made from two pieces of $\frac{1}{2}$ in. fretwood, cut to the size given. The length allows the carrier to extend on one side, and a strip of wood, or even a screw, here, will provide a grip for the fingers to withdraw the carrier as necessary, either when fitting in the negative or changing it.

In one piece, cut out a panel the same size as the negative; in the other piece a

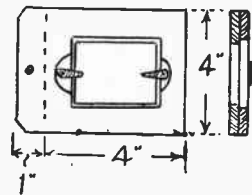


Fig. 4—The negative carrier

panel, $\frac{1}{8}$ in. smaller all round. Glue the two pieces together, to leave a rebated opening for the negative. If a film is used, then two pieces of thin glass are fitted in the opening, between which the negative can be sandwiched. To hold them in position, a pair of small metal clips are fitted, as in the drawing, and it is practically necessary here to cut recesses in the wood for these clips, to prevent them catching against the ends of the box as the carrier is withdrawn. If the screws holding the clips, however, tend to stick up too high, a small notch can be filed from the ends of the box, enough to let them pass freely.

This completes the whole contraption. A panel of plywood can be arranged at the right distance from the enlarger, to which the paper can be pinned, but such a simple matter can be left to the reader's own ingenuity safely enough. (452)

Ship of the Cinque Ports—(Continued from page 355)

lightly crumpled to give a natural appearance. If metal foil is not obtainable, good quality card can, of course, be substituted.

The yard is tapered at each end from thin dowel rod, and bound tightly to the mast just below the rope ring.

Painting

The decks, floors of castles, mast, yard, and the whole outside of the hull is stained dark oak. The inside of the bulwarks is painted red, and the outside of the castles and top can be painted red or light blue with a gold edging. Use a spirit stain (never water) and small pots of enamel for the colours. When everything is dry, finish off with a coat of eggshell varnish overall.

Next, draw out the sail on light linen, pin out on clean blotting paper, and paint in the design. When dry, machine-

stitch it at $\frac{1}{2}$ in. intervals, and hem it as narrowly as possible. A light cord should be sewn to the edge all round, allowing small loops at all corners.

Rigging

The rigging is very simple. The three shrouds aside terminate in small thimbles or bullseyes, which can be shaped from slices of dowel rod with a groove filed round the edge. Each thimble is then drawn tight to an eyebolt in the side, made from a pin with the head cut off and turned in round-nosed pliers. The forestay is similarly set up to an eye in the stem.

Bind a thimble at each end of the yard, and in each lower corner of the sail, lace the sail to the yard with a chainstitch. Rig the braces through two small holes bored through the bulwark on each quarter. The sheets, rove

through the lower sail corners, are rigged similarly. The lifts to the yard-arms can be represented by a single cord rigged as shown in the drawing.

Finishing

Solder up a small grapnel from wire and tin strip, and lash to the bulwarks. The cable leads from the grapnel ring through a small block on the bowsprit end. There are also two small blocks on the sprit which take the leads of the bowlines. These extend from the leeches (side hems) of the sail, through the blocks and down to the deck.

Glue up two ladders from tobacconist's spill, and insert between castle floors and deck below. Lastly, make a small stand from two end pieces shaped to accommodate the keel on their upper edges, and joined by a single flat strip of wood. (413)

A small model of a 13th century SHIP OF THE CINQUE PORTS

THIS small 13th century ship model is based on the Seals of the Cinque Ports, which offer virtually the only reliable information we have of this period. It is an attractive subject, particularly for a first model, as it is colourful and shapely, yet simple to construct and rig.

Space does not allow the description of a fully detailed replica, but that given, though slightly simplified, is basically accurate and representative of the subject.

The drawing should be enlarged to the full size of the desired model. To do this, lay off the hull plan in $\frac{1}{2}$ in. squares, and, on a piece of drawing paper, lay off squares which are the desired multiple; e.g. for a model twice the size of the plan use 1 in. squares; three times the size, $1\frac{1}{2}$ in. squares, and so on. Then, noting where the hull lines cut the small squares, mark off similar points on the large ones, and join up in fair curves, and the desired enlargement will result. This need be done only for the hull. Spar lengths, etc., can be obtained by simple linear multiplication.

For the keelpiece, lay the full-size plan on a sheet of $\frac{1}{2}$ in. plywood, prick

and, with a square, mark off and carry round all faces the transverse station lines. Mark these lines on the keel-piece also. Now lay the latter on one edge of the block, and, using it as a pattern, draw in the lower curve of the hull.

Next, measure up each station line from the keel-piece to the deck, and join up the points with a fair curve. This is the sheerline.

Cut the block to profile on these two lines, the sheerline by transverse saw-cuts and chiselling away the waste, and restore the centre and station lines. Mark out from the drawing the plan view of the hull, cut out, shape to section, and glasspaper as smooth as possible. The keel-piece can now be glued and pinned in position.

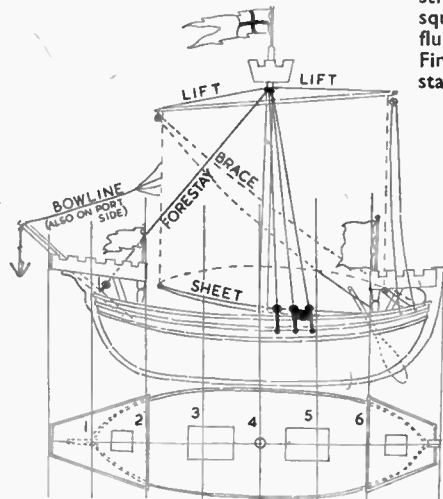
The deck is cut from ply or thin wood, but about $\frac{1}{16}$ in. narrower all round. Scribe in the planking lines about $\frac{1}{16}$ in. apart, and pin and glue deck to the hull, so that a $\frac{1}{16}$ in. rebate is formed all round.

For the bulwark, make a card pattern of the required depth and a very accurate fit in the hull rebate; cut from $\frac{1}{16}$ in. ply. Pin and glue flush in place, with small angle pieces at the ends for strength. At $\frac{1}{2}$ in. intervals, glue $\frac{1}{8}$ in. square strip to the inside, and cut off flush with the top of the bulwark. Finish with capping strip pinned to these stanchions.

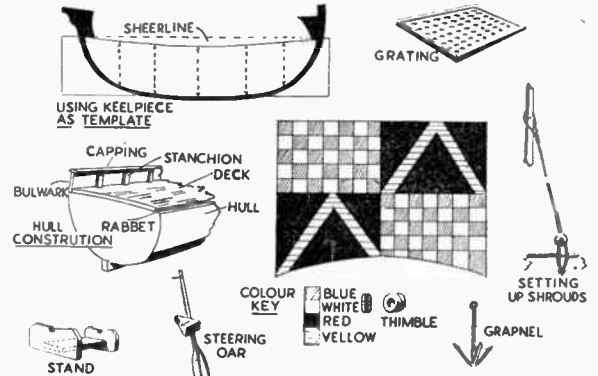


wood. Shape and thin the blade, and insert short strips at the end for a handle. Then shape and pin in place a chock on the starboard (right-hand) side just forward of the aftercastle and pin the oar to this.

The mast is cut from dowel rod, tapered towards the top and glasspapered smooth. The battlemented top can be made similarly to the endcastles, from plywood, and glued to the mast. Just below the top, glue a piece of stout



Plan, side and end views of the craft



Details to help the modeller

through* with a divider point the inner and outer lines of keel, stem and sternposts. Then join up the points, cut out with a fretsaw, and glasspaper clean and smooth.

The Hull

To make the hull, select a piece of deal or pine as clean and knot-free as possible, of the required length and breadth. Its thickness should equal the measurement between the hull bottom and a line drawn between the ends at deck level. Draw a centre line all round,

Fore and Aftercastles

Floors and battlemented sides are of $\frac{1}{16}$ in. ply, glued together, and each floor has an oblong hole cut for access. Glue to the tops of the stem and sternposts, and support the inner corners on $\frac{1}{8}$ in. square strip, shaped and moulded with file and glasspaper.

There are three wales on each side of the craft, the top one covering the joint between the hull and bulwark. Cut them from $\frac{1}{2}$ in. by $\frac{1}{16}$ in. strip and pin in place.

The steering oar is cut from $\frac{1}{2}$ in.

cord round the mast, to support the shrouds. The bowsprit is also from dowel. Drill a hole in the floor of the forecastle on the right-hand side of the stem, and glue the sprit through this hole into the deck.

For the hatches, plain rectangles of thin wood can be used, but, more correctly, they can be pierced with rows of square holes to represent gratings.

Flags should be cut from thin copper or brass foil, spot-soldered to long pins, and painted. When dry, they can be

(Continued foot of page 354)

Here are some practical ARTICLES MADE BY NETTING

YOU will have learnt in a previous article how the actual knots and mesh are made in netting, so this time I am giving you instructions for making various useful articles by this craft.

RABBIT NETS

For these you will require a ball of the green or brown string which is sold at many country ironmongers for this purpose, two brass rings about $1\frac{1}{2}$ ins. in diameter for each net, and, if the net is to

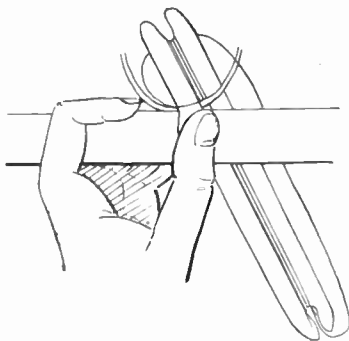


Fig. 1

be a purse net, some thicker string of a type which will not twist when wet. Use a 1 in. mesh stick and corresponding shuttle.

Start by casting twenty-six stitches directly on to one of the rings in the following manner; thread the ring on the stirrup loop and hang over a convenient knob. The ring takes the place of the foundation loop described in the previous article. Load the shuttle and tie the end of the string to the ring. Hold the mesh stick just under the ring, bring the shuttle down in front of it, then under and up between the ring and the top of the stick. Draw tight and hold string with left thumb. * Make a loop to the left in the usual way, bring the shuttle through the ring from the back and through the loop just made (see Fig. 1). Pull up tight. Repeat once from *.

You have now cast one stitch on to the mesh stick, but made two knots on the ring. Continue in this manner until you have twenty-six stitches on the stick, with an extra knot between each stitch on the ring. Net on these twenty-six stitches until fourteen diamonds have been completed. Cast off by holding the second ring in place of the mesh stick and knotting directly on to it until all the loops have been taken up. Note that when casting off there is no need to make the additional knots on the ring between each stitch.

If a purse net is required, take two pieces of the coarser string about 9 ins. longer than the net and tie them on to one of the rings and at each side of the knots. Thread down the edges of the

net and through the second ring, knotting the two ends together.

SHOPPING BAG

This can be made all in one colour, or in stripes, and a $\frac{1}{2}$ in. mesh stick and shuttle are used throughout. The handles should be about 4 ins. in diameter and made of plastic, wood, etc. (an old pair of slave bangles would do well), or can be made of string knotted as follows; take 2 yds. by 4 yds. lengths of string and an odd piece about $\frac{1}{2}$ yd. long. Make a stirrup loop as in netting, fold each of the three lengths of string in half and knot them on to the stirrup by placing the doubled end behind it and bringing the cut ends up and through the loop and pulling tight on to the stirrup, see Fig. 2. The short length must be between the two long ones.

Note that, while knotting, each pair of strings is worked as one unit. Now take the left hand string (A) and pass it over the centre core (B), and behind the right hand string (C). Then pass (C)

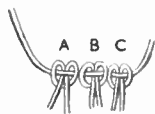


Fig. 2

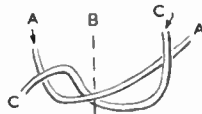


Fig. 3

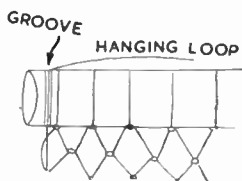


Fig. 4

behind (A) and (B) and forwards through the loop formed between (B) and (A) (see Fig. 3). Pull tightly horizontally. Next take (A) again, remembering that it is now on the right hand side, and repeat the movements but in the reverse direction. This completes one knot, which when pulled tight will lie quite flat. Continue until 11 ins. has been worked. Then cut off the centre core, and, using one strand from each of the side strings, make two more complete knots. Tie the ends off securely and cut off short. Make into a ring, sewing the ends neatly together. Knot a second handle exactly like it.

You are now ready to start on the bag. Tie one of the handles to the stirrup loop and cast on twenty-four stitches, making an extra knot on the handle between each stitch as when making the rabbit net. At the end of each of the first four rows of netting increase one stitch by netting twice into the last loop. If you are making a striped bag, change colours on the next and each succeeding fourth row, and continue

netting without further increase until eighteen diamonds (nine stripes) have been completed.

Decrease at the end of the next four rows by netting the last two loops together, and cast off on to the other handle, using it in place of the mesh stick, and making the extra knot between each stitch, so that the handles match exactly. Finish the bag by sewing the sides together as far up as the two top stripes.

HAMMOCK FOR DRYING WOOLLIES

These are very useful for drying any knitted garments which should be kept flat. Use a 1 in. mesh stick and shuttle and medium thick smooth white string. Cast on twenty stitches on to a foundation loop and net until about sixteen diamonds have been made. Draw out mesh stick, then cut the foundation loop, pull it out and unpick the knots, leaving a row of loops.

Take two pieces of stick, about $\frac{3}{4}$ in. in diameter and 14 ins. long, and make a small groove at each end. Thread the sticks through the loops at each end of the netting, then thread some string along each side and tie firmly round the grooves. These prevent the sides of the hammock from sagging, as well as keeping the stitches from slipping off the sticks. Make a loop of string each end for hanging purposes, and the hammock is complete (Fig. 4).

COT NET

These are made diamond shaped, and as cots vary in design and size it is impossible to give a standard measurement, but the net should be made to reach the length of the cot and down as far as the springs at each end. You will need some strong white string, four brass rings $1\frac{1}{2}$ ins. in diameter, and a 1 in. mesh stick and shuttle. Start by casting six stitches on to one of the rings. Continue netting, increasing one stitch at the end of each row, until the net (with the ring level with the springs) reaches halfway across the cot.

Then start decreasing one stitch at the end of each row and continue until six stitches remain. Cast off on to another ring, and attach the two remaining ones to the other two corners. Knot some strong tape securely on to each ring, allowing enough to tie under the cot if there is no suitable bar on the framework of the cot to which to fasten it. (449)

BOOK RACK

For making the Book Rack from this week's free Design (No. 2916) the necessary materials are obtainable from Hobbies Ltd., Dereham, Norfolk, price 9/9, including purchase tax, and post free.

Comprehensive details for making a PAIR OF BEDSIDE CABINETS

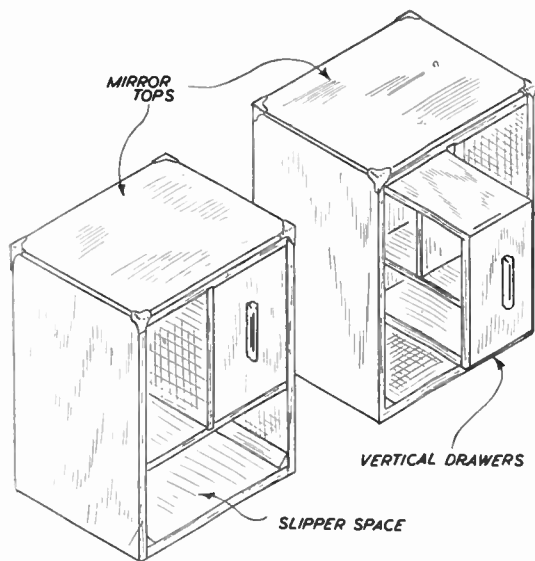


Fig. 1

THE appearance of these cabinets is considerably enhanced by the mirror tops used, giving the article a most 'expensive' appearance. The sides and front are finished by

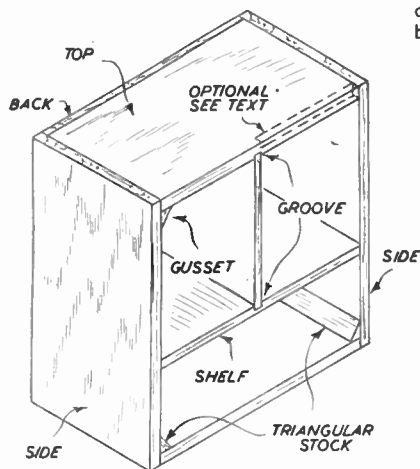


Fig. 3

staining and polishing in the normal way.

Another unusual feature is the vertical aspect of the drawer, giving clear access to the interior from bed level, i.e. whilst lying down. The cabinets are 'handed' in this respect, each drawer being on the inside (bed side) of the cabinet and opening to face inwards.

As far as the construction is concerned, both cabinets and drawers are identical, with the exception of the locating of one triangular gusset block in the top corner of the 'open' compartment.

A general layout of the cabinet is shown in Fig. 2. Dimensions are proportioned to suit average needs, but can be adjusted, as required, to match different bed heights. A view of the finished cabinet is shown in Fig. 3, and of the drawer in Fig. 4.

As drawn, the drawer is a simple box assembly, but the appearance of the whole can be improved by extending the drawer front upwards and downwards by an amount equal to the thickness of the top plus the thickness of the shelf. Shelf and top are notched to a depth equivalent to the thickness of the front of the drawer, to allow flush closing.

Parts required for the cabinet are detailed in Fig. 5. Choose nicely grained

material for the sides so that a pleasing finish can be obtained. Cut all parts accurately to size.

Drawer parts are shown in Fig. 6, the front being the only 'visible' face when finished. The shelf for the drawer is optional. If this is fitted, the top or bottom compartment of the drawer can

be sub-divided with suitable vertical partitions fretted out from $\frac{1}{2}$ in. ply.

Assembly of the drawer parts is quite straightforward, as shown in Fig. 7. Pin and glue all joints and check for squareness of the whole assembly. Cabinet assembly is shown in Fig. 8, and again the same remarks apply. Note the use of triangular gusset blocks in the cabinet assembly to strengthen the joints. Make sure that the top is finally finished quite flat.

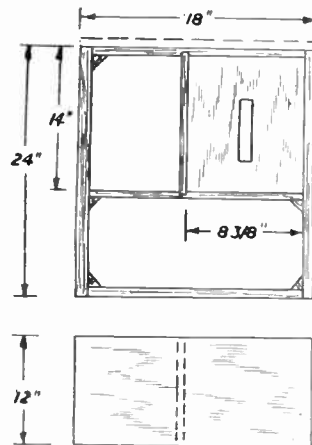


Fig. 2

The shelf rests on triangular gussets at each end, these being pinned or screwed and glued to the sides. The shelf and the underside of the top is grooved to take the partition, which is then glued in place. This separates the top into two compartments—one for the drawer and the other open. Check that the drawer is a nice sliding fit.

The final assembly consists of mounting the mirror tops, using small metal brackets at each corner. The mirror used should be cut to the exact size of

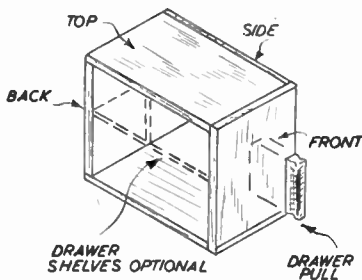


Fig. 4

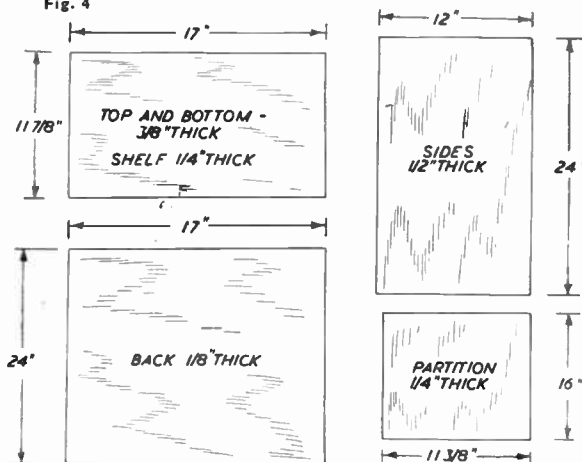


Fig. 5

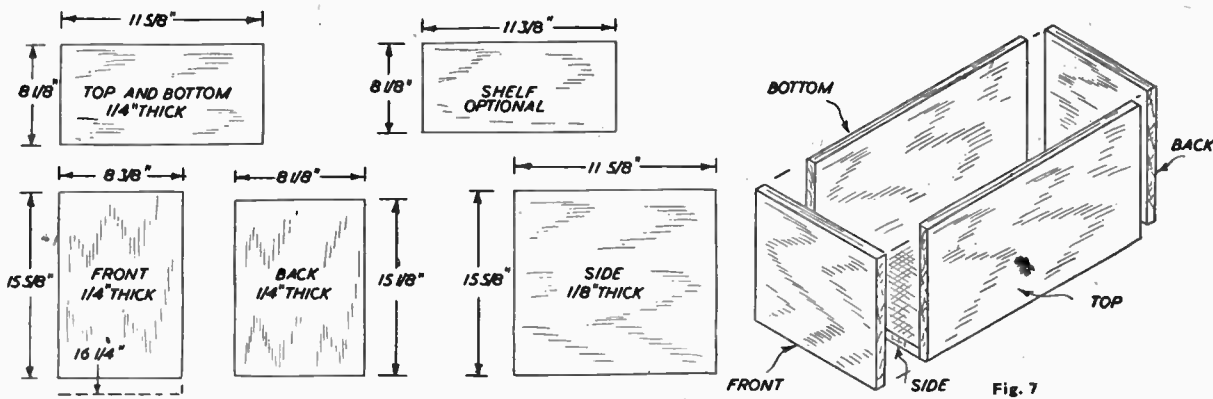


Fig. 6

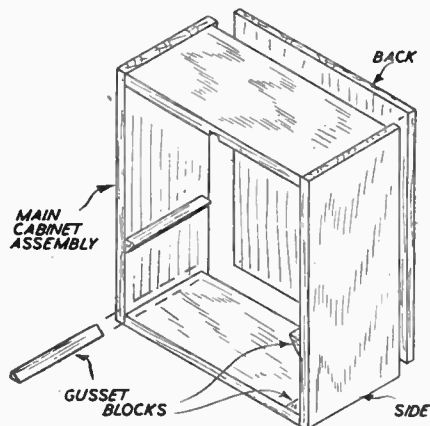


Fig. 8

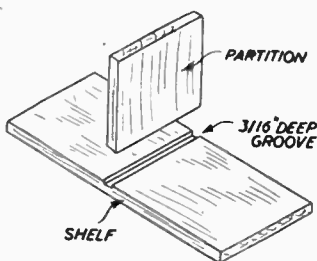


Fig. 9

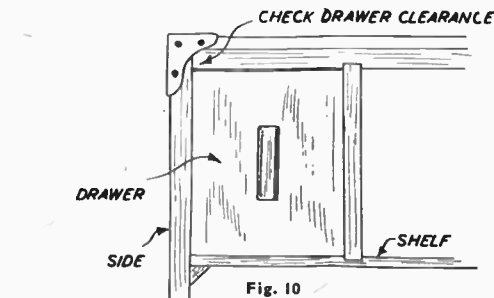


Fig. 10

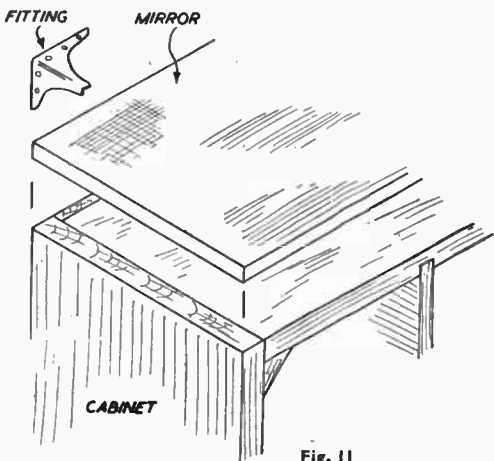


Fig. 11

Fig. 7

the top—Fig. 10. Check that the corner fittings allow clearance for the drawer—Fig. 11. If not, file the metal away.

Less Expensive

Instead of mirror tops, a less expensive cabinet can be made with either a glass top, or plain wood top, polished and stained. In the former case, the top of the cabinet itself could be covered with wallpaper, matching the wallpaper of the bedroom. This treatment is most effective. Where a wood finish is desired, cover the entire top either with thin ply or veneer and treat in the normal way. (423)

Don't keep a good thing too much to yourself—Tell your friends about Hobbies Weekly!

For model clubs—all about RUNNING AN EXHIBITION

TO keep a flourishing model club, one must have at least one exhibition every two years. At these functions you will meet parents and they will see the great interest and industry behind your pet hobby. Do not rush in madly with the idea of staging this without careful thought. Play for safety, and plan one year ahead. Watch your local paper and try to make a list of all the various functions. I consider that September is a good time. People have then tired of the outdoor fêtes and are looking to the nights ahead.

Small Advertisements

When you have decided on your date, insert a small advertisement in the local paper. Head it to 'All Local Secretaries' and you will save much ill feeling and gain the confidence of many other concerns. Attendances, all over the country are dropping sadly, due to less interest, less careful planning and bad publicity. At the same time, if you are not too confident and it is your first attempt, suggest going in with one of the larger bodies such as the British Legion or Women's Institute.

If you hire a Hall, go into the letting

agreement carefully. You will then be conversant with all the rules and set regulations. Perhaps you may not connect up electric motors or other gear without the consent of the licensing body.

You must have trestle tables. If these are not supplied then, perhaps, in return for some help at their shows, the local horticultural society will lend you some. I like these, as they are mostly 3ft. wide and 10ft. long—useful for railway layouts. But don't stick nails in them or damage them in any way.

Locally, one must be careful not to
(Continued foot of page 359)

Don't forget to switch on—make a RADIO PROGRAMME REMINDER

It often happens that some special programme on the wireless is missed because you forgot to switch on. This is where the programme reminder described on this page can be so useful.

It is quite a simple piece of apparatus and consists of a clock face, round the circumference of which is a series of holes set at quarter-hour intervals.

By looking up the programmes first thing each day, and choosing those that you want to listen to, you simply put plugs in the appropriate holes to remind you when the time comes. The hands of the clock can be set to any desired time to remind you of a very special programme, or if you only want one item in the day, then it can be set for that purpose.

The plugs used can be of different colours to denote the station required, such as red for the Home Service, white for the Light Programme and black for, say, Radio Luxembourg. When not in use the plugs are housed in spare holes in the corners of the clock dial.

Hardwood of some kind is the best material to use for making the gadget, and it would be nice to match it up with the radio set. Many of the modern sets are made of walnut, but this may be rather difficult to get these days. Some good substitutes are available, however, and with a little staining, it is possible to make a very good matching job.

For the clock face, a piece of wood 7ins. square and $\frac{1}{2}$ in. thick is used. This can be made larger and more ornamental if desired, but that will be left to the reader's particular fancy.

Find the centre of the board and mark out the four circles on which the hour and quarter hour holes are drilled. The

outer circle is 3ins. from the centre, while the other three are spaced $\frac{1}{4}$ in. apart.

The next job is to set out the positions for the twelve hours. Mark the four quarters first by drawing lines through the centre and parallel with the sides, then divide each of these quarters into three equal parts. This is quite easy with the aid of a protractor—30 degrees being allowed for each division.

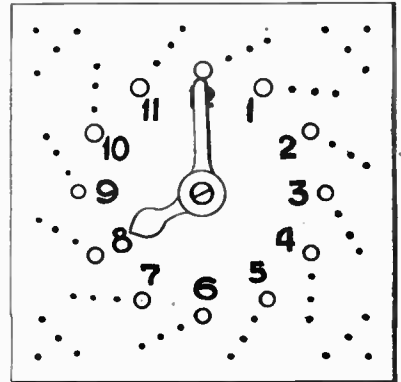
We now have each hour correctly set out and the holes for these are made on the inner circle. Each of these hourly divisions is now split up for the quarter-hour holes. By halving each division we have the positions for the half-hour holes, and by again halving them, we have the quarter-hour positions.

It will be seen from the diagram that the inner circle marks the hours, the next one is for quarter past any hour, while the half and three-quarter follow on the two outer circles respectively.

All the holes can now be drilled, and the size will depend on the type of marker that it is decided to use. The split plugs used on high tension batteries are ideal for this purpose, as well as being appropriate for a programme reminder. They are obtainable with black and red tops and if other colours are needed, they can be painted quite easily.

If the holes are made $\frac{1}{8}$ in. diameter they should be quite all right for the plugs, and they can be drilled to a depth of about $\frac{3}{8}$ in.

The figures for the hours are filled in with a contrasting paint—if the dial is made of a light wood, then black paint is best, but if it is dark in colour then white paint should be used. The painting can be made much easier by first marking the figures with a hard pencil and well pressing it into the wood. This makes a



groove into which the paint will flow quite freely.

It is a good idea to put a paint circle round the hour holes so that they stand out somewhat.

The hands are best made of sheet metal—brass, copper or aluminium are all suitable and can be cut out with either shears or a metal fretsaw. The total length of the minute hand is 2 $\frac{1}{2}$ ins. and the width $\frac{1}{8}$ in. The hour hand is 2ins. long. The centre of both hands is $\frac{3}{8}$ in. and the wide part of the hour hand is about the same.

A hole $\frac{1}{8}$ in. diameter is drilled in the centre of both hands, and a small round head screw used to fasten them to the clock face. Place a thin washer between the hour and minute hand and also one between both hands and the clock face. Screw up reasonably tight.

Suitable hangers can be fitted to the back of the face for fixing to the wall, or a strut may be attached so that it can stand on the wireless set or near by. (435)

Running an Exhibition—(Continued from page 358)

offend this party or that by some dislike of your opening speaker. This sounds petty but, unfortunately, true. Some may not like a local council member or the local M.P. Several times (and I have run nine major exhibitions in the last six years) I have chosen the Probation Officer who is, as a rule, a very good speaker and knows his subject—keeping young people off the road. Local doctors hold these same views and are, naturally, strictly non-Party.

Tables with straggling legs spoil all shows. We mostly see old boxes, string and other unsightly materials sprawled out in full gaze of the visitors. If the club can stand it, get a roll of hessian, and this need not be cut much because it can be fixed around the tables in long lengths. It will remain very good stock.

If you expect a speaker and there is a stage, then see the local florist. As a rule I have found them make a very nice show on the stage, with a little publicity. Failing this, draw the curtains on the stage or set it with scenery. The local Operatic Society may help you here.

No Scampering!

Do not find everybody scampering about for a few tools when you start setting up. Insist that each member assisting has a small tool kit of his own. Say a hammer, pliers, small saw, pincers, screwdriver, gimlet and some drawing pins, tacks, string and thin wire.

Backgrounds make an enormous difference. Most shops have quite a lot of the corrugated cardboard wrapped on parcels. This has the advantage of standing up when adjusted. It will also take distemper. Set one lad off to get enough to put behind the small scenic settings you may be having. Pale blue or green are ideal for any model of this type.

Bare walls should be covered up a bit. I get some very fine bills, gloriously coloured, from the British Railways. Bus Companies, Seaside Publicity Bureaux, and even the people who do yachting trips. Mostly, some very interesting ones can be had from the leading motor concerns. Builders of buses and commercial vehicles will also supply splendid

material. Put these up carefully and store away for another show.

Outside Help

There are many concerns who may also come in and be quite pleased to help to fill up the hall. The Royal Air Force, Navy, A.T.C. and Army have some very fine models but these are often booked twelve months ahead. The Road Safety Committee will always co-operate but to get the best material you must apply a good nine months ahead.

Many exhibitions are spoiled by rushed last-minute preparation and this cannot altogether be avoided in regard to any model show. But try to overcome the trouble by asking the Hall Committee if you can have say four hours' 'preparation' time. Stress 'preparation' and the fee may be waived or dropped as low as 2/6 per hour. Four hours at 10/- would be quite different. Arrange the terms in a businesslike way, and never wear out your welcome. Too many concerns try this, and wonder why they are refused the second time. (428)



Making a tiny TOT'S ROCKING CHAIR

THE picture shows a small rocking chair that is especially suitable for young children. The rockers are designed to prevent the child from rocking too far and over-balancing, while the cockerel's head, if brightly coloured, will appeal to any youngster.

Straightforward

The construction is quite straightforward, and you will experience no difficulty if the diagrams are carefully studied before commencing work. With the exception of the crossbars (G) and (F), which are 1in. thick, the whole thing can be made from $\frac{1}{2}$ in. stuff. Those who are fortunate enough to possess a fret-machine could also make

$5\frac{1}{2}$ ins. high. Note that the head and tail are let into the seat as shown.

These three pieces can now be assembled. Nails or screws are driven through from the underside of the seat to hold the head and tail in position. The back-rest is chamfered and similarly nailed, and is also nailed to the tail (B). A piece of $\frac{1}{2}$ in. round rod is glued in the 'eye', the length being about 4ins. or 5ins.

The Rocker

Next, the rocker part of the chair can be made up, and this consists of four pieces, two pieces (E) and one piece each (F) and (G). The method of joining together is clearly shown in Fig. 1 and the main dimensions are also given. Piece (F) is 14ins. long and measures 2ins. by 1in. while piece (G) is made

should be rounded off wherever possible. To help you in drawing out, we have shown a scale drawing in Fig. 4. Mark off the scale on a piece of paper or thin card, and measure the parts on the drawing. The dimensions are then transferred full-size to the wood.

Painting

The colour is largely a matter of personal choice, but we suggest that you use bright colours throughout. The comb of the cockerel will, naturally, be bright red and the beak yellow. The neck and tail feathers could be light brown, streaked with yellow and red to give the appearance of feathers. The rest of the seat could also be painted light brown or even a very bright colour, such as blue. The addition of a pair of reins, made from a leather thong, will complete this attractive little toy. (437)

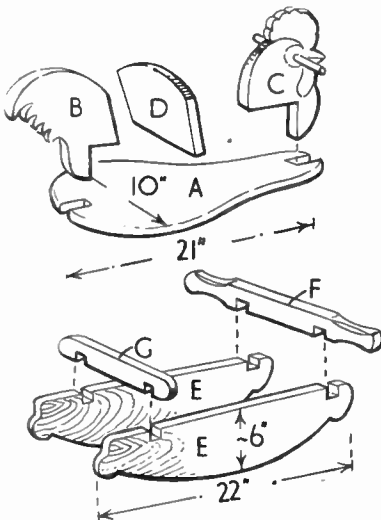


Fig. 1—Details of the various parts

pieces (B) and (C) of 1in. thick material. This would add considerably to the strength of the chair.

The parts are lettered alphabetically, and we will deal with them in that order. The seat (A), as will be seen in Fig. 1, measures 21ins. long by 10ins. wide. It can be shaped according to taste, but we suggest the approximate shape shown.

Head and Tail

Pieces (B) and (C), the tail and head, are shown squared in Figs. 2 and 3. The squares shown should be enlarged to 1in. Number the squares from left to right, and from top to bottom, to assist in drawing out the shapes. The back rest (D) will be slightly curved, and will measure approximately $8\frac{1}{2}$ ins. wide by

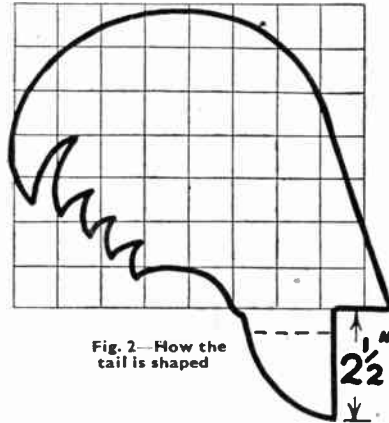


Fig. 2—How the tail is shaped

from the same material and is 10ins. long. The joints should be smeared with glue before assembling. Nail or screw the whole thing together, putting screws or nails wherever practicable.

The various parts can now be smoothed down with glasspaper, paying particular attention to the seat, which

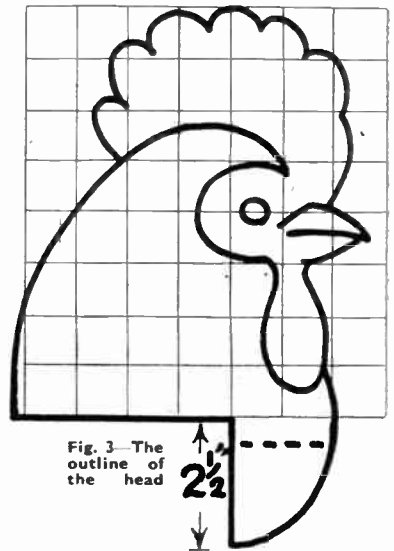
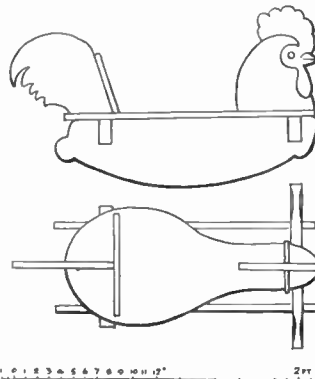


Fig. 3—The outline of the head



Plan and side views with scale to assist the constructor

A USEFUL SCRAPER

Take an old razor blade and two pieces of plywood a little larger than the razor blade. Fit the razor blade on top of one piece of wood so that the edge of the blade is over the edge of the wood. Then mark in the holes. Take off the blade, drill in the holes, and put the blade between the two pieces. Drive a small screw through each hole, and fix a small nut on the other side to complete your useful scraper.

It's easy to see in the dark with this NOVELTY BEDSIDE LIGHT

HERE is an article which should appeal to those readers who like making electrical novelties. It is a bedside light having a box container for a pocket flashlamp battery, whilst in front of it sits a cat whose eyes consist of electric bulbs—giving a somewhat startling appearance when switched on.

The light is switched on and off by a small lever attached to the top of the box behind the figure of the cat. It should be easy to tell the time by a watch laid immediately in front of the cat.

The Box

The box is easily made, as the diagram Fig. 1 shows. The base is hinged to a frame having a top fixed permanently to it. The base piece is $\frac{1}{4}$ in. thick, while the other parts of the box are $\frac{3}{8}$ in. thick, and with a mortise slot cut in the top for the passage of the wires leading up to the lamps. The slot should be about 1 in. long and $\frac{1}{4}$ in. wide.

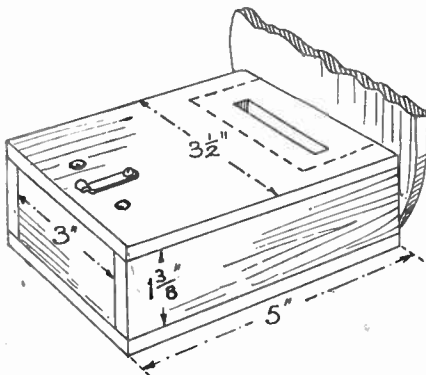


Fig. 1—Details of the box

Cut the various pieces square and glue and pin them together with fine fret pins. To hold the base securely to the box after the battery has been put in and linked up with the wiring connections, a brass hook and eye may be fitted, or two screws can be run in. These can easily be removed and replaced when a new battery is installed.

A squared diagram of the cat is given in Fig. 2, and this will enable the worker to make his enlargement direct on to the wood. On a piece of $\frac{1}{4}$ in. stuff measuring 5 ins. by 4 ins., run lines each way $\frac{1}{2}$ in. apart. Draw the outline of the animal by following each square carefully and cut round the outline with the fretsaw. Also cut the holes where the eyes come, but before cutting them, obtain the bulbs and see that they only just pass through.

At a distance of $\frac{1}{8}$ in. away from the cat upright, a second upright (A) is arranged and the threaded back portion of the bulb must be screwed into this first, as seen in the sectional diagram in

Fig. 3. A box-like casing is made of $\frac{3}{16}$ in. or $\frac{1}{4}$ in. wood to go behind the cat. In the diagram, the back of the casing is shown as (B), and the top of it as (C). The back (B) could, if desired, be held in place by roundhead screws, so that it can be easily removed in the case of any adjustments to the interior wiring, etc. A complete view of the back casing is given in Fig. 4, which also shows the two connecting wires (B) and (C), which go on to the switches below.

Carved and Painted

The cat's features could be either carved in or painted on, and afterwards varnished over. The cat outline should also be painted and varnished over. The two sides and the top of the back casing of the cat should be glued on after the cat upright has been fixed. In this way, the three pieces can be measured for convenience and neat joints made. The wiring and the battery connections are shown in the diagram

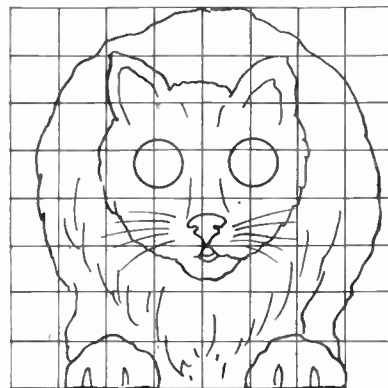
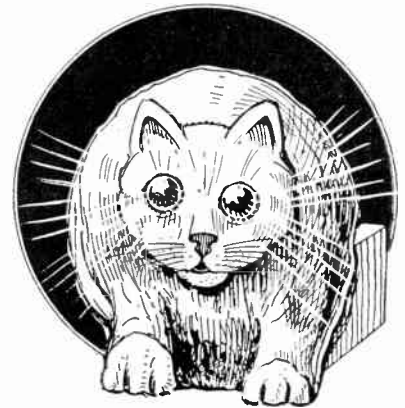


Fig. 2—The outline of the cat. Squares are $\frac{1}{2}$ in.

Fig. 5. The battery will be laid in the box so that contact will be made between positive and negative brass strips of the battery and the fittings (C) and (D) of the box. To the back of the casing and immediately between the eye holes is fixed a piece of thin brass as (A) in Fig. 5.



The bulbs screw into this and complete the contact with (C). Two smaller holes should be made in the brass strip, one to take a small roundhead brass screw for fixing the strip to the upright, the other to take the end of the wire which runs down to connection (C). The bulbs in Fig. 5 are shown ready to be screwed into (A). To make contact with the extreme ends of the bulbs, two pieces of thin brass are bent up as at (B) in Fig. 5. These are about 1 in. long and are drilled at one end to take round-headed screws for fastening.

Coiled round these screws are pieces of covered wire which should come together in the centre and then lead down to the battery below. The diagram Fig. 3 shows clearly the brass pieces and their wire connections.

Coming now to the box where the battery is installed, it will first be advisable to remove the base from the hinges so the correct positions of the contact pieces may be ascertained and marked out. Lay the battery centrally on the inside of the base and note where the two pieces of strip brass come from it.

Next, angle up two pieces of thin brass as (C) and (D) Fig. 5. Each may be cut as (D), so the battery strips can be pushed in and held tightly; or they can be

(Continued foot of page 362)

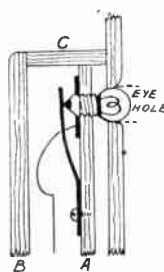


Fig. 3—How the bulbs are fitted

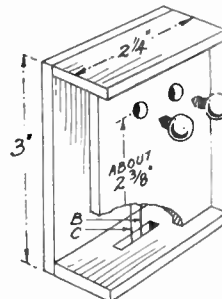


Fig. 4—The complete back casing

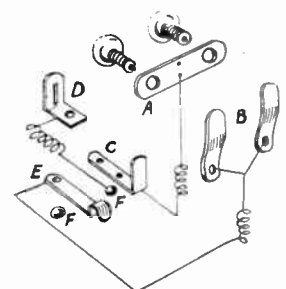


Fig. 5—Details of the wiring



REPLIES OF INTEREST



Blowing Fuses

I HAVE an American 8in. electric portable 'Mal' saw. Unfortunately it blows both '15' and '5' amp. fuses. It will start sometimes on the 15 amp. but the next time blow. Could you give me any information to get over this difficulty? (D.H.—Glastonbury).

IT is assumed that the saw is of a suitable voltage and phase for your supply, motors being made for A.C., D.C. and 3-phase working. In addition, some large equipments are not intended for use with the usual 15 amp. household supply, but require a separate power-circuit individually wired for use with them. Starting with no load would reduce the initial current surge, if this is not already being done. Once the motor has actually started, the current consumption will decrease. In some cases a starting-resistance may be used, so as to get the motor running, with no load, without any high current surge. Its value must depend upon the consumption of the motor, but, for experimental purposes, a small piece of electric-fuse spiral element could be tried. Once the motor is running, the element should be cut out by a switch in parallel. Such units are made, and referred to as 'starting relays'.

Lathe Speeds

I AM constructing a lathe and wish to have four fixed speeds to cover most kinds of wood. Could you tell me of four speeds which would suit my needs? I am using a 1/10th H.P. electric motor which turns at 1,400 R.P.M. (H.D.—Burslem).

THE most suitable lathe speed depends to a large extent upon the diameter at which turning is taking place, and with a 1/10th H.P. motor it will be difficult for you to retain a high speed, with hard woods. It is suggested you refer to one of the various large books available on wood turning, as this may guide you in relation to the work

you intend to do. For normal purposes, a speed of about 700 R.P.M. would be suitable, and would require a 2:1 reduction ratio. For small diameter work, a 1:1 ratio would be permissible, with soft woods. Large diameter hardwood turning may require a ratio as high as 4:1 unless you are taking very small cuts. Ratios of 1:1, 1:2, 1:3 and 1:4 would, therefore, prove suitable, normally, though, naturally, there is no need for exact ratios.

Electric Hair Drier

I HAVE made an electric hair drier but am having difficulty with the heater. Could you suggest a suitable gauge of wire and the amount required to supply a reasonable amount of heat? I have room for a former 3ins. long by 3/4in. square. (C.W.—Abbotsmead).

THE length and gauge of wire will depend on the wattage required, and also upon your mains voltage. Great care would be necessary to preserve proper insulation, which would not be damaged by the heat, or the drier could be dangerous to use. A wattage of about 250 would probably be suitable, but would depend upon the manner in which air is circulated. As you do not give the mains voltage or other details, it is suggested that you would find it best, and probably most economical, to purchase a ready-wound drier element from a stockist of such goods.

H.T. Unit

IS it possible to turn a wet battery radio set into an all-electric set, without altering anything, please? (L.C.—Bedhampton).

BATTERY valves are not suitable for direct operation from the mains, or from a transformer; if mains valves are used this makes new valve-holders and other circuit changes necessary. It is possible to obtain high tension and low

tension current from the mains, thus eliminating the usual batteries. A H.T. unit was described in our issue, February 21st, 1951. There would appear to be no reason why this should not be used, unless you have D.C. mains.

Alarm Clock

I HAVE a cheap alarm clock which is only 12 months old. It will not go more than eight hours, unless you lay it down on its face, then it will run the spring right out. Can you tell me what is wrong with the movement? (W.W.—Liverpool).

THIS is a fairly common complaint with many cheap drum clocks, and is mostly due to insufficient care in assembling and supervision at the factory when made. You will find that the balance pivots and cup screws are either quite dry, or very thick and dirty. Unpin the hairspring and take out the balance, thoroughly clean pivots and cups with petrol, peg out holes with a pointed match, and re-assemble, giving a spot of good machine oil to cups and all other pivots. This should cure the trouble.

Wireless Switches

I HAVE a 5-valve superhet battery set, with an on and off switch on the side of the cabinet, and a separate volume control knob on the front. This switch is rather cumbersome and seems to lose power at frequent intervals. Is it possible for me to obtain and fix a combined on-off and volume control? (A.E.D.—Rushden).

IF the switch contacts are cleaned, the set should function properly. To combine volume control and switch, obtain a new volume control of the same value in ohms as that at present used, and with a 2 or 3-point switch, according to whether two or three leads go to the present on/off switch. Fit this new component in place of the present volume control, connecting the leads just as with the old control. The leads previously going to the switch should now be moved, and lengthened, if necessary, so that they can be wired to the switch contacts on the new component.

Novelty Bedside Light—(Continued from page 361)

plain for contact only as (C). Put these two pieces on the base, and screw them in place, afterwards connecting one of them up with one of the wires from the bulbs, allowing a little spare wire for ease in handling.

To the top of the box portion fix two brass studs. These may consist of ordinary paper clips (F) and (G) in Fig. 5, just pushed through holes and turned down. The studs should be placed about 1in. apart. Centrally with the studs, and 1in. higher, screw on a lever formed from stout brass, shaped and turned up at one end as (E) Fig. 5. This is the contact lever and to its

fixing screw must be brought the other wire from the bulbs.

The Lever Switch

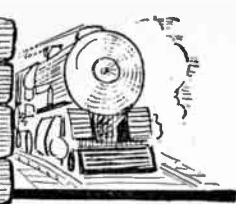
By switching the lever from the 'off' stud (F) on to the stud (G), contact is made, the circuit completed, and both bulbs lighted. To hold the battery firmly in place, two small blocks of wood may be glued on, one each side of the battery and small hooks run into the tops. Over the battery, stretch an elastic band to hold the battery steady in its place.

Those pieces of loose wire which allow for the opening and closing of the

box are coiled and laid near the battery and the top box portion replaced and screwed to the base. Two coats of clear varnish should be given to all the wood parts, including the base.

It should be noted that the size of the battery box is such that it will hold comfortably a double-cell dry battery such as is used in an ordinary cycle headlamp, or the smaller square flash-lamp battery. If the former is used, then some little modification of the contacts in the box must be made from that shown. That is, a flat contact strip will take the place of the angled piece (C) in Fig. 5.

(441)



IN the last article we dealt with the ways in which tinplate straight and curved track can be made to look real and how to get the best running from it. Here we have something to say about those most important items—points.

Tinplate points are worked by a lever which snaps from side to side, thus setting the route for one way or the other. These points are much more realistic if they are made to work from a lever frame or signal cabin some little distance away, and it is not hard to get them to do this.

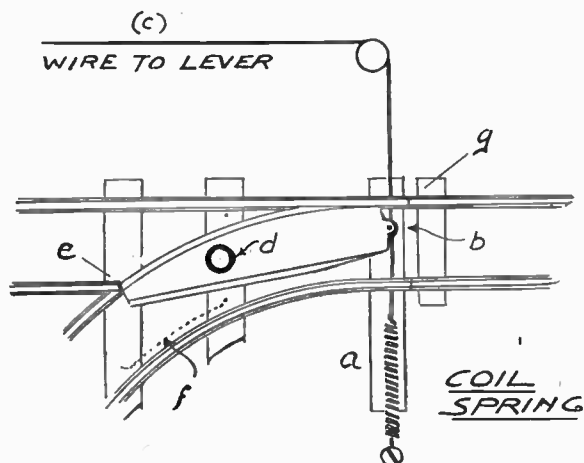


Fig. 8—Adapting tinplate points to remote control

As they come from the manufacturers the side lever with the movable blades are held in one position or the reverse by a steel spring which lies in the channel (a) see Fig. 8. By removing the underside of this channel (it is only a sort of lid, often merely pressed on) the spring can be taken away and the blades will then move quite loosely—and looser still if the short piece of wire that is connected to the loop (b) is taken off.

Remote Control

To operate tinplate points by a remote control they should be permanently screwed down or at least be on a base of their own. Having released the blade, now obtain a short coil spring (they can be obtained from most tool shops) and attach one end to the loop (b), either by drawing out a length of the spring or with an extra piece of wire, the other being pulled out and fastened to the base with a screw.

The tension of the spring should be such that it holds the blades tightly in one position. It does not matter at

which side the spring is set and the arranging depends on the position of the lever frame or box as the wire (c) should travel to it by the shortest and simplest route.

The Action

Having got the coil spring in position, now attach the wire (c)—also to the loop (b). The action of the points is that if enough pressure is put on (c) the blades will move over, thus setting the tracks for the other route, and during this action the spring is stretched more still. Releasing the pull on the wire, the blades are brought back to their original position by the tension that has been stored up in the coil.

Thus, working the lever one way sets the switch for one route, and letting it go automatically sets it for the other. Fitting the wire to the lever, which can be a simple strip of wood pivoted vertically in a frame, needs a little adjustment as the wire must be pulled just enough to move the blades over. It will be found that a good amount of variation in this can be secured by moving the wire up and down the lever—the higher it goes the greater the length of pull.

A further adjusting idea is to put a stiff length of rubber, as, say, from a cycle tube, into (c), i.e. the wire is cut and the ends attached to the rubber, as shown in Fig. 9. This length of elastic material, it will be found, takes up any difference between the lever pull and the blade movement. The rubber, however, must be fairly strong, or the point blades will sit too loosely against the fixed rail.

Electric Control of Clockwork Railways

By Ernest F. Carter

SINCE the beginning of model railways the owners of clockwork-powered layouts have considered themselves lacking the facilities of centralised control so freely offered to those who use electricity as a motive power. It is not possible, of course, to rewind a run-down clockwork locomotive by remote control, but this book will show you how to

The writer can assure readers that this method of remote control for tinplate points works really well, and he had it operating for many years with complete satisfaction on his own line. It is all a matter of careful adjustment.

There should, of course, be complete freedom of movement in the blades and examination must be made to see that the eyelet pivot (d) is not binding at all. If it is, loosen up and a bit of oil also helps on the leading sleeper where the front end of the moving section slides.

Ballast

All the hints in the previous article about improving the look of tinplate track applies also to points, but in this case ballast can only be taken up on the outside of the rails, that on the inside having to be at a lower level so as not to interfere with the action of the blades. Good pegging in of other rails at both sides of tinplate switches is very im-



Fig. 9

portant, as this is the last place in your track where you want wheels given a jolt. This is particularly so at the lead-in joint (g), which comes practically up to the point where the thin ends of the blades press against the fixed rails.

To ensure good running over tinplate switches, see to it that the rails meet in true alignment at (e). If this part ever goes badly wrong and does not seem curable by slight bending, then a check-rail can be soldered with advantage at (f). This is merely a short bit of discarded rail which has its ends turned out slightly, and it has the effect of keeping the wheels from pressing too heavily on the joint (e). And finally, for the very best running, always put in the largest radii points that the space at your command will allow. (383)

perform 75 per cent of the practical train control features enjoyed by electric railway users. Mr. Carter was ever a man of ideas, and his suggestions and diagrams throughout the book are as clever as anything he has offered us before. No owner of a clockwork railway who wishes to get more realism into it should miss getting a copy.

Published by Percival Marshall & Co. Ltd., 23 Gt. Queen Street, London, W.C.2—Price 3/-.

Here are some useful HINTS FOR FISHERMEN

FISH may be discovered and caught in many unexpected places—small brooks, drainage channels and farm ponds quite beneath the attention of many anglers. A local pond may be alive with small fish such as rudd (a fresh-water fish of the carp family), while a shallow, discoloured and narrow brook may be found to contain trout of edible size. Farmers rarely object to fishing on their land if the angler does not break through hedges, leave gates open, or take a dog, and permission can always be asked where any doubt exists.

most of their time looking up-stream to get what food the current brings down. In clear water this can be observed, but it must be remembered that if the angler can see the fish, they can very probably spot him also. So keep down, moving on the knees if possible, and avoid casting a moving shadow on the water as this would announce your arrival.

If the fish are looking up-stream, crouch a few yards below them and cast up just above them. The bait will then drift down towards the fish (see Fig. 1).

If the water is exceptionally clear,

the position of the shoal and offer the bait in the muddy water. Some bites should be obtained, and the operation can be repeated when necessary.

Feeding Times

Unfortunately fish do not seem to feed all day. Most of the so-called coarse fish like roach, rudd, perch and chub, feed in the early morning or in the evening, and it is then that the experienced—and zealous—anglers steal off to their favourite pitches. A sunny warm afternoon by a brook may be enjoyed, but it is unlikely that the catch will be anything more than small fry.

The weather is also important, and there is an old tag which offers sound advice:—

When the wind is in the West then the fishing is the best;
When the wind is in the South it blows the bait in the fish's mouth;
When the wind is in the East then the fishes bite the least;
When the wind comes from the North then the angler goes not forth.

Tackle, etc.

The set-up of tackle and the kind of

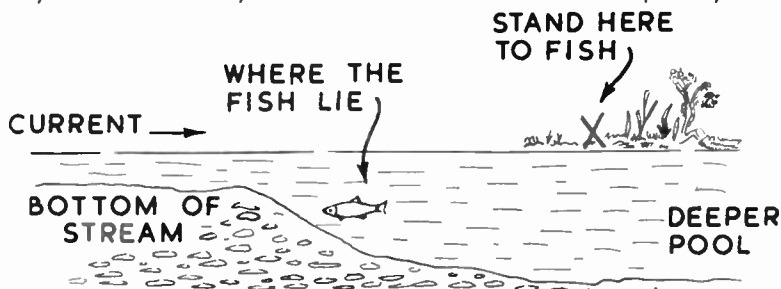


Fig. 1—Showing the set-up for catching fish facing upstream

The Average Brook

Now what about the whereabouts of fish in the average brook? Many beginners think they are bound to be far out in the middle or by the opposite bank. This is by no means certain. If you have crept up silently fish may be seen lying within 1ft. of the near bank, and if there is a hole under the roots of a tree beside the water, that may be the lair of a trout, as in Fig. 2. When a stream has a series of shallows and deepish holes the place to try is where the fast water enters the pool.

In swollen streams try sides, eddies and backwaters. In pools and pits where the water is still, do not assume that the fish will lie in the deepest part. Most fish in pools keep fairly near the bottom except on hot sunny days, when they will be seen lying lazily just below the surface for all to see. If they are doing this your chance of a catch is very small, for they are not feeding and bait will usually be completely ignored.

Fishing in Weed

To catch fish in a pool, let the bait lie just on the bottom in 4ft. or 5ft. of water and do not repeatedly draw in the line and re-cast. Let the bait lie—for half an hour if there are no bites. Some fish apparently give a thorough inspection to bait before taking it and impatience should be avoided.

Patches of weed or water-lilies are often good lies for fish, but the angler should be careful or tackle may be lost there.

In Clear Water

The fish in brooks and streams spend

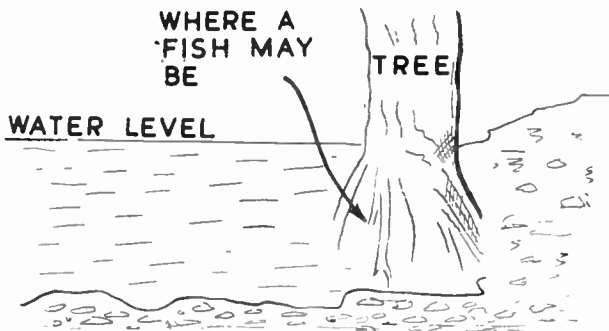


Fig. 2—A likely 'hide' for fish

additional cunning will be necessary. Reconnoitre the water and mark down a shoal of fish. Then carefully go about 10yds. up-stream, find an old branch or long stick, and stir up the mud and stones in the stream-bed, so that the water becomes cloudy. Then go back to

stuff to get has not been discussed. Fishing can be an expensive pastime, but it is possible with care and ingenuity to keep costs down to a reasonable level. It is hoped, however, that hints on the kind of gear and how to assemble it may be incorporated in a future article. (448)

ORIGINAL HOBBY

MR. WILLIAM WILLIAMS, from North Wales, is a Welshman with a highly original hobby. He is a collector, but just to be different he collects sermons. Not content with reading printed sermons of various kinds, he travels around 'collecting' fresh sermons whenever he can. Using a Bible that is specially interleaved for the purpose, he notes the text upon which the clergyman or preacher is speaking, turns it up in his interleaved Bible, notes down such data as the date,

time, church and place, and the name of the preacher, and often adds a few comments about the actual sermon itself. This 'sermon-tasting' hobby keeps Mr. Williams quite busy in what must be a rather fascinating way, and to date he has listened to over 5,000 sermons in various places of worship. Taking the average length of a church or chapel sermon, this works out at a sermon wordage of something like 15,000,000 words. Fortunately he does not take down the sermons he hears verbatim. (280)

Sodium phosphate used for SOME INTERESTING EXPERIMENTS

THERE are many phosphates of sodium, and the common laboratory reagent 'sodium phosphate' is more precisely called disodium hydrogen orthophosphate. Besides being useful to the chemist it is sometimes used by doctors as a mild purgative.

From this chemical many other interesting compounds may be prepared, a few of which we will deal with in this article.

Add ammonium hydroxide to calcium chloride solution until it has a strong smell of ammonia. Now pour in an excess of sodium phosphate solution. A white gelatinous precipitate forms. This is calcium orthophosphate.

To purify it, do not attempt the ordinary process of washing on the filter, for this is a long job. Instead, wash it by decantation several times in a big bottle and then filter and dry it in the oven. It will shrink much in drying.

If you had none of this substance in

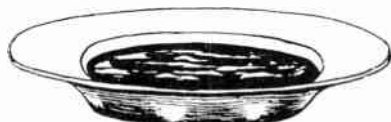


Fig. 1—Slow surface oxidation

your body you would not be able to stand up, for it constitutes the bulk of the mineral matter which stiffens the bones.

Artificial Vivianite

In Cornwall, Devonshire and Derbyshire there occurs an iron ore known as vivianite, or blue iron earth. We can prepare this mineral artificially and at the same time watch an interesting colour change.

Mix solutions of sodium phosphate and ferrous sulphate. A white precipitate of ferrous phosphate will fall. This soon begins to turn greyish, due to its absorbing oxygen from the air.

To help the oxidation pour out the precipitate into a saucer or soup plate (Fig. 1). As this offers a large surface to the air, the ferrous phosphate soon darkens to a dirty slate-blue. Stir it up occasionally. The change is complete in a couple of days and can be recognised by the precipitate not darkening further.

If you have a filter pump, you can carry out the oxidation much quicker by sucking air through the liquid, using the arrangement shown in Fig. 2.

This precipitate is ferrous-ferric phosphate and has the same composition as vivianite. To purify it, wash it well on the filter, and then dry it in the oven.

One of the most characteristic phosphates is the brilliant yellow ammonium phosphomolybdate. The reaction by which it is prepared is a good test for phosphates.

Pour some ammonium molybdate solution into a flask and then enough nitric acid to make it strongly acid to

blue litmus paper. Now add sodium phosphate solution and warm gently. A yellow colouration will appear.

Brilliant Precipitate

Set the flask aside for a few hours. Slowly there is formed a brilliant yellow crystalline precipitate of ammonium phosphomolybdate. This is easily washed on the filter. When the wash waters are no longer acid to litmus paper, you can dry the precipitate in the oven for your chemical stock.

The reaction which forms silver phosphate is a good test for orthophosphates, too, since it is yellow, whereas pyrophosphates and metaphosphates give white precipitates with silver nitrate.

To prepare it, add sodium phosphate solution to silver nitrate solution. The silver phosphate will be precipitated. If you now shake the vessel the precipitate will clog together in 'curds', in the same manner as silver chloride.

As you probably will have been able to spare only a little silver nitrate, you will not have produced enough silver phosphate to make much of a specimen when it is dried. The best way of keeping such small specimens of insoluble substances is to keep them in water in a bottle.

So wash the precipitate well by decantation and transfer it to a bottle with a jet of water from your wash bottle. When you need a small quantity of the substance, shake the bottle and pour out a few drops of the suspension.

When making use of this hint with other precipitates, always make sure the substance is not decomposed by long standing in water. The calcium orthophosphate we mentioned above, for instance, cannot be kept thus.

Double Salts

Like many other acids, phosphoric acid forms double salts. By means of sodium phosphate we can prepare one of these, namely, magnesium ammonium phosphate.

Add to a solution of sodium phosphate, ammonium chloride and magnesium sulphate. A white crystalline precipitate of magnesium ammonium phosphate slowly appears.

Allow the solution to stand a few hours so that the maximum amount is formed, then filter off the double salt and wash with water until samples of the filtrates no longer give a turbidity with silver nitrate. Dry it by opening out the filter paper and placing it on a clean porous tile or brick.

This reaction is used as a test for magnesium, and is very sensitive, provided we are patient and allow the solution to stand for a few hours.

Curiously enough, doctors often find this double salt in urinary calculi (gravel and stones). It is also found in the fertiliser guano, which consists of the

excrements of sea birds.

An interesting change takes place in cobalt phosphate when it is left in water for a day or two. Mix solutions of cobalt chloride and sodium phosphate. A splendid violet precipitate will form.

If you look closely at it, you will see it is gelatinous and bulky. Filter a little of it and note how slow is the filtration. Gelatinous precipitates are always troublesome to filter, but with cobalt phosphate we can make this easy by

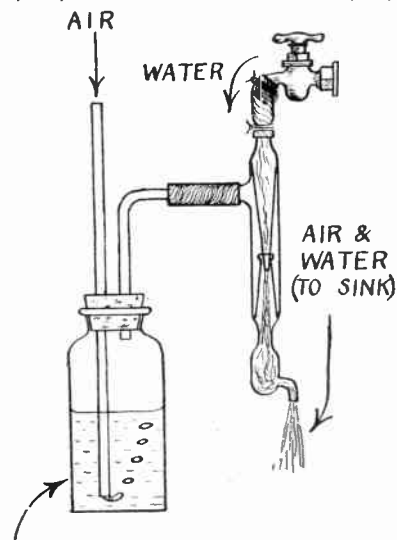


Fig. 2—Quick internal oxidation

SOLUTION TO
BE OXIDISED

availing ourselves of the fact that this substance becomes crystalline if left in the original solution.

'Seeing Things'

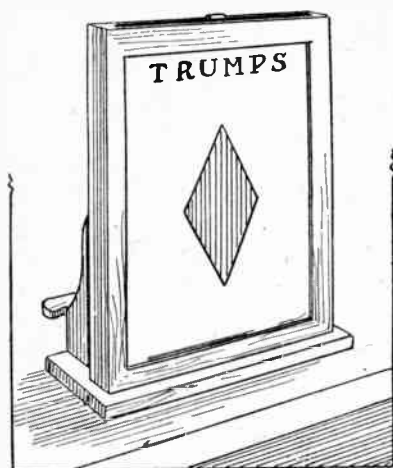
Set the solution aside. Very soon you will wonder if you are 'seeing things', for the violet precipitate will look distinctly pinker! In a few hours it will change completely to mauve pink, but will still be gelatinous and nearly fill the solution.

But in a day or so the precipitate will shrink quickly and pack down in the vessel. When it sinks no more the change is complete, the cobalt phosphate now consisting of a finely crystalline powder and which you will now easily be able to filter and wash. Dry it at room temperature by opening out the filter paper on a porous tile.

The reason for this change is that the violet form is anhydrous, but takes up water and passes into the pink hydrated form.

All these phosphates we have produced from sodium phosphate are orthophosphates. Sodium phosphate, however, can be converted quite easily into sodium pyrophosphate, and from this latter we can prepare other pyrophosphates. We will deal with these pyrophosphates in another article. (444)

Just the thing for your 'drives'—a WHIST TRUMP INDICATOR



WHIST drives seem a popular method nowadays of providing amusement, and raising funds. Those who are interested in such things, and they must be many indeed, may find the trump indicator illustrated just the thing to make. It not only shows the chosen trumps, but is also provided with a useful starting bell as well. It has not been thought necessary to make it of the folding-up type, as it could well be kept at the hall or room where the game usually takes place.

The base (Fig. 1) can be cut to shape from any suitable piece of wood available. A piece of deal would serve quite well, or even box wood, if nothing better is to hand. In the centre of the half-circle, bore a $\frac{3}{8}$ in. hole for the bell support. Where indicated, near the sides, chisel out mortises for the pair of brackets which uphold the indicator frame. The outer top edges can be bevelled off a little, or just rounded, to improve appearance.

The indicator frame is made up of two frames cut from plywood or plywood substitute, separated by slips of wood to leave a hollow space for the trump indicator cards. Make these frames to outside measurements given at (A) Fig. 2 and inside measurements of 7 ins. by 5 $\frac{1}{2}$ ins. To one, glue strips of $\frac{1}{4}$ in. by $\frac{1}{4}$ in. wood at sides and bottom, as in the diagram, then on this, glue the second frame. Cut the side brackets (B) from $\frac{1}{4}$ in. fretwood or other wood—it is not important, and saw away at the bottom ends to leave 1 in. long tenons. Glue these brackets to the base.

The frame is now screwed to the brackets and to the base. A little glue here will be helpful in securing a firm joint. Well glasspaper the whole job, and then give it a coat of stain, and finish off with one or two of varnish. It can, of course, be painted if you wish, as long as some sort of finish is applied, but whatever is done should preferably

be of a dark colour to show up the indicator cards well.

For the bell arrangement, an old cycle bell may be used. The actual bell is separated from its sounding mechanism, though the latter may come in useful afterwards, for operating it. Cut a piece of $\frac{3}{8}$ in. dowel rod, or plane up a scrap of wood to that section, and see it is just high enough, after gluing to the base, to mount the bell on it just clear of the board. A single screw through the hole in the top will fix this bell, as at (D). It is as well to use a metal washer under and above the bell, so that the screw, which must not be driven in too tightly, will not mute the sound.

A simple form of striker is shown by dotted outline at (C). This consists of a shaped piece of plywood, pivoted with a screw where shown, and held in contact

With the striker suggested, a wooden washer under it where it is pivoted, will raise it high enough above the base to contact the bell at its best sounding point, and where it does contact the bell, a metal-headed chair rail might be driven in to ring it more effectively.

For the trump cards, two or more pieces of cardboard must be cut. With good quality card, that has a nice white surface both sides, two only will serve, both sides being used. With common card, it would be as well to paste over it a sheet of good white paper. See these cards make an easy sliding fit in the frame.

On these the trumps can be neatly inked in and coloured red or black, as necessary, either with ink or water colours. An effective method is to outline first in pencil, then colour, and

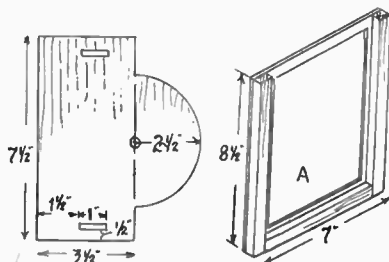


Fig. 1—The base

Fig. 2—Details of the frame

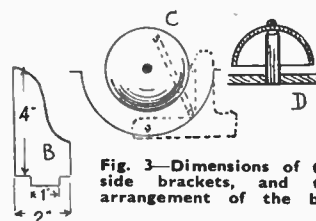


Fig. 3—Dimensions of the side brackets, and the arrangement of the bell

with the bell by an elastic band or spiral spring, the latter going under the bell and being hooked to a conveniently placed screw-head. Ingenious readers may, in place of this, utilise the original striking apparatus instead, if not too troublesome.

finally outline again with Indian ink. Another good method is to cut the trumps from coloured and black paper, then to gum them on. To each card, at the top, glue a short piece of tape for withdrawing and changing. The cards can, of course, be retained in the frame when not in use.

No cutting list is given with this article, as it can mostly be made up from any scrap material available. (363)

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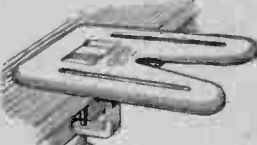
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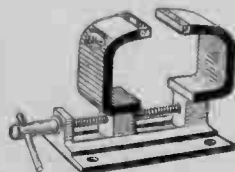
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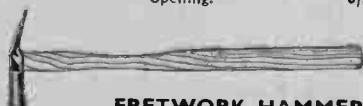
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Hobbies

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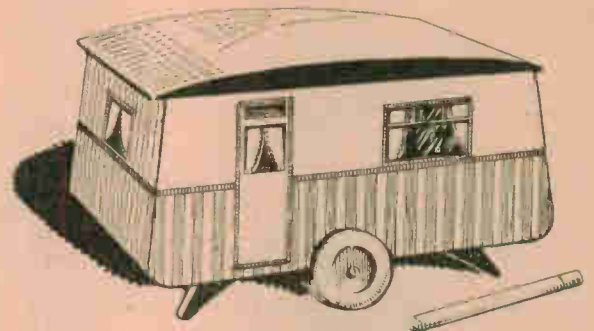
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September 26th, 1951

Price Fourpence

Vol. 112 No. 2917

You should make this NOVELTY CARAVAN CIGARETTE BOX



THIS is a cigarette box in which novelty-seekers should find interest and enjoyment. As will be seen from the sketch in Fig. 1, it is fashioned after a modern trailer caravan, and can be painted up appropriately or polished.

The fretsaw enters largely into the work, as will be seen from the diagrams given full-size as a pattern sheet on Cover 3. The body of the caravan forms a spacious box for the cigarettes, which are intended to lie crosswise and are easily removed after the roof has been lifted off.

The method of making-up can plainly be understood from the details in Figs. 1

and 2. On a plain floor (A) Fig. 1, two shaped sides (B) are glued, and between these sides the two ends (C) are fitted. Then inside the box thus formed there are two sloping inner ends (D), so arranged that the cigarettes are easily drawn out. A plain shaped lid (E), with an interior oblong piece (F) glued inside it to hold it in place, is shown being raised off the box. The chassis carrying the box is shown in Fig. 2 and consists of the two shaped rails (G), and the cross axle (H) to which the wheels are later fixed.

The two projections at the ends of the rails (G) hold the box level, there being just sufficient clearance, without lifting the whole article, to run the 'van' about on its wheels. Suitable turned hard-wood wheels $1\frac{1}{2}$ ins. in diameter and $\frac{3}{8}$ in. thick may be bought from Hobbies Ltd. or, of course, a pair may be cut from $\frac{1}{2}$ in. wood with the fretsaw. The bought wheels, however, having sinkings turned on their faces, are more realistic than the made ones, and the edges, too, are well shaped and smoothed off, and may well be painted up realistically to resemble the real thing.

First cut a plain $\frac{1}{4}$ in. thick piece of wood for the floor (A), 5 ins. by $2\frac{1}{2}$ ins., taking care to get the edges square so that the sides and ends fit nicely. Now make the sides (B) from the full-size pattern given. This outline can be pricked off on to the wood direct, and the outline pencilled in ready for cutting round with the fretsaw. Note the dotted lines on the pattern, and mark these in also so that the parts (C) and (D) will later on take their proper places. Use the fretsaw now in cutting round the outline, and, after cleaning the edges with fine glasspaper, proceed to lay this cut-out on the second piece of wood for the side, and draw round it with a fine pointed pencil. Cut this out the same as before and clean it up. Now take the floor piece (A), and glue it between the sides, keeping it carefully to the dotted guide lines on the sides. Note here that the top surface of the floor comes in line with the top of the curve of the opening for the wheels.

The Ends

For the ends (C) we have two plain pieces of $\frac{1}{2}$ in. thick wood $2\frac{1}{2}$ ins. long by $2\frac{3}{4}$ ins. wide. This means that the grain of the wood will run crosswise to facilitate the shaping after the ends have been glued between the sides. A full-size diagram of one end is given on the pattern sheet. Small wood dowels about $\frac{1}{8}$ in. diameter and $\frac{1}{2}$ in. long must be drilled for and the dowels dipped in glue

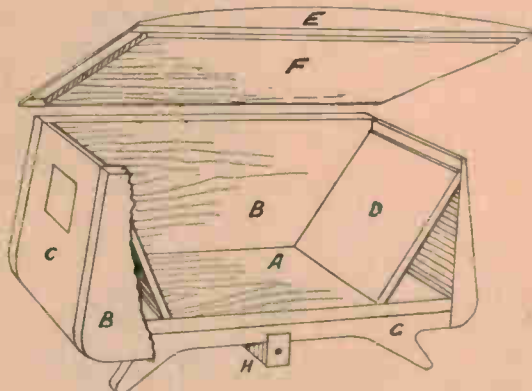


Fig. 1—Showing the main constructional details

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and driven through the sides at a point shown as (X) on the pattern. These dowels hold the sides with the ends perfectly rigid when it comes to doing the shaping, as shown in the detail Fig. 3.

This last detail plainly shows how the ends must be positioned so as to get the correct shaping, this latter being done with the knife and a small wood rasp, the sides (B) being all the time used as a guide to the amount of wood which must be cut away. Care must be taken not to damage the edges of the sides during the process of paring away the unwanted wood of the ends.

The two partitions (D) are next made, and are prepared from $\frac{1}{2}$ in. wood. A full-size diagram is provided on the

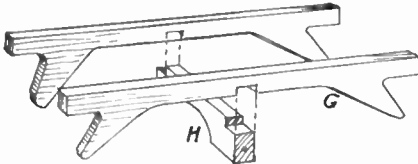


Fig. 2—The chassis

pattern sheet for the outline, and the section of the chamfers on two edges where they meet the floor and the end of the box is shown. The pieces are glued each end.

The lid of the box consists of the two pieces, (E) and one piece (F) (Fig. 4). Pieces (E) are given full size on the pattern sheet and are cut from $\frac{1}{2}$ in. stuff. Between these two pieces is glued a piece of $\frac{3}{8}$ in. deal $5\frac{1}{2}$ ins. wide by $2\frac{1}{2}$ ins. long. This grain arrangement again allows of easy shaping, using the two outside pieces (E) as guides while trimming away (see detail in Fig. 4).

Take care not to damage the outer faces of pieces (E) while working the shaping of the middle piece (F). The two rails (G), forming the chassis of the van, are given full size on the pattern sheet, together with the cross axle (H) which fits between them.

The rails (G) are cut from $\frac{1}{2}$ in. wood, while the axle (H) is $\frac{3}{8}$ in. thick, which allows a firm fixing for the wheels. Fig. 2 shows how the axle goes in the recesses of (G) where it is glued.

All three members when glued up can be fixed to the underside of the floor (A), a couple of screws being run through the floor into the top edge of axle (H). On the pattern sheet, the outline of the wheels is given at (J), if it is desired to make these from the $\frac{3}{8}$ in. wood. A thin metal washer should be placed beneath the heads of the round-head screws during fixing.

It only remains now to thoroughly clean up the woodwork and make all surfaces quite smooth with fine glass-paper. When cleaning off the sides of the

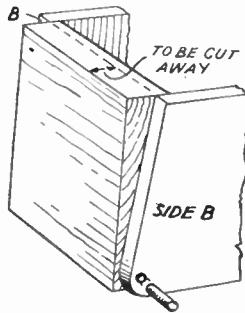


Fig. 3—How the ends are made

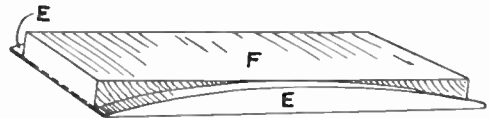


Fig. 4 Details of the roof

french polish laid on with a fine-hair brush. This finish requires to be carried out in a very warm room to get a good even flow. (469)

Replies to Radio and Electrical Queries from Readers . .

Missing Lead

I HAVE a *Cossor Melody Maker 4-valve set*, but it has only two grid bias leads, G.B.1, G.B.2; there is no Negative lead in the set, which I am sure is not correct. I have looked for a broken lead, but have not been able to find one. It has quite good volume, but the sound is very distorted; otherwise it is a good set. (G.E.F.—Moulton).

IT appears that the positive grid bias lead is absent, though this cannot be stated for sure without fuller knowledge of the circuit. The positive grid bias lead normally goes to the negative high tension lead. In the case of volume control being obtained from a bias potentiometer (usually combined with the on/off switch) the absence of bias (besides being detrimental to the valves) could result in the volume control not functioning properly, which might cause overloading on local stations. With such a circuit, the grid bias positive lead will also be switched off, a 3-point switch dealing with this, in combination with the L.T. negative lead.

This switch can be located by following these leads. Absence of bias will result in reduced valve life and greatly increased H.T. consumption, so this should be looked into.

Winding Transformer

WOULD you please give me details of winding my own transformer from 230 volts down to various voltages, such as 23, 12, 6, 2.5. (C.F.—Grimsby).

MAINS transformers have been dealt with in back numbers of *Hobbies Weekly*. With a core of 1 sq. in. cross-sectional area, eight turns per volt are used. You will, therefore, require 1,840 turns for the 230 volt primary, 20 turns for the 2.5 volt secondary, 48 turns for the 6 volt secondary, and so on. The gauge of wire will depend upon the current to be taken. 20 S.W.G. can be used for up to 1 amp. for the secondary; 16 S.W.G. for 2 to 3 amps.; 14 S.W.G. for 4 to 5 amps. The primary current will be less, and can be found by dividing the voltage rating of the secondary into the primary, and multi-

plying the result by the ampere current of the secondary; then add 40 per cent to compensate for losses. For the primary, 26 S.W.G. wire will handle up to .2 amp.; 24 S.W.G. up to .4 amp., and 22 S.W.G. up to .6 amp. Proper care must be taken with winding and insulation throughout.

Electric Clock

COULD you give me details of constructing a simple electric clock which is powered by a 4.5 volt dry battery? (C.W.—Leigh-on-Sea).

IF an electric clock is to prove sufficiently economical to operate, a high standard of workmanship is required. Briefly, a pendulum turns a ratchet-wheel one tooth at each swing, in the more usual type. The swing of the pendulum is maintained by an electro-magnet, which attracts an iron piece on the pendulum. This magnet should have many thousands of turns of fine wire, to keep current consumption down, and it is wired to contacts operated by the pendulum, so that it is only energised when the pendulum is swinging towards the magnet. A suitable gear-train operates the hands from the ratchet-wheel.

A hinged base is the secret of this NOVEL SOILED-LINEN BOX

THE novelty of the box illustrated on this page lies in the hinged base. When emptying the box, instead of picking out the clothes one by one from the top, all that is necessary is to undo the catch and shoot the clothes out as shown in the picture. If the top is covered with suitable material, such as cork, the box could also serve as a seat in the bathroom. In this case, however, it will be necessary to make the total height about 20ins. instead of the 24ins. shown in the diagrams.

Overall Dimensions

The measurements in Fig. 1 show a box 24ins. high by 18ins. square. For a family of four this will be found quite a handy size, but since there are no intricate details in the construction, it will be easy for the worker to modify the size to suit his requirements.

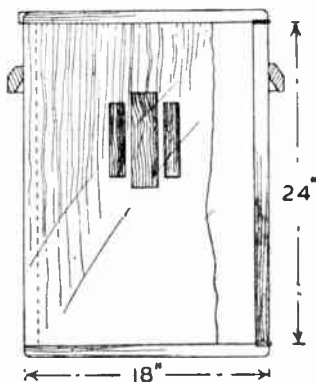


Fig. 1—The general dimensions

To get the size of 18ins. square you will need two sides 18ins. by 24ins. and two 17ins. by 24ins. These can be made from ½in. material of full width if obtainable or can each be constructed of two or more boards joined together. We recommend dowelled and glued joints for this purpose. Alternatively the boards can be simply butted together and secured at the back by battens. The dowel joint is shown in Fig. 2 and the inset shows how the dowel must be shaped slightly before gluing in place. The boards should be cramped together until the glue has hardened.

Constructing the Box

The sides can be screwed or nailed together with a triangular fillet glued on the inside as shown in Fig. 2. Long slender nails should be used and these should be dovetailed, that is in pairs and at opposite angles.

The second method is called the angle lap joint—also shown in Fig. 2. In this case part of one side is cut away to form a rebate and the other side nailed in position. The addition of glue will,

naturally, strengthen the joint. In the case of the angle lap joint, the width of the shorter side will be 17½ins. instead of 17ins.

The Lid and Base

The base will be 18ins. square and the corners can be slightly round for better appearance. It is hinged in place with butt hinges which are let into the side and base to make a flush fitting. The hinges should be of stout quality. Any small metal catch of the hook type will serve to keep the base in position. The lid is constructed similarly to the base, but there will be a small projection on the side opposite the hinges. This is used for lifting the lid.

The Wooden Handles

These are cut from 1in. thick wood and are shaped as shown in Fig. 4. They should be about 4ins. long. The shaped parts are cut away with a chisel. Countersunk screws are used for fixing, and the heads afterwards filled. Alternatively a pair of modern chromium plated or plastic handles must be carefully glasspapered to avoid



splinters injuring the hands when the box is in use.

Painting

To prepare the box for painting, first clean down with fine grade glasspaper.

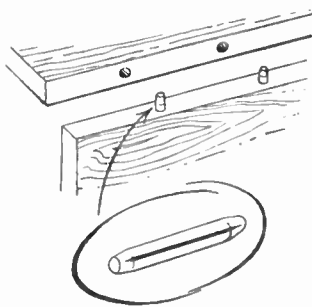


Fig. 2—Details of the dowel joints

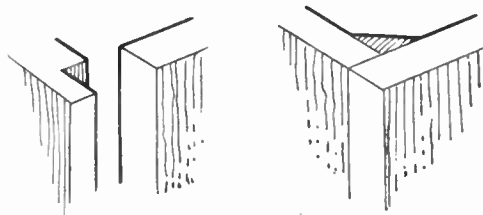


Fig. 3—Alternative joints

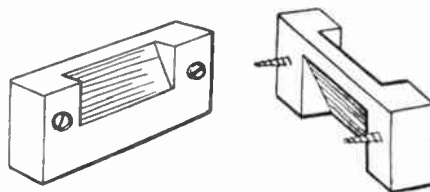


Fig. 4—How the handles are shaped

BIND YOUR 'HOBBIES'

With this issue we come to the end of Vol. 112, and many readers will be thinking of binding their copies, so that they can be used as a permanent work of reference. We have a number of smart red binding cases available, especially made for 'Hobbies Weekly' and neatly lettered in gold. The price is 4/6 post free, and orders should be addressed to The Editor, Hobbies Weekly, Dereham, Norfolk.

If there are any small nail holes to fill, go over these with a little paint before filling. Putty can be used for this job, but should be allowed to harden a little before the first coat of paint is applied. High gloss enamel should be used, giving three thin coats, allowing each to harden. Rub down with fine glasspaper after the first and second coats.

If any decoration is required it may be in the form of thin overlays as suggested in the picture. These can be painted separately and glued on when the paint is dry. A contrasting colour should be chosen. To glue in place first scratch away a little paint from the side to allow the glue to hold securely. (450)

How you can make a STAND FOR A WIRELESS



The four centre rails are of $1\frac{1}{2}$ in. by $\frac{3}{4}$ in. wood and differ from the top rails in that the tenons in this case are not mitred. It is a kind of stub tenon, the details being shown in (C) and (D) Fig. 2.

the shelf, No. 5, which is of the same overall dimensions. If possible, each of these two pieces should be in one piece and of the same quality and variety of wood as the legs.

Alternatively, $\frac{1}{2}$ in. plywood or even hard-board can be used. Since the top and shelf both rest upon rails it is also possible to make them of two or more

THE small portable wireless, incorporating all-in-one dry batteries, is growing in popularity. It can be used when picnicking, on holiday, in the garden or indoors, and it is in answer to a demand for a stand for the latter use that we have prepared this article. Incidentally, the article described will serve well as a plant stand.

Materials

It is extremely difficult to find just the right kind of wood these days, but we suggest that you at least try to procure wood of all one kind. It is sometimes possible to salvage good quality pieces from an old piece of furniture no longer required. In any event, not much wood is required, and the whole will not cost more than a few shillings.

A detail of the general construction, showing the various parts numbered, is given in Fig. 1. You will see from the dotted lines that the rails 1 and 2 are tenoned into the legs.

Making the Rails

Commence by making the four top rails, No. 1, cutting these from 2 in. by $\frac{3}{4}$ in. material. They are $11\frac{1}{2}$ ins. long and a mitred tenon is made at each end. The details (A) and (B) in Fig. 2 show exactly how the tenons are cut and mitred.

All the rails should be marked out according to the measurements, and the tenons cut with a tenon saw. Keep the cut on the outside of the line to avoid cutting the tenons too small, and when cutting the mitre on the top rail keep the saw perfectly upright and hold the rail firmly in the mitre block. Clean up the rails with coarse and then fine glasspaper and then commence on the legs.

Making the Legs

Select four pieces of straight-grained wood free from knots. They should measure approximately 2ft. 6ins. long and $1\frac{1}{2}$ ins. square. Plane square, smooth, and then proceed to mark out the mortises for the rails.

The details of the mortises are shown in (E) Fig. 2. Mark out each mortise, using a square, and laying the legs No. 3 together to ensure that all are identical. Mark the mortises on two adjacent sides of each leg. Most of the mortises can be taken out with a brace and $\frac{1}{2}$ in. bit, and the rest with a chisel. In this case you will cut on the inside of the line to make a tight fit when the rails are glued in place. The cut away diagram (F) in Fig. 2 shows how the mitred top rails fit into the leg.

Making the Top and Shelf

The top, No. 4, which is 12 ins. square, will be from $\frac{1}{4}$ to $\frac{1}{2}$ in. thick, depending on material available, and this applies to

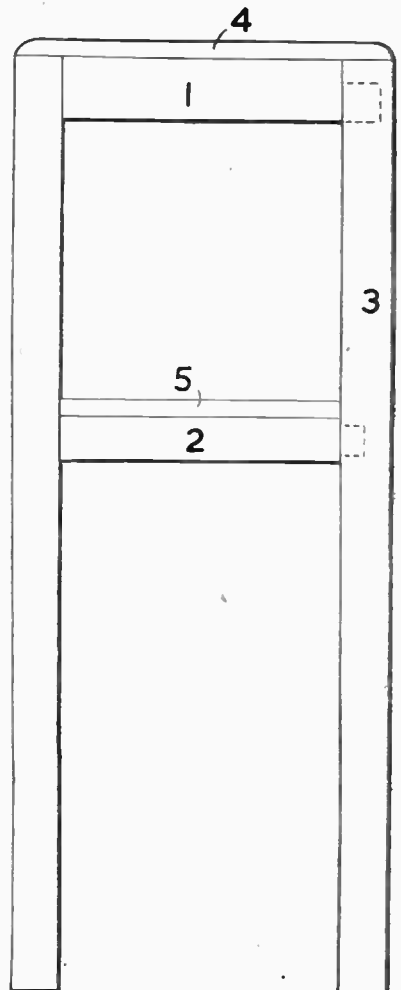


Fig. 1—The various parts numbered

narrow pieces butted together. Providing the butt joint is well made, it will be hardly noticed. The shelf must have a portion cut from each corner to fit round the legs.

Assembling

Assemble the legs and rails in pairs, in

(Continued foot of page 373)

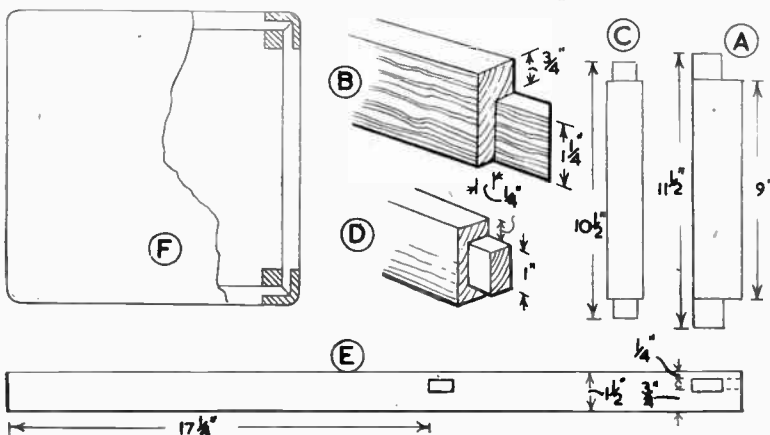


Fig. 2—Some helpful details and measurements

Some good advice on STOCKING A HOME AQUARIUM

THERE is endless pleasure in stocking a home aquarium, and plenty of fun, too.

A really colourful home aquarium depends upon careful stocking. This includes healthy green plant life, well-conditioned fish, adequate food, and several attempts to find such a fine balance of life that the water will last for weeks.

Display of Stock

To display your stock to its best advantage you must house it in a glass tank of fair size, say, 12 ins. square, and 16 ins. high. Undoubtedly, the cost of this is the biggest outlay, but it is well worth the effort of saving to buy one, because such a deep tank draws far more admiration in the home than a wide and shallow object.

Your coarse sand layer on the bottom of the tank must be 2 ins. deep. On this you can position three or four large round pebbles. These will certainly look effective, and provide a cheap means of weighing down the roots of the aquatic plants until they have a firm bind in the sand. Another way of coaxing these plants to root is to use clamp-sinkers, harmless, pliable pieces of metal which fasten around the roots or stems of the water plants, and drop into any required position to keep the plants permanently erect in the water.

Oxygenating Plants

Two kinds of very good oxygenating plants which look so well in this kind of aquarium are the *vallisneria*, and the *elodeadensa*, better known as the Canadian pondweed. The former is a tropical weed of curling and straight varieties, which you will have to buy, and the latter you can find in most of our canals, ponds, and streams. A creeping rootstock is the arrowhead, which forms bulb-like tubers in the sand. The name of this weed is very suitable, because its last full-grown leaves rise out of the water, and just look like arrowheads. All these plants

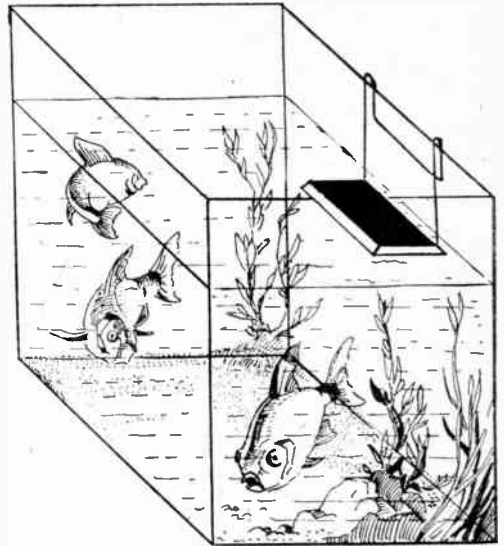
look very attractive in the water, and the fish droppings help their growth.

The hardest working window-cleaners you can possibly employ are two or three common ramshorn snails. With their long and slender tentacles, these brownish-red creatures will always look after your front window, and keep it clean, because they have to come to the top of the water to breathe, and in so doing slide up and down the inner surfaces of the tank.

Now, concerning your choice of fish. For sheer attraction, goldfish are certainly the best to rear. Their locomotion is slow, and they show you such a lot. You can see the action of the gill-covers, as the water passes over the gills, to take the oxygen out of the dissolved air. But goldfish are expensive. Their food has to be varied, and some of it bought, they easily catch chills if a change of water is lower in temperature, they are susceptible to an ailment called fungus, which is a kind of white fluffy growth on the fish, and, if you permit any deficiency in their fresh food, they quickly get constipated. They show this state by trailing their droppings. The remedy, by the way, is finely chopped worm or a commercial food called *Daphnia*, which is live fresh-water flea.

Other home aquarium fish with quicker locomotion but less expensive are the ten-spined and three-spined sticklebacks, the comet, and the shubunkin. They are hardy and easily satisfied with bloodworms and ant-eggs. You can supplement these with patent fish-food extracts without demur, but you cannot substitute one for the other. The bloodworms and ant-eggs must be the basic food.

Two comical amphibians with very amusing antics, strongly different from the stately goldfish, are the newt and the crested triton. These creatures use



up very little of the oxygen in the tank, because they are so busy finding their own. If you are going to rear these successfully, you will have to help them a little beforehand by providing a small wooden platform with bevelled edges, the same as is shown in the diagram, in which you can see that the platform rests on the surface of the water at one end of the tank. When all is ready and the creatures are in their new home the comedy begins and never stops. They come up one after the other for air, and use the platform to rest upon while taking a 'breather'.

Making Water Last

To make the tank water last for a long time remember to cut off dead leaves of plants, do not over feed your fish because uneaten food very quickly fouls the water, and do not allow too much direct sunlight to fall across the aquarium. This precaution will prevent the growth of algae on the inside of the glass, and so ease the labours of your window-cleaners. (464)

Stand for a Wireless—(Continued from page 372)

other words, join two legs together by means of one top rail and one centre rail. Glue should be used for this purpose and the legs cramped together tightly until the glue has set. Heavy weights, piles of books or any such objects at hand will serve in lieu of cramps. When it is judged that the glass is quite set, say about twenty-four hours, the two pairs of legs can be joined by the remaining rails. These too must be cramped or weighted, as before, until the glass is perfectly dry. Test with a square at each step to ensure

that all parts are true and square before leaving the glue to set.

The top and shelf can now be fixed securely in place by means of countersunk screws. Mark the positions first and drill holes to take the particular size screw you are using. Countersink the holes and fill these after driving the screws firmly home.

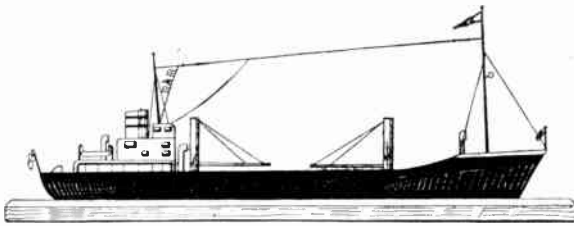
Finishing

If you are fortunate enough to have procured nicely grained wood we suggest

that you fill the grain first with some proprietary brand of wood-filler and then stain and polish. If a light finish is required and the wood is suitable, then rub linseed oil in to give a pleasing depth of colour and finally polish with a good wax polish.

The other obvious finish is high gloss enamel. In this case it will be made to harmonise with a particular colour scheme or even with the wireless itself. Providing the grain is well filled two coats should be sufficient to give a pleasing appearance. (466)

It isn't difficult to make A MODEL CARGO SHIP



THE construction of this little ship is best started by shaping the hull-block (A) as shown in the diagrams and mounting on to it the fore-castle (B), the superstructure (D) and (E), the wheelhouse (F) and the hatch-covers (O-O). These parts, as well as most others composing the model, should be securely glued together, and when the glue has set really hard, but on no account before, the work must be rebated with a fine file along the lines (X-X) to accommodate the topsides (C).

As will be seen from the part list, the topsides are made from thin card to the shape shown in the diagram and made so that they will fit snugly into the rebates just prepared. Having made the topsides and being satisfied that they will make a true fit, set these parts aside until later in the work: if they are fitted at this stage, they will only get in the way and probably sustain damage.

Next, the funnel (G), the ventilators (H) and the derricks (J) should be made and glued into suitable holes drilled in the hull and superstructure blocks to receive them. The funnel is shaped as

shown in the diagrams: the derrick-jibs (J) are merely brass pins pushed into position and which will in due course be painted over.

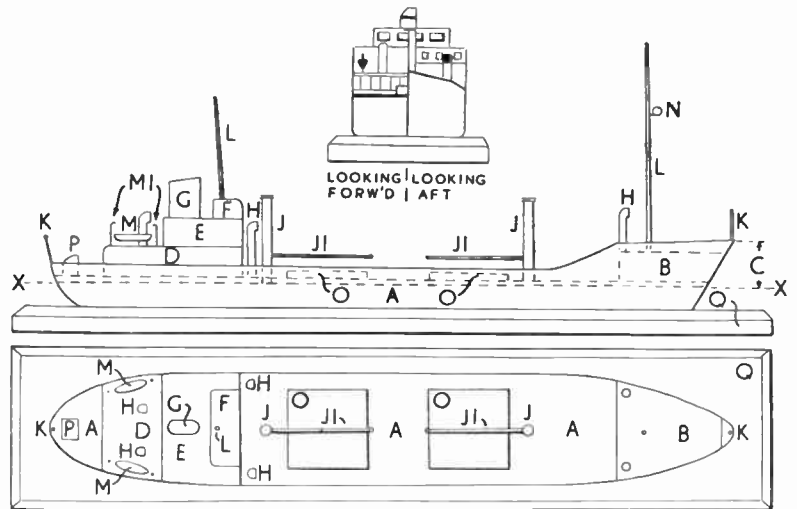
The lifeboats (M) are made from scraps of wood but

the davits (M) are fashioned pieces of brass or copper wire bent to a suitable shape and set up in small holes drilled in the superstructure.

This completes the greater part of the woodwork which can now be glass-papered thoroughly, treated with wood-filler and then glasspapered again—this time with fine paper to obtain a smooth hard surface suitable for painting. The topsides (C) may now be fitted, glued into position, treated with wood-filler and finally smoothed down to a surface true and fair with the work adjacent to them.

Masts and Rigging

The masts are made either from pieces of wood of suitable length and



Plan, side and end views of the model

PART LIST

Name	No.	Size	Material	Finished colour
A Hull block	1	8 3/8" x 1 1/2" x 3/8"	Wood	Black/red below water line
B Forecastle	1	1 1/2" x 1 1/2" x 3/8"	Wood	—
C Topsides	2	9 1/2" x 2"	Cardboard	Buff/black
D Superstructure	1	1 1/2" x 1 1/2" x 3/8"	Wood	Buff
E Superstructure	1	1" x 1 1/2" x 3/8"	Wood	Buff
F Wheelhouse	1	3/8" x 1" x 1/4"	Wood	Buff
G Funnel	1	1/2" x 3/8" x 1/4"	Wood	Yellow—blue bands Red—black bands
H Ventilators	6	3/8" x 1/4" x 1/4"	Wood	Buff
J Derricks	2	1 1/2" x 1/8" x 1/8"	Wood	Buff
J1 Derricks (jibs)	2	—	Brass pins	Buff
K Flag staff	2	—	Brass pins	Buff
L Masts	2	1 3/8" and 2 1/2"	(See text)	Buff
M Lifeboats	2	1/2" x 1/8" x 1/8"	Wood	Buff
N Light	1	—	Glass bead	—
O Hatch covers	2	1" x 1" x 1/8"	Wood	Buff
P Hatchway	1	1/2" x 1/2" x 1/4"	Wood	Buff
Q Baseboard	1	9 1/2" x 2" x 3/8"	Wood	(See text)

shape or from pieces of copper or brass wire. Whichever material is chosen, however, it should not exceed 1/8 in. in diameter and should have a very slight taper.

The masts are secured in position by drilling small holes into which these parts may be set. A spot of glue at the bottom of each mast will help to make it firm. Rigging is of cotton thread throughout and is fastened with glue at all points of contact with the ship or masts. Flags are of paper or card painted to choice, while the aerial insulators are small spots of glue sited at appropriate points on the aerial.

The lifeboats are secured with cotton loops to the davits—the wire making these fittings being bent to form an 'eye' through which the hooks may pass.

Deck Fittings

These are left entirely to the choice of the reader, but whether these fittings are made at home or bought as finished products, it is most important to remember that the scale of this model is extremely small. As instances, if approximate scale is to be achieved, as it

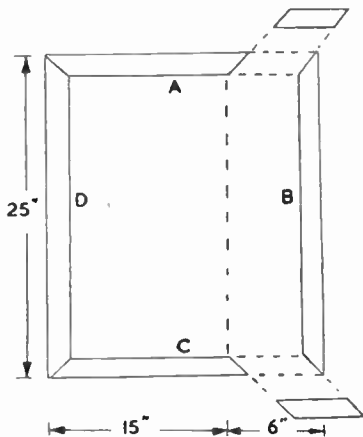
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For those 'walking' novelties

A TOY RUNWAY

WE know that toys are becoming more plentiful on the market now, but this should not deprive the handyman of the pleasure of making his own when birthdays are in the offing—especially children's birthdays. The illustration shows a colourful source of amusement which the writer has recently completed. It was made from a second-hand picture frame with a ply-wood backing.

The following are instructions using a frame measuring 21ins. by 25ins. Sides



How the picture frame was reduced in width

(A) and (C) are cut down to 15ins. each and the ends mitred so that side (B) can be replaced in the new position. The ply backing is also cut down to the required width and fixed into the new frame by means of the original pins. If necessary a further thickness of cardboard can be laid over the back before tacking.

The upright, supplied with apertures of different widths for scoring, is made out of the plywood which was cut from the original panel. This would make it 6ins. high. Its length was reduced to correspond with the width of the frame, and then the openings were cut away. It will be seen that these openings are of varying widths, the narrowest, of course, bearing the highest scoring points and the points getting lower, the wider the opening. It is held in the upright position by means of slots sawn into the lengths of the frame (B) and (D), placed about 3ins. from the far end (A). This makes it a collapsible structure for convenience when not in use.

The particular model illustrated was intended as a runway for those little 'walking' horses so popular among children at the moment. When end (B) is raised, by placing a book or other suitable object underneath it, the horses

will walk down the incline and might be persuaded to enter one of the openings, thus scoring whatever number of marks is indicated on the board above it.

If preferred, toy motor-cars can take the place of horses. It simply means cutting the scoring apertures to a suitable width. The use of a picture frame prevents the toys from falling off the edges of the board.

After completion the plywood runway can be stained, or coated with linseed oil. Other suggestions include beading round the three edges of the upright, this painted in white enamel with the numbers in red, and the frame painted green.

Not So Simple

As a game, it looks a fairly simple matter to get a consistently high score. On the contrary, a surprising amount of skill and chance will be found necessary, as toys have a habit of running at a tangent. This has the advantage of being both an indoor and outdoor game, being just as interesting in the garden as on the dining-room table. (451)

Model Cargo Ship—(Continued from page 374)

has been in the diagrams, an anchor should not exceed $\frac{1}{8}$ in. across the flukes; the winch drum diameter should not be greater than $\frac{3}{8}$ in., while the links of an anchor chain should, if possible, be less than $\frac{1}{8}$ in. in length.

Mounting and Painting

The model should be mounted on the baseboard (Q) which, after planing and chamfering, should be thoroughly smoothed with glasspaper, treated with wood-filler and re-papered to obtain a really good finish. The baseboard may be stained and varnished or stained and french polished according to personal choice. Alternatively, the board may be painted black or some other colour. Two $\frac{1}{2}$ in. brass screws driven from the underside of the baseboard will secure the ship in position.

The model should be given a coat of size, which should be quite dry before painting is commenced. Two under-coats are recommended with a rub down with fine glasspaper between each. Final colouring is a matter of personal choice, but suitable colours are indicated in the part list for readers who may be in doubt.

Plank marks on the decking and the window and port openings on the

superstructure are drawn with Indian ink. (418)

A Schoolboys' Model



Boys of the Piggott Modern Secondary School, Wargrave, Berkshire, recently built a scale model of a 16th Century drawing room. Here, two of the boys, David Burrows and Kenneth Tappenden are seen working on the model.

The amateur can make this BOOK-TABLE FOR AN ARMCHAIR

A PART from its usefulness as a piece of furniture, the item described is one that is suitable for every type of amateur woodworker to undertake, whether he be a 'saw and hammer' novice or an experienced craftsman with a keen pride in well-fitting joints and clean finishing.

After cutting the various pieces to outline, ignoring the cross-check and housed joints, the novice can assemble the stand with glue and screws, but a stronger method of construction is detailed below.

Check Measurements

It is assumed that the book-table will be made to stand against a particular chair, in which case the various dimensions should be checked to ensure that the table is of the most suitable size. The top shelf should come just below the arm

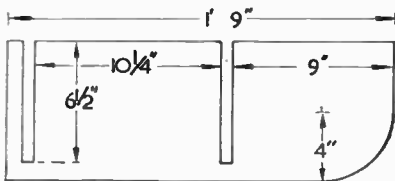


Fig. 1—Details of the top and bottom

of the chair where it will be in a handy position to take a cup and saucer, plate, ash-tray and so on. The shelves should not extend beyond the ends of the chair, but if the distance between shelves is found to be more than about 10ins. it is advisable to raise the fitment on small legs and thus keep the height of the shelves in proportion to their length.

Almost any timber is suitable for the making of the shelves, though naturally a stained and polished hardwood will be most attractive in appearance. Softwood, if used, should be finished off with brush lacquer. Certain softwoods can be obtained free of licence, and an African species called Podo, that many merchants now stock, will be found a nice mild-working timber that takes paint and lacquer very well.

The top and bottom of the table are 1ft. 9ins. long, 8ins. wide and 1/2in. thick. One end is taken off to quarter-round shape (the shaping having a radius of 4in.), and two stopped grooves are worked on the inside face of each. These grooves are 6 1/2ins. long (measured from the uncut edge of the wood), 1/2in. wide and 1/2in. deep. Their position is shown in Fig. 1.

A centre shelf of the same thickness is prepared, but this is only 1ft. 8ins. long. It has the 4ins. radius quarter-circle taken out of the front edge as before, while a 1/2in. wide slot is sawn and chiselled out of the wood on the back edge. This slot is

4ins. long and has its outside edge at 9ins. from the shaped end of the board (see Fig. 2).

The centre upright also carries a 4in. long and 1/2in. deep slot, but this time it is cut on the front edge of the wood (see Fig. 3). This upright measures 1ft. 4ins. high by 8ins. wide.

An end upright is also needed, this being of the same dimensions as the centre partition. It is not slotted, but on what will be the inside face, a stopped groove 6 1/2ins. long (measured from the back edge) and 1/2in. deep is cut, its position being central as regards the height of the upright.

To enable the various parts to be assembled correctly, 'housing' strips must be cut on the top and bottom edges of the uprights at the front, and on the front edge of the unshaped end of the centre shelf. The housing strips are simply small pieces of wood sawn out at the positions indicated, and in all cases the strips measure 1 1/2ins. long (measured across the grain of the upright or shelf) and 1/2in. deep.

Each joint should be tested in turn, any minor irregularities being corrected with

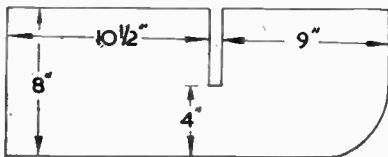


Fig. 2—The centre shelf

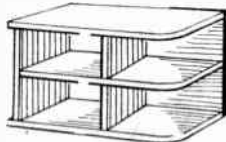


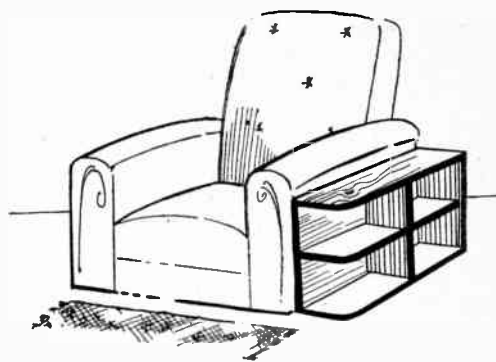
Fig. 4—The parts assembled

a chisel, and the various members can then be assembled.

To assemble the shelves, glue should be brushed on to the slots on the middle shelf and centre upright, and the two pieces slid together. Having tested the angles to make certain that they are dead square, a long oval brad can be tapped through the members at top and bottom of the joint at the back. It is advisable to allow the glue on this part of the framework to set hard before proceeding to the rest of the assembly.

Speed is essential in completing the remainder of the work, and the services of an assistant will be found invaluable.

Glue is put on the end of the centre shaft, and it is put into the slot on the end



upright. A couple of panel pins may be driven through the joint to hold it secure. The bottoms of the uprights are then glued and put into the lower shelf, then the tops of the uprights are similarly treated. After testing the correctness of the angles a couple of oval-headed brads may be driven into each joint to hold it until the glue has set.

After the glue has thoroughly hardened it is advisable to strengthen all joints with fine screws. Having bored out the preliminary hole for the screw shank, the top of the holes should be enlarged so that the screw-head will just comfortably fit into it. When the screws have been driven home, a small dowel may be tapped in above them to conceal the screw-head, or the hold can be treated with plastic wood.

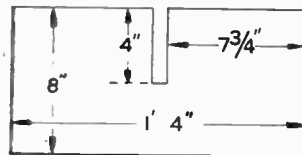


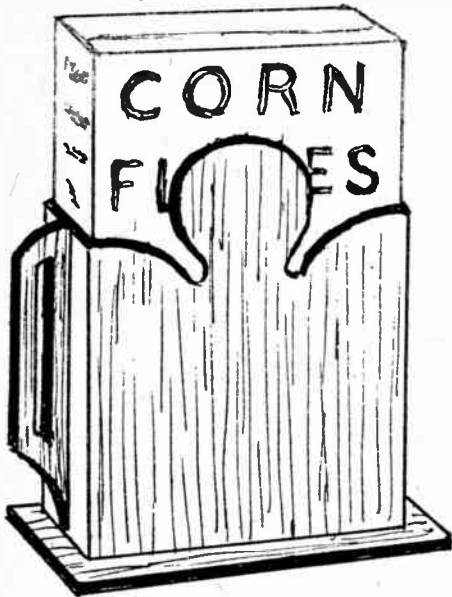
Fig. 3—Dimensions of the partition

In the latter event it is advisable to roll the plastic wood in a little of the stain that will eventually be used on the wood-work. This treatment makes the plastic wood less noticeable than it would be if the hole is first treated and stain applied to the filling later.

A three-ply or 1/2in. thick hardboard panel measuring 1ft. 4 1/2ins. high by 9 1/2ins. wide is then glued and pinned to the back of the fitment at the shaped end. The assembled item will then appear as in Fig. 4.

If the shelves are of suitable height for the chair, the work is complete apart from the normal glasspapering and finishing treatments. If it is too low, it can be raised on feet at the corners, or, preferably, on a solid wooden plinth. This last can consist of a 1ft. 8ins. by 8ins. framework of 1in. thick timber set on edge, the four corners being butt-jointed together. (439)

Serve the 'flakes' from a CEREAL PACKET HOLDER



MANY of the foods that come to us in jars, tins, or some other form of container, may be made quite attractive for the adornment of our meal table. The potted meat jar and sauce bottle are typical examples of this and some very neat holders have been designed to house them.

There appears to be one exception, however—the breakfast cereal packet, and it is also probably the least attractive of the food packages. We are told by the makers to leave the contents in their original waxed papers in order to keep them fresh and crisp. It is not advisable, therefore, to tip the contents into something more attractive.

Smart Holder

The cereal packet holder described in this article was designed to overcome the difficulty. It forms a really useful and smart holder to adorn our breakfast table and also makes the serving of the contents much easier.

By grasping the handle the flakes may be poured out like liquid from a jug. Another useful feature is a light spring, invisible from the outside, which holds the packet securely and prevents it from falling out of the holder when tipped up.

The size you make the holder will depend upon the size and particular type of cereal you usually have—the measurements given are for a family size of a well-known brand and will serve as a useful guide.

The wood for making the holder can be quite thin as the packages are light in weight and there is, therefore, no great

strain anywhere. It should not be necessary to use anything thicker than $\frac{1}{2}$ in. and for the smaller size packets $\frac{3}{8}$ in. should be ample.

Almost any kind of wood can be used—most of the hardwoods being suitable—and they can be left in their natural state or stained and polished. If the holder is to be painted or enamelled, then it is possible to use a softwood or plywood.

The measurements given in the drawings are worked out for wood having a thickness of $\frac{1}{2}$ in., and, with the exception of the handle, the entire case is made of this size.

Cut two pieces for the sides $9\frac{1}{2}$ ins. long and $8\frac{1}{8}$ ins. wide, and with a fretsaw, shape the top edge as shown in Fig. 1. This edge can be left level, but it would look much better with an ornamental top, even if it is only in the form of a half circle.

The two end pieces are $7\frac{1}{2}$ ins. long and 3 ins. wide. Before gluing these pieces and the two sides together, it would be a good plan to cut and fix the handle, as this method produces a stronger and more satisfactory job.

The handle is made $7\frac{1}{2}$ ins. long, $1\frac{1}{2}$ ins. wide and $\frac{1}{2}$ in. thick. Instead of cutting the centre out, a groove may be made down each side to form a satisfactory grip when serving the flakes. Fasten the handle on to one of the ends with glue and three small screws inserted through the end piece and into the handle.

The two top screws are also used to hold the spring in position as shown in Figs. 1 and 2. A piece of sheet brass $\frac{6}{16}$ ins. long, $\frac{1}{4}$ in. wide and of 18 S.W. Gauge cut to shape as shown in Fig. 3 is needed for the spring. Drill two holes in one end and countersink them so that the screws fit flush with the metal and do not catch on the packet.

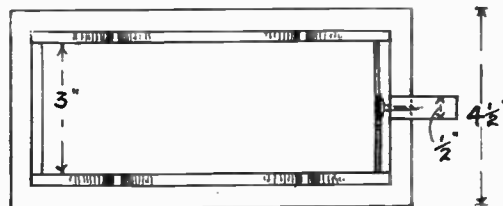
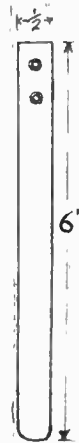
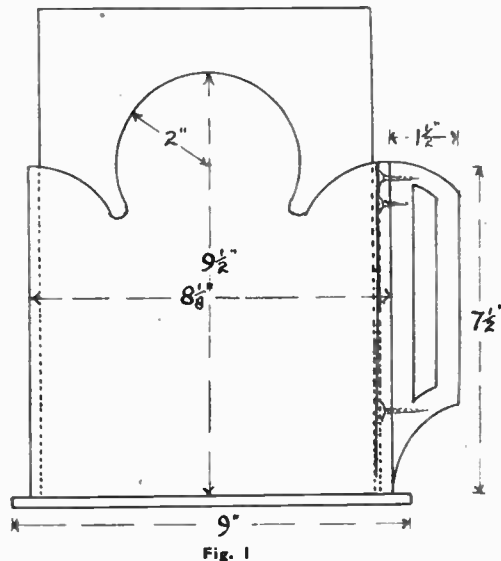
Clock Spring

A piece of clock spring may be used, but it will be necessary to soften it in a gas flame before drilling the holes and shaping the other end.

Having made the handle secure, the case can now be glued together. Extra strength may be given by carefully inserting a few small veneer pins, drilling holes to prevent the wood from splitting.

Cut the base board 9 ins. long and $4\frac{1}{2}$ ins. wide. The top edge may be

(Continued foot of page 378)



For brushes and brooms, etc. — a USEFUL SCULLERY FITMENT

THIS handy piece of household furniture is intended to accommodate brushes, brooms and other items necessary to the household work. It keeps these useful implements in one selected place, instead of scattered about the scullery, and looks neat and tidy. A separate trough-like receptacle provides a place for polishing cloths, and a shelf is added for scrubbing brushes, furniture polish and metal polish, and anything else of equal usefulness in making the home bright.

Suggested Wood

It is suggested that deal, of $\frac{3}{4}$ in. thickness, be used to make the fitment, though timber of other thicknesses could be employed, if available. The lengths of wood, given in the cutting list are calculated on the former thickness,

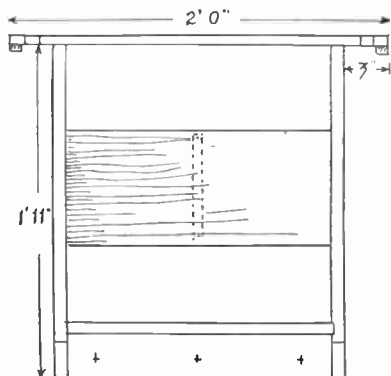


Fig. 1

though, and some little amendment in some parts will be necessary, if different thicknesses are employed. However, there need be no difficulty about that.

A front view is given in Fig. 1, and a side view and section, in Fig. 2, with useful dimensions. Cut the two side parts to length, and where the bottom shelf will come, saw and chisel out a groove across each, $\frac{1}{8}$ in. deep. Where the trough bottom will be fitted, square guide lines across in pencil. Cut the top of the fitment to dimensions given. This extends beyond the sides, and is slotted to hold the long brooms. The sides are to be housed in the top, so cut suitable grooves, $\frac{1}{8}$ in. deep at 3 ins. from each

end, as shown in detail (A) Fig. 3. In the middle of these side extensions, bore a hole through, 1 in. diameter, and from the front edge cut up to the holes to form a slot each side, as at (B) for the handle of the broom to slip in. As the extreme ends of the top will be weakened by these slots, to prevent a breakage, screw and glue 1 in. wide strips of wood to the ends underneath. These are clearly shown in the front view at Fig. 1.

Now cut the bottom shelf, and nail all four parts of the fitment together. Under the shelf saw off the lower corners of each side part. Cut and nail across the trough bottom, then the front of the trough. Note this part slopes outwards, and as the wood is not stout, be careful about driving the nails in the correct place. A pencil line each side would be helpful in this matter. The upper edge of the trough front should be neatly rounded off, not left square; it will be more comfortable for the hands when groping inside the trough for its contents.

It would be an advantage here to nail a division across the trough, and so help to keep the polishing cloths separate, otherwise the housewife might find herself inadvertently using the metal polishing cloths for the furniture before realising the mistake. For the back of the fitment, plywood might be employed, preferably $\frac{3}{4}$ in. thick, but $\frac{1}{2}$ in. stuff would serve if a thickening slip were glued across where the hooks come to provide a stouter foundation for them. Fix the plywood back across, and note it covers the back edge of the

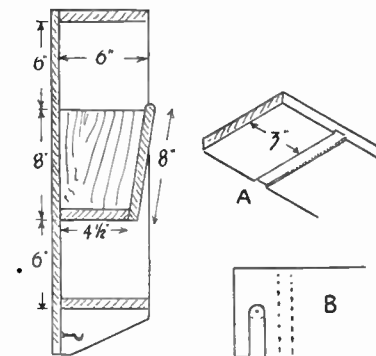
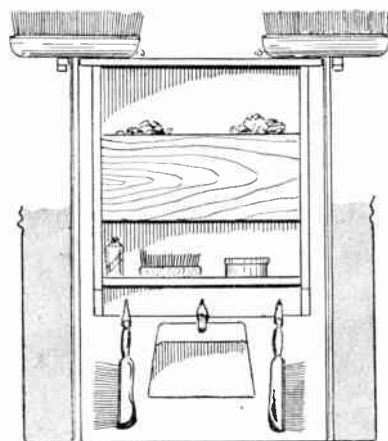


Fig. 2

Fig. 3



top as well as the rest. A few screws used for the fixing of this part are advised, as a strong joint is necessary, the fitment being hung from the wall.

The hooks mentioned are to be driven in the back, just below the bottom shelf. The exact position of these must be arranged to suit the articles they hold, but that is a matter easily settled. The thickening slip mentioned, if necessary, of course, can be 1 in. wide and, say, $\frac{3}{4}$ in. thick, and should be glued across where the hooks are to come, and be further secured with a couple of screws, driven in through the plywood back.

The completed fitment can be left plain, but, unfortunately, plain wood articles tend to soil very quickly, and a coat or two of paint or varnish, does help to keep them both clean, and looks better, too. Screw a pair of brass wall plates to the back of the fitment, and screw or nail through these to the wall of the scullery or kitchen. If a brick wall it will be better to plug the wall, quite an easy job nowadays with Rawlplugs or similar proprietary fittings. (454)

CUTTING LIST

Sides (2)—1 ft. 11 ins. by 6 ins. by $\frac{3}{4}$ in.
Top—2 ft. by 6 ins. by $\frac{3}{4}$ in.
Bottom shelf—1 ft. 5 ins. by 6 ins. by $\frac{3}{4}$ in.
Trough bottom—1 ft. 4 $\frac{1}{2}$ ins. by 4 $\frac{1}{2}$ ins. by $\frac{3}{4}$ in.
Trough front—1 ft. 4 $\frac{1}{2}$ ins. by 8 ins. by $\frac{3}{4}$ in.
Back—1 ft. 11 $\frac{1}{2}$ ins. by 18 ins. by $\frac{3}{4}$ in. or $\frac{1}{2}$ in. (plywood).

Cereal Packet Holder—(Continued from page 377)

slightly bevelled or left square as shown in the drawings. Glue this in position, secure with a few well placed veneer pins and allow to dry thoroughly. Small circular discs can be glued to the corners to form feet and lift the holder from the table slightly if thought necessary.

Give the case a good glasspapering

ready for the final finishing. If a hardwood has been used, it is best to either varnish or french polish the wood in its natural state, but it may be stained if it is to match other woodwork.

Quite an attractive finish can be given to a ply or softwood holder with one of the modern cellulose enamels. Give the wood a coat of size before applying the

enamel, and you will probably find that two coats are necessary in order to give a nice smooth finish.

A transfer fixed to the enamelled surface will help to add to the attractiveness of the holder.

The spring will need setting up slightly, by bending it out, to grip the packet in a satisfactory manner. (455)

For the small hall — a SIMPLE HAT & COAT RACK

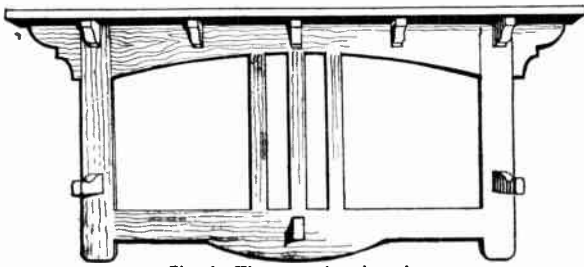


Fig. 1—The completed rack

A READER writes in saying he desires to make a simple hat and coat rack for the small hall of a bungalow dwelling. The whole thing, he says, need not be heavy, as light-weight articles only will be hung on the rack.

The rack illustrated here should be suitable for our correspondent, and for others who contemplate making a fitment for a hall.

As will be observed from the illustration, Fig. 1, there is a little shaping to rails, brackets, etc., which gives the whole some character, and these parts can all be cut with the fretsaw.

Substantial Frame

The rack is based on a substantially made frame consisting of side rails (A), top rail (B), bottom rail (C) and the three upright rails (D). The side rails are 11½ ins. long by 1½ ins. wide by ½ in. thick; top rail 21 ins. long by 2½ ins. wide at the ends and 1½ ins. wide in the middle, by ½ in. thick; bottom rail also 21 ins. long by 1½ ins. wide at the ends and 2½ ins. wide in the middle. The small upright rails are about 9 ins. long by ½ in. wide and ½ in. thick. These will vary slightly in length, however, to suit the curve of the rail (B) to which they are halved and glued.

The top and bottom rails are dovetailed into the side rails, and the joints are secured with glue and screws, while the upright small rails are let into the top and bottom rails as shown in the detail Fig. 2, the projecting ends of the rails being recessed at the back. The method of dovetailing the main rails (A), (B) and (C) is shown in the enlarged diagram Fig. 2.

Getting the Centre Point

In Fig. 3 is shown how to get the centre point for describing the arc of the curved underside of rail (B), and also the curve of the middle portion of the rail (C). The small mortises to take the tenons of the pegs should be cut with the fretsaw before the rails are fixed together, and the size of the tenons are given in the detail of the pegs in Fig. 4.

The shelf (E), is 27 ins. long by 4½ ins. wide by ½ in. thick, and is fixed to the

top edge of rail (B) with brass screws. To form a finish between the ends of the back frame and the bottom of the shelf, small shaped brackets (G) are prepared and fixed as shown in Fig. 3, the working details for these brackets being given in enlarged form in Fig. 5. They are glued and screwed firmly to the underside of shelf (E). The five brackets

(F) are cut from wood ½ in. thick to the shape and measurements given in Fig. 6. Three pegs are shown in the illustrations, but the number could be increased if desired, though this is not to be recommended on so light a framework. The pegs may be cut from ½ in. or ¾ in. wood to the outline given in Fig. 4, the glued tenon giving ample strength for support.

For fixing the frame to the wall it will be best to screw two stout brass plates to the upright rails (A) just beneath the lower ends of the brackets (G). Do not fix the plates to the top shelf member (E). Long brass-headed nails should be driven into the wall, rawplugs or other wall fixing being included.

STAIN REMOVER

To remove ink stains from cloths, soak the stained part in milk for half an hour. Then wash in the usual way, when it will be found that the stains have disappeared.

Almost any kind of wood could be employed for the rack. The best effect would, of course, be obtained with oak, or one of the better cabinet woods. Pine could be used, finished with stain and varnish. If oak is adopted it should be lightly stained and wax polished. (414)

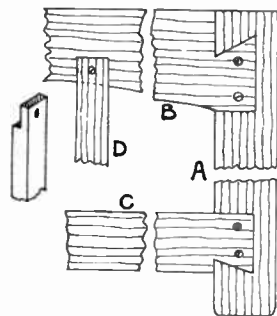


Fig. 2—Details of the main joints

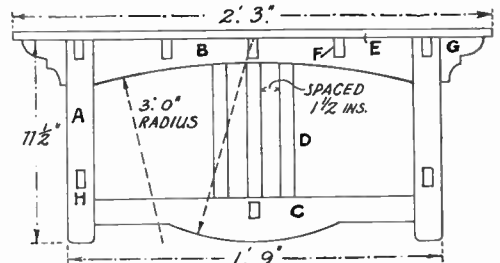


Fig. 3—Dimensions of the rack

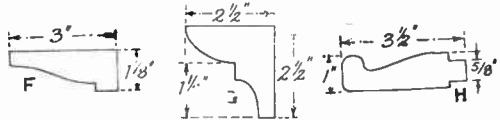


Fig. 6 The shelf supports Fig. 5 The corner brackets Fig. 4 The pegs

Mend That Cracked Basin Yourself

TO the novice, a cracked hand basin—often inadequately patched with adhesive tape—is a symbol of worry and expense. You can insure against cracked basins, but you can also mend them easily yourself.

What you need

All you need is a piece of old linen, some white lead paste and about half a cup full of gold size. This is expensive, so get the smallest quantity you can. White lead paste is cheap but scarce, and you may have to wangle some from a friendly plumber.

Take the linen, and cut a strip to cover the crack. If the basin is badly

damaged, with several cracks radiating from a 'star', cut the linen into a semi-circle with a smaller semi-circle cut out of the diameter to fit round the waste-pipe, so that the whole of the underside of the basin can be covered.

With an old knife spread the white lead paste evenly over the linen and then smear over some of the gold size. Press the linen firmly on to the underneath of the basin, making sure that all cracks are covered, and smooth out any folds.

Sound Again

In a few days the mixture will set very hard, and the linen can be painted to match the basin, which will be quite sound again. (465)

Some practical advice on THE ART OF FRENCH POLISHING

THAT more and more men and women are being tempted to try their hands at French polishing is undeniably true. There are two probable reasons for this. The first is that the task is in itself a fascinating one; while the second is the constantly increasing cost of having such work done professionally.

There is no special outlay required for French polishing beyond the actual materials needed. The thing which is really necessary, however, is to have a room where the work can be done without being disturbed. I say a room because an even temperature is needed, which makes an unheated shed unsuitable for this work.

Five Operations

Perhaps the easiest way of understanding French polishing, is to bear in the mind that the whole process can be divided into five separate operations. It is always a good plan to get these clear in the mind.

As in many other things, good preparations mean everything to the finished work, which is why the initial preparation of the wood surface is so very important. If this is not done properly, the whole effect will be spoilt. The next step is the staining of the wood. This is followed by the oiling, and then the filling of the grain of the wood. Last of all comes the actual polishing itself. Each process takes a certain amount of time, with time between for drying off, and none of these can be hurried, which is another reason why the work is better done in a room not required for use.

Preparation Important

The main reason why the initial preparation of the wood surface is so important is because what would be quite all right for ordinary staining, would not be nearly good enough for the highly polished finished article. Here the slightest roughness in the wood surface is apt to be magnified. A scraper should be used to run over the surface. This pares off fine shavings here and there until a dead level surface is obtained. Now a sheet of the finest glasspaper should be used to rub down the whole surface, special attention being paid to all edges. A good test of the real smoothness of the wood surface is to take the hand gently over it, if there is not a sign of a splinter on it, then the rest of the work can be started.

Stain Necessary?

It depends a good deal on the natural colour of the wood to be polished whether staining will be needed. Where wood is very light in colour, however, and you feel it needs staining, here are the three best types of stain to use.

Water stains are distinctly easier to

use than spirit stains. The reason for this is that, as they dry more slowly, they can be applied more evenly in consequence. Another point about water stains, which is an advantage to the amateur, is that the chance of over staining is minimised, even though it may be necessary to give two or three applications in order to obtain the right depth needed. It is true that water stains take a bit longer to dry for the simple reason that the wood becomes very wet after several applications. There is also a tendency to swell, and this means that the surface will have to have another rub down with glasspaper, to ensure that the surface is once again perfectly even.

Oil stains are excellent for several reasons. They dry slowly, too, and are, therefore, easily controlled. The real advantage of oil stains, however, lies in the fact that the oil sinks deeply into the wood and gives it a lovely depth and richness which is most attractive and lasting. It may be necessary to wait as long as three days between the processes of staining and polishing. It is a good idea to remember that it is not actually necessary to stain the wood quite as dark as you wish it to look when finished, as the final polishing adds depth to the colour. As soon as you are satisfied that the stain is dry, and it must be really and thoroughly dry, the surface of the wood can be oiled. This brings out the grain of the wood. Raw linseed oil should be used for this purpose and it should be applied with a soft rag, using it lightly and evenly. Any kind of rag used for French polishing must not have any odd threads hanging from it, or these will surely ruin your work. Oil should always be used sparingly, for it should be remembered that oil sweats, and may sweat through the polish later and cause it to crack.

Filling the Grain

Next comes the task of filling up the grain of the wood. This is done by rubbing the wood over completely with colour plaster of paris and spirit of turpentine. Another method of doing this job is by painting with a varnish made with 3ozs. of orange shellac, mixed with ½oz. powdered resin and ½ pint of methylated spirits. Should there by chance be any slight depressions, these should at once be stopped by filling with a mixture of melted beeswax and an equal amount of resin.

Now for the great moment; for we have arrived at the last stage, that of the actual polishing. This is the tricky part of the business! A rubber must be made by folding some cotton wool in an old handkerchief. It must be evenly folded so that there are no creases in it.

Make the polish by dissolving 5ozs. of the best orange shellac in 1 pint of

methylated spirits, to which add 1 teaspoon of gum arabic and 1 teaspoon of gum copal. If the wood to be dealt with is mahogany, add 1oz. of Bismark brown. For walnut; add a few drops of spirit varnish. For ebony; add some aniline black. Yellow woods require button shellac, instead of orange; colour to the shade needed by adding a little gambouge. A transparent polish is obtained by using 10ozs. of bleached shellac to each pint of methylated spirit. The three processes of polishing comprise bodying in, building up and spiriting out.

Keep Moving!

It is essential to remember that the rubber must never be left resting in any particular spot. The first stage is the bodying up. This is always the easiest as the oil in the wood prevents any sticking. The second stage of building up is a little more complicated. Glasspaper must once again be run over the surface and every particle of dust resulting from this must be scrupulously brushed off before any polishing starts. Have only two or three drops of linseed oil on the rubber at a time.

Final Stage

The final stage, that of spiriting out, means the process of adding extra lustre to the finished work. Once a certain degree of shine has been attained, the article should be left in an even temperature and where it will be entirely free from dust. It is necessary to make a new pad for each polishing, and this must, of course, be soaked in the French polish as at first. Then a few drops of methylated spirits should be applied to the pad and worked backwards and forwards, always following the grain of the wood. Always work lightly, for in this way an even polish is obtained.

Dull Spots

Should a dull spot be noticed during polishing, never rub this hard. Instead, work gently over the entire surface again, adding a fresh drop of oil to the pad. Leave any furniture which has been French polished for at least a fortnight in a warm room, where it can dry off thoroughly before being either touched or used. The slower your work, the more successful will be the results, for the drier the surface, the better for polishing. (462)

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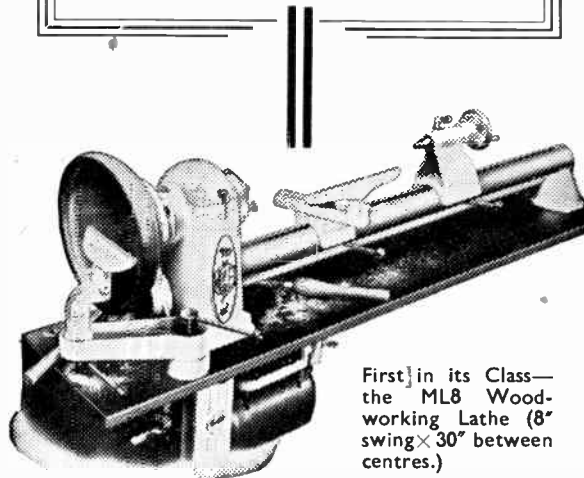
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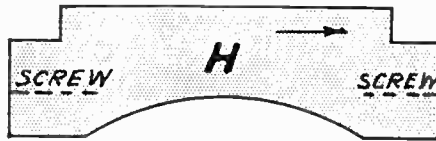
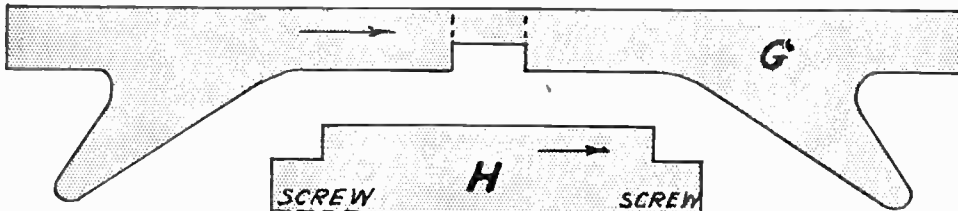
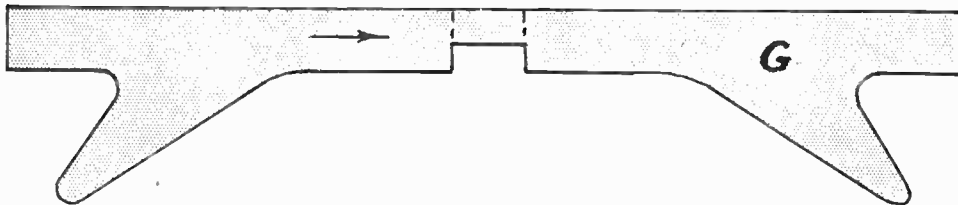
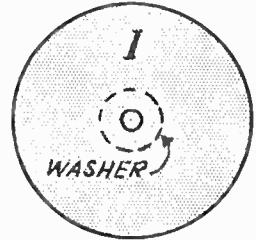
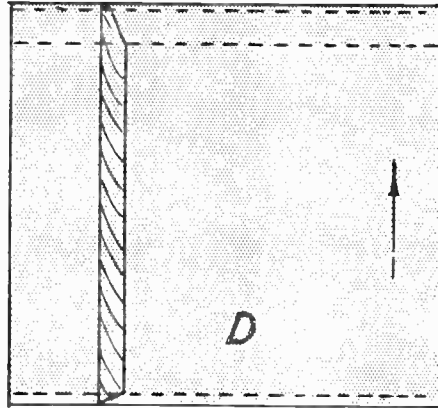
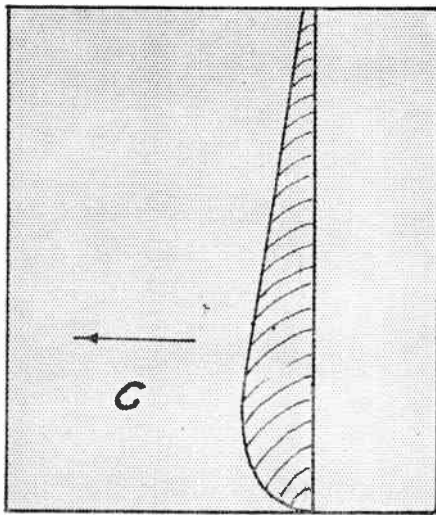
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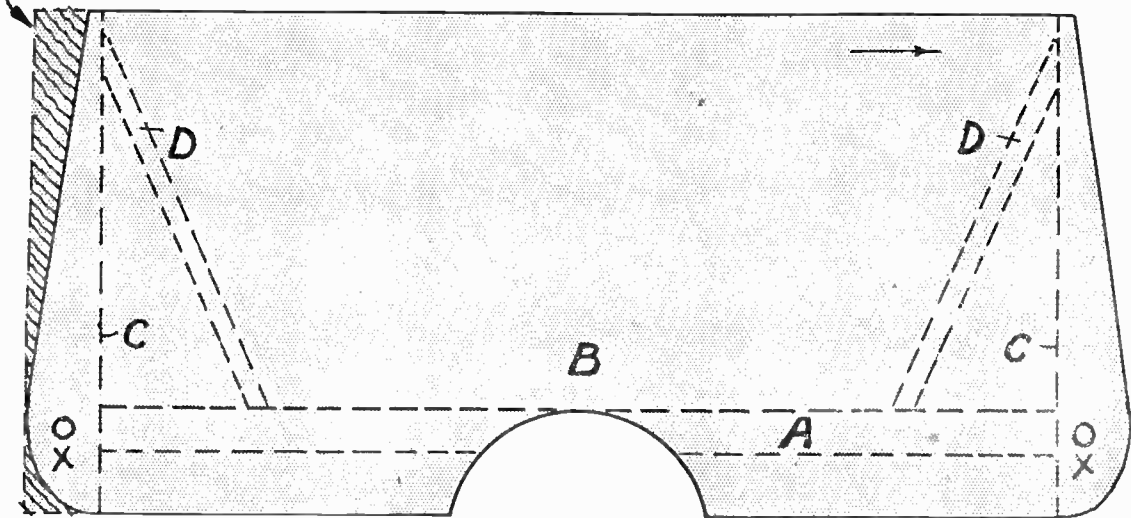
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