HOBBIES WEEKLY

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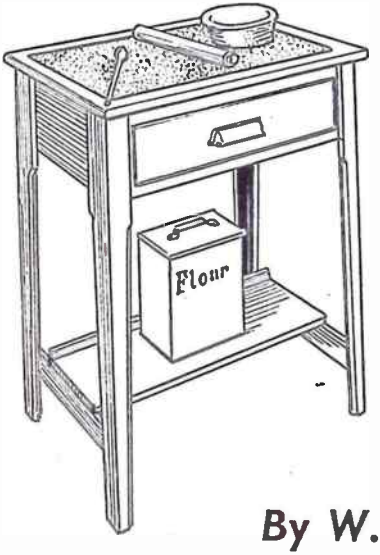
IN THIS ISSUE

Detailed instructions for making a

PASTRY TABLE



By W. J. Ellson

UNLESS the reader owns one of the modern kitchen cabinets, complete with pastry board, etc., this special pastry table should prove a useful article in the kitchen. It has a reversible top, which in ordinary use will serve for any purpose, but on reversing, provides a pastry board when pastry or puddings are on the menu. A drawer is added to hold a rolling-pin, mixing spoon, and other necessary implements for preparing food. A shelf below can support a flour bin and anything else, of course.

Not Difficult

A simplified method of construction is given to enable even the tyro in woodwork to make the article satisfactorily with reasonable attention to detail. A side view of the table is given in Fig. 1 with suitable dimensions. Make a start with the upper portion, drawn in Fig. 2. This is constructed by nailing together the two sides to a back piece, and fixing across at the front two bars (A) 2ins. wide. All parts are of ¾in. wood. Note how the bars are rebated at their ends to fit over the sides. It is important to take pains in getting this upper part quite square at the corners, or trouble may ensue in working the drawer in and out. Glue and nails will serve for jointing, as the corners will afterwards be hidden by the legs.

Inside, nail a drawer runner to each side piece, also of ¾in. wood, and lettered (B) in the diagram. Get the top surfaces of these quite level with that of the lower cross-bar, so as to offer no obstruction to the free passage of the drawer. Set a gauge to ¼in. and run it round the top edges of the job, as shown by the dotted lines in the drawing. To this gauged line a frame of ¾in. wood, 1¾ins. wide, is nailed and glued, with neatly mitred corners, as at (C). This, of course, extends all round, and in the rebates formed by the inner edges of the frame and top edges of the table, the reversible top of the table will subsequently rest. Clean up the work, and slightly round off the outer edges of the frame.

Making the Drawer

The drawer is shown in Fig. 3, the sides and back being of ½in. wood, and the front of ¾in. wood. Note how the front has its ends rebated to allow the sides of the drawer to fit in flush and be invisible. This is a much simpler method of drawer construction, entailing no dovetails, and quite good enough for an article of kitchen furniture. A groove is chiselled out of the sides, at ¾in. up from the bottom edges, to receive a plywood panel which forms the bottom of the drawer. The back of the drawer comes down only to this groove, and the plywood is nailed to it and also to a wood slip (D) glued to the front of the drawer. The dimensions of the drawer must, of course, suit the drawer opening,

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

For Modellers, Fretworkers and Home Craftsmen

4D

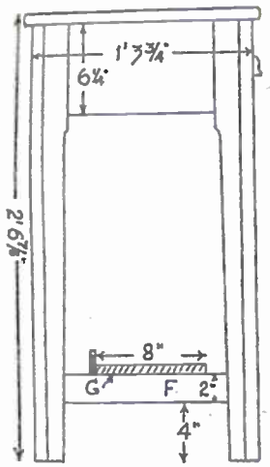


Fig. 1

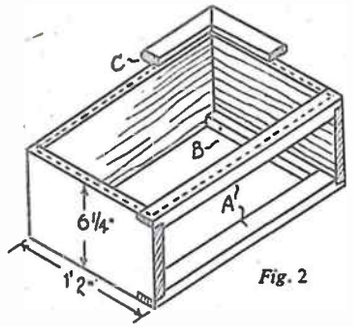


Fig. 2

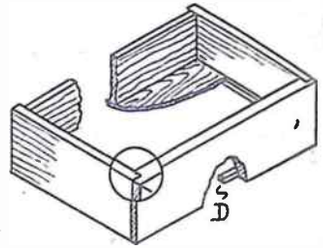


Fig. 3

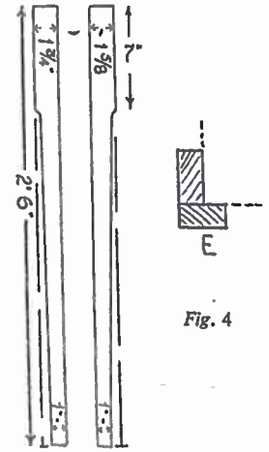


Fig. 4

so they need not be given. It is a good plan here to make the drawer wide enough to extend beyond the front of the table about ¼in. and to bevel the edges. It makes a neat finish to such a plain piece of woodwork.

Chamfer Legs

The legs (Fig. 4) are each made up of two lengths of ¾in. wood, of widths given, nailed and glued together to make L-shaped members, as at (E). At the distance down from the tops, given in the drawing, cut a ¼in. deep notch, and from there reduce the width of each leg part to 1in. at the bottom. These sloped portions can well be chamfered off, to improve the appearances of the job. Now screw or nail the legs to each corner of the table. Make strong joints here.

Between the legs, at each end, nail cross-bars of ¼in. wood, as at (F) in Fig. 1. These are 2ins. wide. The ends of these cross-bars will have to be bevelled off a little, or they will show from the front, as will be seen when fitting them in place. To the bars a shelf (G) is screwed across, of ¾in. wood. Add a strip of thin wood, 1¼ins. wide, to the back edge of the shelf to help prevent articles placed upon it falling over backwards. Punch the nail heads well down, and stop up the holes. Glass-paper the sides of the drawer to ensure easy running, and to the front of the drawer fit a brass 'pull'.

Cover with Plastic

For the reversible table-top, it is suggested you obtain a piece of stout plywood, and cover one side of it with a suitable plastic material for rolling pastry on. Formica might well suit for this, and readers may know of other substances equally suitable. The thickness of the wood should, with the addition of the plastic, equal the thickness of the frame in which the top will rest. If it will be more convenient, the wood used for the frame can be ¾in. or ¼in., as long as both top and frame finish level.

The completed table could be left in the plain wood, but if preferred painted, a white enamel might be considered as most suitable.

● Continued from page 324

Pocket-size Draught-Board

proceed to set out the squares with sides of ¾in. after setting in a margin of ⅛in. all round as seen in Fig. 3. A white wood, such as white holly or sycamore, should be chosen, so that the greatest contrast is obtained when the dark squares are painted in.

After ruling in the squares in pencil, go over the lines with the tip of a pocket knife, pressing in lightly to form slight cuts. Now rub in a wax preparation all over the boards, so that it sinks into the cuts. Next rub the surfaces clean of the wax, some of which will, of course, be left in the knife-cuts. Use Indian ink for painting in the black squares, the ink being prevented from spreading on to the white squares by the wax cuttings. If Indian ink is not available, then an ebony or a walnut stain will serve the purpose. Successive coatings of the stain may be needed to get the full depth.

Strengthening Corners

If the boards are to have the peg holes made as suggested, these can be done now before the two boards are laid in place and glued on the backing boards. Now, should the corners of the frames need strengthening, small wood keys may be inserted as shown in Fig. 4. The joints are simply made by making sloping sawcuts and inserting thin pieces of wood which have been smeared with glue. Allow the latter to harden before cutting away the waste wood with a knife or chisel. Finally, glasspaper all the framing woodwork and fix the hinges as shown. Add two brass round-beaded screws and two brass hooks to hold the trays well together when the box is not in use. A stain may be used to cover the box and a wax finish would add to its appearance.

The draughtsmen can be made from ¾in. diameter dowelling (beech for preference) cut off in ¼in. widths with the fretsaw. If a small mitre box is available, then the discs would, perhaps, be more accurately cut with this and a small-tooth tenon saw. Pegs of hard wood can be glued in the centre of the discs after they are cleaned up and half their number stained or painted black.

(S.W.C.)

A Bedstead for a Child

A YOUNG baby, in no time at all it seems, soon outgrows its cot, and before they know where they are, the parents are faced with the problem of providing a bed for the growing child. Size and expense have to be considered, because it is obvious that ultimately a full-size bed will be needed. In the interim period a cheap medium-size bed is the answer, and father will probably find that to make one is by far the best solution.

Here, then, is a little bed that has stood the test of time. It was made during the war years, and today is occupied by a ten-year-old boy. On occasion it has been used by an adult. So it is very serviceable.

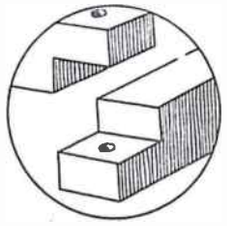


Fig. 2

Inexpensive

It needs little material—a cheaper bed could probably not be found—and hardly any skill is required in its construction. Moreover, when complete with mattress and covers it presents a good appearance and will easily pass for a bought one.

First make the frame on which the mattress lies. This is of 1¼ins. by 1¼ins. sectioned soft wood. A hard wood such as oak may be preferred by some but soft wood was found to be adequate. The length (which may be shortened or increased to suit yourself) is 59ins., while the width is 30ins. These are joined by simple half-lap joints as seen in the exploded drawing of Fig. 2. Holes are bored with a drill to accommodate brass screws, and these, together with glue, will make a good firm joint.

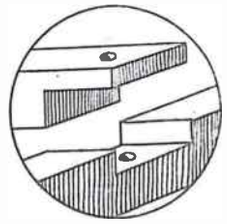


Fig. 3

The frame is further strengthened, and prevented from going askew, by the insertion of corner braces made from the same sectioned sparring. These, again, are connected by means of halved joining. The trench (and lap tongue) need only be ¼in. deep. Screws and glue again are used to secure. A brace is needed at each corner, and the angle is 45°. The joint starts 10½ins. from the corner. (See Figs. 2 and 3.) The frame, thus made, will be quite strong and rigid, despite being quite light in weight.

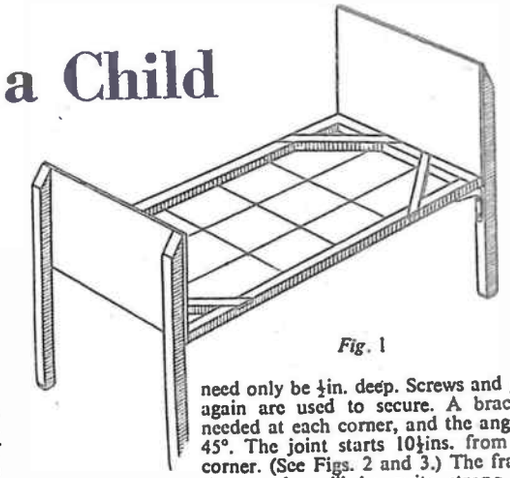


Fig. 1

Filling the Frame

Now follows the job of filling the frame. Special webbing can be bought nowadays which is strong and elastic,

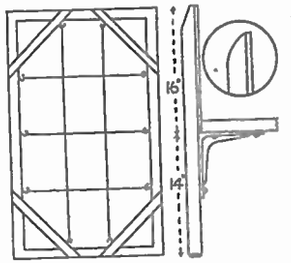


Fig. 4 Fig. 5

and all one need do is nail it at intervals across the frame and again in the rectangular direction. However, when this bed was made, such webbing was not obtainable. So the following method was adopted: Screw eyes (or hooks) are screwed into the insides of the frame, and 20-gauge galvanised iron wire strung from side to side, as in the illustration (Fig. 4). Where the wires cross, finer wire is used to tie them together.

Over this was put wire-netting of 1in. mesh. This was fixed with small staples driven into the top of the frame. To cover the ragged edge of the netting a piece of thin stripwood was nailed along. This should preferably be rounded, or at least chamfered. Care should be taken, when fixing the netting, to keep it stretched taut. In use, the netting will sag, but the wires

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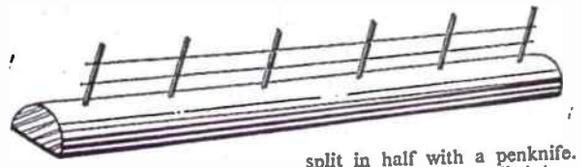
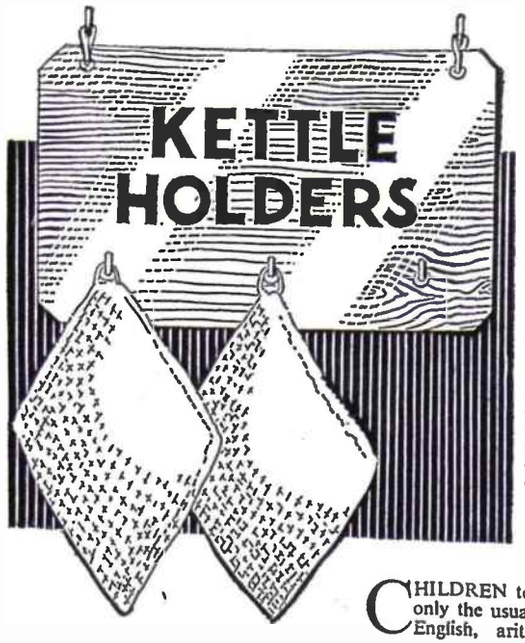
Making Model Fencing



HERE is an idea for making model fencing to suit railway layouts, farms, etc. During country walks, collect lengths of fairly straight sticks, approximately 12ins. long and ¾in. diameter. Straight grained wood, such as ash is preferred, for these sticks are then split in half with a penknife. Painted green, they become reallstic 'grassy bank' bases, split side down.

Panel pins are spaced along as posts, but not hammered in too near the ends for fear of splitting. Thin wire is wound round these to complete the fence. Pins and wire are then painted white

(R.H.W.)



Make This for the Kitchen

A full-size pattern is on page 335

CHILDREN today are taught not only the usual school subjects of English, arithmetic, geography, history, etc., but also how to make things with their hands. Needlework, raffia work, basket making and woodwork are all in the curriculum. The woollen kettle-holder, for instance, is a favourite with the younger children.

Let the children make three kettle-holders of different colours. They can be hung on this attractive rack and will always be within reach.

Trace the pattern, which is full size, on to a piece of ¼in. wood. Drill each letter and cut out with a fretsaw. Clean up with glasspaper and apply two or three coats of plastic enamel paint. Tie two small loops of coloured string through the holes at the top and screw three dresser hooks in place as shown.

The edges of the letters should be painted black to make them stand out clearly. Glue a piece of leathercloth or thin card behind the letters and stick the centre of the letters O, D and R in place. (M.p.)

A Pocket-size Draught-Board

Fig. 1

HERE is a miniature draught-board which can be used in the ordinary way for play at home, or it can be brought into use when travelling by sea or rail.

It is really a pocket-size board made to fold in the middle to form a box for holding the draughtsmen. (See Fig. 1.) When open the box will appear as Fig. 2, and if desired each draughtsman can be fitted with a tiny wood peg in the centre, this peg fitting into a corresponding hole in the centre of each square on the board. Thus the players have no need to fear their 'men' sliding away out of place. When closed, the box measures 6½ins. long by 3¼ins. wide by 1in. deep.

In making the box first cut two pieces of ¼in. thick wood to the above size. To each of these pieces glue four strips of plain square wood all mitred at the ends

Fig. 2

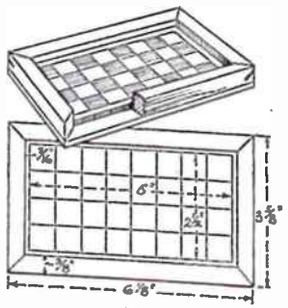


Fig. 3

to an angle of 45 degrees to join up like a frame. (See the two diagrams in Fig. 3.) In the top diagram a portion of the front strip is broken away to indicate the placing of the four pieces and the interior floor piece upon which the squares will be drawn. The mitres must be carefully cut and the fretsaw will be found useful for this, or a fine-tooth tenon saw may be used to advantage. Glue the eight pieces to the ¼in. backing, and put both trays under weight for several hours until the glue has hardened.

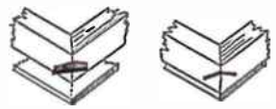


Fig. 4

Check Carefully

Next prepare the squared playing boards. These will be dropped into place between the raised edges of the trays and glued firmly to the floors. Check the measurements very carefully between the frame edges. These measurements should be about 5⅛ins. by 2⅜ins. Cut two pieces of ¼in. wood to fit exactly into the opening, as suggested, then

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Tougher Plaster

I MAKE a lot of castings from rubber moulds, using the plaster sold by handicraft shops. As this is easily broken, I would like to use something better. Can you suggest any formula for plaster? (P.R.—Nottingham.)

PLASTER can be made tougher by dissolving 3 per cent of gelatine in the water used to prepare the casting mass. Such a composition sets more slowly than a straight plaster-water mixture. A very strong cast is obtained by mixing calcined magnesite to mortar consistency with a solution of 4 parts of magnesium chloride in 6 parts of water—parts are by weight. This takes a sharp cast, but needs about thirty hours to set hard. A stone-hard cast can be made by mixing equal weights of Portland cement and silica flour to mortar consistency with water.

* * *

Hardening Iron and Steel

KINDLY tell me how to harden steel and iron; also how to temper it. (V.M.—Castlebellingham.)

IRON and steel are usually hardened by bringing to red heat, then quenching immediately in oil or water. Other methods to give very hard surfaces also exist, one making use of flux materials. The makers of Fluxite, a well-known soldering flux, have issued details for case-hardening metals with Fluxite, and it is suggested you study these, which should be available from any stockist. If not, you could write direct to the makers.

* * *

Useful Formulas

I WOULD be obliged if you could give me a formula for a chromium polish or cleaner, and also one for a photographic glazing solution for contact prints. (B.P.—Tooting.)

A GOOD chromium polish can be made by dissolving 16 grams of bar soap shavings in 160 c.c. of boiling soft water, removing from the source of heat and stirring in 32 grams of precipitated chalk. Allow to cool and add 5 c.c. of clear household ammonia. Shake before use. For a glazing solution for the prints, dissolve enough light gelatine in hot water to produce a very thin syrupy liquid and brush on hot. A cold solution may be made by dissolving scrap celluloid in amyl acetate by leaving aside in a closed bottle and shaking occasionally. This should be thinned to a similar consistency as the gelatine and may be sprayed—in the open air, for the vapour is inflammable and also upsets some people's stomachs a little. Another spraying solution can be produced by thinning down Durofix with amyl acetate.

* * *

Paint for Outside Woodwork

PLEASE supply me with the quantities and ingredients for making paint for outside woodwork. I require a few gallons and am unable to pay the shop price. (J.P.—Aberdeen.)

YOU do not state the colour of paint you want, but we assume it will probably be one of the lighter shades. For a good exterior paint, the base should be white lead and raw linseed oil and coloured to shade with pigments bought from an oil and colour shop. Take 56lbs. white lead (dry) and grind in roughly 1 gallon of raw linseed oil. Work in pigment and strain. As white lead is expensive at present, you could cheapen your paint by substituting up to 50 per cent of the white lead with either ground barytes, silica flour or china clay. Any thinning required should be done with raw linseed oil. If pure white is desired, add enough blue pigment to the white lead/linseed oil base to counteract any tendency to yellowing from the oil.

* * *

Heating a Pig-sty

CAN you instruct me how to warm the floor of a pig-sty by electricity? (V.M.—Co. Louth.)

GENERAL practice is to employ suspended heaters in pig houses, with earth, board, or other warm flooring covered with an ample thickness of straw. Such heaters may be purchased, and resemble radiant electric fires of rather low temperature, with chains or other means of suspension. If, however, the floors are to be warmed, the treatment would depend upon the type of floor. The electrical elements would have to be underneath a moisture-proof surface, for protection, and this arrangement would appear rather difficult, especially as the floor would have to be fairly thin to allow conduction of heat, yet be able to withstand any weight upon it. It is recommended that you consider some of the approved methods which are covered in farming periodicals such as *The Farmer and Stockbreeder* or *Farmer's Weekly*.

* * *

Keeping Foreign Birds

IS it at all possible for me to keep and rear humming-birds without the aid of expensive equipment or foods? I should be glad of information regarding books on this subject. (J.B.—Hull.)

YOU would find it hard to keep humming-birds in captivity and to breed the species, and they are seldom seen in this country outside a zoo. They would, in any case, be expensive. Many other tropical birds are very attractive, however, and if you are interested in such, we suggest you consult your nearest pet shop proprietor as to the best kinds to try your luck with—such charming little birds as the fire finches, for instance. Or you might obtain a copy of *Foreign Birds for Beginners*, by D. H. S. Risdon, which gives information on 150 species, and contains coloured plates of over fifty kinds. Price of the book is 11/-, post free, from 'Cage Birds', Dorset House, Stamford St., London, S.E.1. A much cheaper booklet can be obtained from pet stores or from Frank Ditchfield, Pet Book Publisher, 161 Morrison St., Edinburgh, price 6d. (plus postage if ordered direct). This little book on *Foreign Birds* gives particulars of fifty varieties, and will give you some idea of whether you would care to take up the hobby.

* * *

Painting the Kitchen

I AM about to repaint the kitchen, the present paintwork of which has been badly affected by steam. I would be pleased if you could tell me the best way to prepare the surface for repainting, and the best paint to use. (J.E.—Harrogate.)

THERE may not be any necessity for removing the old paint, but it should be cleaned down at least, and, if the surface is ruffled, rubbed down with pumice stone and water. Dry the wall, then a coat of Brolac, a steam-resisting paint, could be applied. If the wall is damp, it would be safer to paint with Macstet, obtainable from Devon Commercial Arts, Church Lane, Barnstaple.

A FASCINATING HOBBY

Art Craft with Coconuts

Fig. 1

ACTIVITY in arts and crafts is undergoing a renaissance in Britain today. Many thousands of people are finding happiness in creating things with their own hands. To most of them it is a hobby, but amongst the native peoples of lands across the sea it is the very fibre of life. Art and life are one.

From American Indians, Africans, Asiatics, and many other races, we can learn much. Not the least is the fact that common materials of life, which to some would appear worthless, can be converted, by the skill of man, into objects of value. The extent to which this can be carried proves a continual source of wonder.

Few pause to think, as they throw away the shell of the ordinary coconut, that here is the raw material for creating objects of use and decorative value for the house. The next time you get coconuts in the house, sit down and consider the possibilities inherent in them. To help spur the imagination, we give a few suggestions. Obviously, it is advantageous to refrain from breaking the shell until you have considered the craft possibilities.

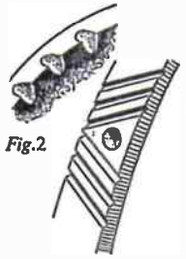


*Fig.*2

Fig. 3

Fig. 4

The first example shown (Fig. 1) may well be appreciated by those wanting some decorative objects for the sideboard or mantelpiece. Two of these, placed one at each end, could be quite effective. They will, no doubt, become receptacles for odds and ends, such as pins, buttons and postage stamps, but they would hold small fruit, for example a small bunch of grapes.

Remove Fibre

First remove all rough fibre from the coconut. Scraping with a penknife will be sufficient. Next, with a pencil

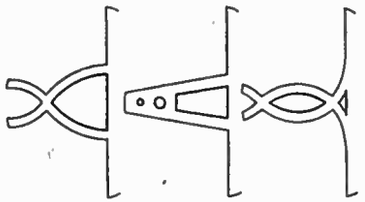


Fig. 5

draw the required lines on the shell to indicate the position of the top of the bowl and the handle. These, of course, are at right angles to each other. The handle should be a ½in. or more in width.

The shell can then be sawn to produce the basic shape. It will help if a vice large enough to hold the coconut is available. Otherwise, just hold the nut with hand and knees while sawing. After sawing, remove all the white meat of the nut with a knife.

Next, draw the arc shapes round the lip of the bowl. Take care with these, ensuring that they are evenly shaped. Care will be needed at one end if you have sawn through the 'eyes' of the coconut. The gap or gaps left in the lip of the bowl due to this might be troublesome. It is better to avoid cutting through them in the first place, if possible. In drawing the arcs it is best to draw those at the base of the handle and work round from these.

The arcs can then be cut out. A small saw will be successful for some parts, but others will have to be done with a file, such as the Abrafile. Clean up with a flat or three-cornered file. The lip is decorated eventually with indentations of a toothed character, but leave this until later.

Working the Design

In the meantime, the decoration round the sides of the bowl can be done. For this you will need first a hand drill, and with this the holes or 'dots' of the simple decorative design are bored. The stalks or leaves must first be started by boring a hole. Some of these can be completed with a fretsaw, but a very thin file is recommended. Naturally, the patterns should be drawn first.

The next task is to clean up the whole shell—inside and outside of the bowl and the handle. Glasspaper will do this, finishing off with the finest grade to make the bowl as smooth as possible. The lip of the bowl is then 'toothed' by the use of a round file of the necessary thickness. Incidentally, the tooth is put on the inside edge of the lip. The effect of putting it on the outside edge can be tried.

The handle is decorated with a zigzag composed of three cuts alternating in direction. These are made with a three-cornered file or fine saw blade. In the triangles formed, a conical hole is made by boring with the point of a drill. The illustrations in Figs. 1, 2, 3 and 4 make all the foregoing clear.

Choose Your Finish

The finishing is a matter of choice. The plain coconut, waxed or varnished, may be preferred. Others may try staining. In any case, the peculiar veining and speckling of the shell is distinctive and attractive.

Left as it is the bowl would rock on its rounded bottom. To prevent this, four feet can be devised of wood (or ready-made rubber feet could be used). These can be screwed or stuck on to the bowl. Another way is merely to flatten the bottom with a file or glasspaper wrapped over a wood block.

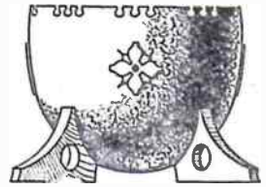


Fig. 6

Fig. 7

The ingenious will readily perceive variations of the design treated here. The handle alone is capable of much elaboration. In Fig. 5 will be seen alternative shapes for the handle. In Fig. 6 another design is shown which will appeal to those who love flowers (although it could be used for purposes other than this). The coconut is sawn in two across its waist and the larger and rounder piece used to make a delightful little bowl, whether for flowers such as anemones, pansies, primulas, etc., or even for sugar.

The lip is decorated with the design seen enlarged in Fig. 7. Holes are first bored all round with a drill, and then the lip is filed down to each hole. It will be seen that the holes are grouped, the untouched portions providing pleasant relief from the monotony that might result from having holes one after the other, without a break. The bowl is stabilised by shapes cut from a batten of wood. These should fit the rounded form of the bowl, and can be stuck on. For decorative purposes, a hole is bored through the centre of each.

The four florets which decorate the sides of the bowl are shaped from pieces of coconut shell (or they could be wood) with a hole drilled in the centre. They are glued on to the bowl. Properly finished, with a fine surface, this bowl can meet many needs. Several of them in a line, loaded with flowers, and placed along the window ledge, would be most impressive. (A.F.)

HANDLING AND USE OF WOODWORK TOOLS

The Marking-Gauge

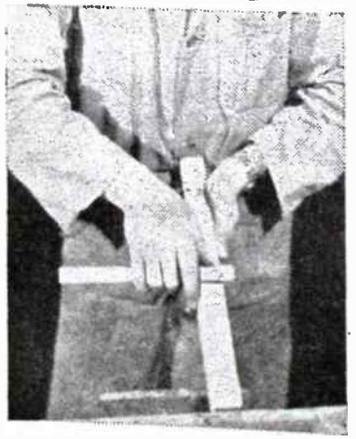
THE marking-gauge is used for marking a line parallel to a side or edge *which is known to be true.* It therefore ollows that the stock (the sliding part) must always be pressed against the face-side or face-edge of the wood, since these have been planed true and square to each other.

You will find it easier to manipulate if the point projects at least ⅛in.

The photograph shows the way it is held. The stock must always be in close contact with the face-side or face-edge. The point drags behind as the gauge is pushed slowly and firmly away from the body. The wood rests against a convenient stop, but it must be lifted to mark the last inch or so.

The point may try to follow the grain, causing the stock to be forced away from the wood. This must be resisted.

It is not necessary to make a deep cut: a shallow mark is sufficient. If any difficulty is experienced, it is a good idea to hold the wood in the vice by one end, sloping upwards, and to assist the gauge



on a straight course by holding the end of the stem between the thumb and forefinger of the left hand. (K.B.)

● Continued from page 323

Child's Bedstead

strained beneath it will prevent any further movement.

The bed ends should now be made. These consist merely of two legs each, joined by plyboard ¼in. thick. The top or head of the bed requires plywood measuring 30ins. by 16ins. This should be cut squarely, and is fixed by screws (countersunk) to the top of the two legs. The legs are of 1¼ins. by 1¼ins. section and are 30ins. long. The top of each is chamfered to improve appearance (but this can be rounded gradually, as in the inset). The bottoms are chamfered as well, on each of the four sides (Fig. 5).

STICKING DOWN PATTERNS

USUALLY we recommend tracing patterns of design sheets, etc., but if patterns have to be stuck on to wood as a guide to cutting out, attach them with rubber gum as the adhesive. Spread the rubber gum evenly over the back of the pattern, lay in place over the wood and smooth down absolutely flat. When you have finished cutting out you will find that you can peel the pattern off again (and save it for further use, if you like). Any gum remaining on the wood can be rubbed off. There is no need to scrape or wash patterns off, using rubber gum adhesive. (R.H.W.)

The bottom end of the bed is treated similarly, only it is much lower in height. Here the plywood is 30ins. by 10ins., and the leg height 24ins.

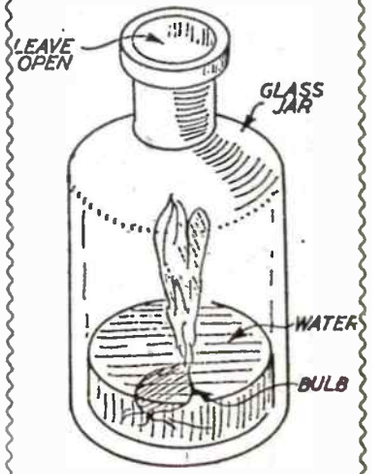
The frame of the bed is connected to the bed ends by angle brackets or plates. These should be at least 6ins. long in the arm—the bigger the better. They are attached by screws, as can be seen in Fig. 5. The bottom edge of the plyboard head can be screwed (countersunk) into the end of the frame. The bottom of the bed will be found to be 14ins. from the ground.

Enamel Recommended

The bed is now completed, save for finishing. The constructor may wish to stain and polish, but in this case two or three coats of cream enamel were applied with happy results, and is recommended.

When the paint was thoroughly dry, the bed was completed by sticking nursery rhyme subjects on the top of the bed. Transfers for these and many other subjects are always available cheaply. As an alternative coloured pictures can be cut from books and stuck on. The bright reds and blues, etc., of such subjects seen against the cream background are quite cheering and will certainly delight the children. (A.F.)

Bottled Flowers!



BULBS, such as crocuses, will grow readily, and flower, if kept in a clear glass bottle or jar, uncorked, and with just sufficient water to cover the bulb. They will flower more rapidly than potted bulbs, especially if kept in a sunny position. Then you can puzzle your friends as to how a full-grown plant got inside the bottle! (R.H.W.)

Making Variable Condensers

By A. Fraser

VARIABLE condensers bought in the shops today are precision engineering jobs. One can well understand this when it is appreciated that the air gap between the plates in an average condenser is in the region of a hundredth-of-an-inch and can be less. Those readers who have engineer's equipment may attempt to copy the factory-made object, but this will be out of the question for the ordinary hobbyist.

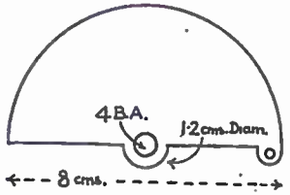


Fig. 1

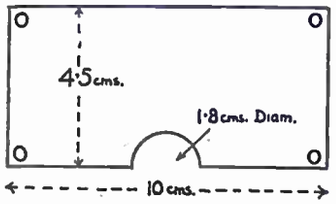


Fig. 3

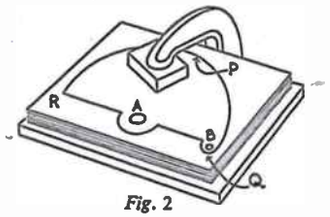


Fig. 2

This article, therefore, is written especially for those with the minimum equipment. It will be seen that, without much difficulty, condensers can be made whose performance is quite good, and which will give satisfactory service to the average radio constructor. A bought two-gang condenser can cost up to £1, but one can be made at home for a few pence. Moreover, making one's own components is a pleasant experience, and to operate a set with them gives a well-merited sense of achievement.

The construction of a two-gang is described at the start, for once this is known, the making of a single gang, or three- or four-gang, is easily understood.

Avoid Thin Sheets

The first essential is some aluminium or aluminium alloy sheeting from which to cut the vanes of the condenser. Gauge 22 is suitable, but thicker or thinner could be used. Only avoid very thin sheet which might bend, for vanes must be rigid. Needless to say, the metal sheeting should be perfectly flat and free from dints.

The cutting out of the vanes is best accomplished by clamping several sheets of metal together and sawing out the particular shape required with a fret-saw, using a metal-cutting blade. In this way, several vanes are produced at once—the number depending on the thickness of the sheets and the number you can manage. The top sheet should

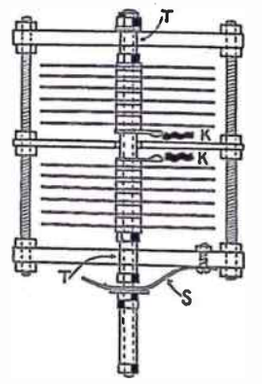


Fig. 4

have the shape of the vane drawn on it directly with ruler, compass and point. The shape and dimensions of a simple vane are shown in Fig. 1.

Place the metal sheets on a piece of flat board and clamp all together with a cramp, or even a vice. To avoid damaging the top sheet, put a piece of wood under the foot of the cramp. (See Fig. 2.) Now bore holes (A) and (B) with a hand-drill. In this case, (A) was 4 B.A. and (B) was 8 B.A. Bolts are then passed through and nutted—thus helping to clamp the sheets more securely. The shape is then cut out with the fretsaw. First, start at corner (Q), and saw round to point (P), where the clamp prevents further progress. Return to (Q), and saw along the bottom to corner (R); then round the curve. When the saw comes to the cramp, remove this latter and shift it further along. Then continue cutting up to point (P). The vanes are now completely cut out, and cramp and bolts may be removed. Before doing this, you may wish to clean up the edges with a file.

Twenty-two plates are needed for the moving vanes of this two-gang condenser. The fixed vanes number twenty and are shaped as in Fig. 3. These may be sawn out, for the most part, with a hacksaw. Bore all holes first.

Spacers for Vanes

Some 4 B.A. and 8 B.A. screwed brass rod (studding) is now needed, or similar thicknesses will do. Appropriate washers are also needed to act as spacers for the vanes. These should be of brass, copper, aluminium or cadmium coated steel. Half of these should be ·05in. thick and the other half ·02in. thick. They should not be more than ⅛in. in diameter.

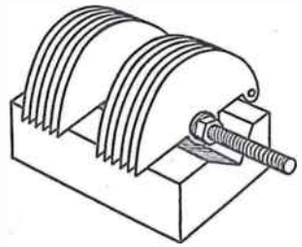


Fig. 5

The assembly of the rotor (or moving vane part) can now be undertaken. First turn on a nut the requisite distance from the end of the screwed rod. From the other end slip on one ·02in. washer. Then slip on a metal vane (Fig. 1 shape). Through the hole at the corner of the vane pass the 8 B.A. studding. (This should also have a nut a little distance from its end.)

Now slip on a ·05in. and a ·02in. washer over the 4 B.A. rod, and the same over the 8 B.A. Then another vane is put on. Again another lot of washers is put on, and then again another vane. Proceed in this manner until eleven vanes have been put on (Fig. 4). Then over the 4 B.A. rod place a ·05in. washer and a soldering tag to which has been soldered a 3ins. length of flex (sometimes referred to as a 'pig-tail') which will be the earthing connection to the moving vanes (K,K, Fig. 4). More washers (or a piece of brass tubing) follow, and if preferred, another 'pigtail'. The second lot of vanes for the second gang can then be put on. It is understood that washers are added to the corner 8 B.A. screwed rod, to keep in step with those on the 4 B.A. There are, of course, no 'pig-tails' in this case, and there need be no

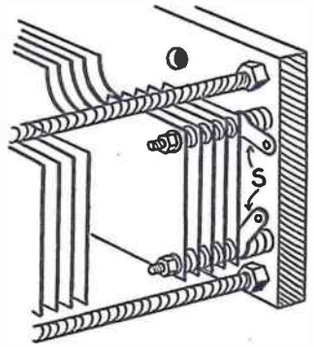


Fig. 6

spacers between each gang—a nut on either side can suffice, if washers are scarce.

Rigid Structure

When the last of the vanes is placed in position, slip on another ·02in. washer and a nut over both 4 and 8 B.A. rods (Fig. 4). The nuts at each end of the rotor have now to be tightened to make it a permanent, rigid structure with all the vanes in line. This can be done while holding the vanes down on a block of wood in which has been sawn a vee-shaped channel for the axle of the rotor to occupy but not touch. Only the vanes touch the block. Fig. 5 explains this.

Properly done, this should result in a rotor in which the blades are perfectly in line and equally spaced from each other from end to end. This is very important, and the constructor should carefully examine his work to see that this is so. Bent and imperfect washers are the trouble-makers, so look out for them. If all washers are perfect and some blades are still askew, then the only thing to do is bend them carefully into place. But be careful not to upset the alignment of the other vanes in the process. It will be appreciated that the screwed rod (8 B.A.) at the corner (Q) of the vanes will help considerably in keeping the alignment of the vanes true.

Leaving the rotor for the moment, the fixed vanes can be assembled. Each gang is made separately. The spacers are one ·05in. and one ·02in. washers together, as in the rotor. The screwed rod is 8 B.A., or bolts could be used. The long ends of these have soldering tags attached for connection to the set circuit. Fig. 6 shows this (S).

Frame Assembly

The next job is to make the frame which holds the vane assemblies. This should be, preferably, of ¼in. paxolin, but plywood will do if it is dry and varnished with insulating material. A front and back of this will be needed, of the shape and size as in Fig. 7. Two pieces should be clamped together and

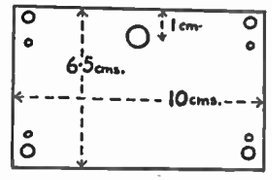


Fig. 7

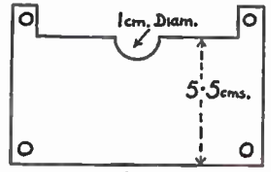


Fig. 8

the holes bored straight through both pieces, to obtain perfect similarity of both back and front frame.

The middle wall of the frame should be thick aluminium, also serving to help to keep the frame rigid. The three walls of the frame are held together with screwed rod (or bolts) and nuts. But a base and sides attached with bolts or screws will make an even better job. The middle wall is shaped as in Fig. 8

In assembling the complete condenser, pieces of metal tubing (or even hard ebonite) are fitted tightly over each end of the rotor to provide a proper spindle for the bearing (T, in Fig. 4). The front and back and middle frames are then attached and fixed with the screwed rods or bolts. At the back, the rotor spindle end is provided with a couple of washers and locked with two nuts, and, if necessary, hammered carefully to rivet the fixture.

The Brass Spring

As will be seen in Fig. 4, the front end of the rotor is controlled by a brass spring (made out of springy ⅛in. brass strip). This is (S) in Fig. 4. This has a hole bored in it to allow the spindle to pass through, and it is fixed to the front frame with a small bolt. This spring enables the rotor to stay put at any desired point of rotation. In front of the spring are two thin washers followed by two nuts locked together firmly.

For the control knob, or drive drum, sleeving is placed over the end of the screwed rod and held there by nuts.

The last operation is to attach the fixed vanes. The two sections are fixed one at a time, being held in place by nuts. The number and thickness of the washers between the fixed vanes and the side of the frame is critical, because it affects the spacing of the vanes with those of the rotor. The distance apart of the vanes (the air gap) is slightly over ·02in., so a washer of this thickness can be tried between the blades as a test. It is vitally important that the blades of rotor and stator do not touch each other at any point.

The simple method of construction shown here can be improved on. As an example, the plain journal bearing of the spindle could be a ball-bearing one. Then, again, the simple semi-circular shape, with central bearing, will lead to crowding of stations at one end of the scale. To obviate this, a cam-shaped vane could be made instead, resulting in the stations being more evenly spaced. Still further, the outside vanes may be slotted so that segments can be bent out or in to establish more perfect ganging all along the scale.

Formula to Work On

The reader can make his own size and shape of condenser to suit his own requirements by using the following formula:—

$$C = \frac{\cdot 0885\ NS}{1{,}000{,}000\ d}$$

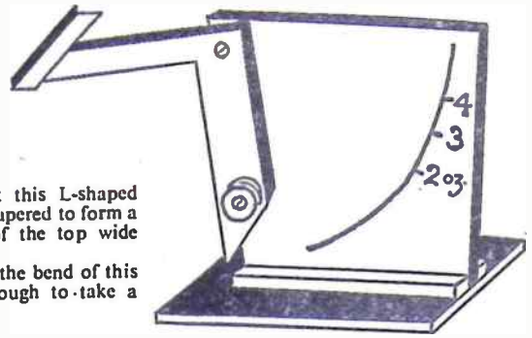
where N is the number of moving vanes, S the area of the moving vane in square centimetres, and d is the air gap in centimetres.

The capacity of each section of the condenser just described is approximately ·0005. With the same method of construction, and using only six moving vanes and five fixed vanes, the capacity would be approximately ·0003. It must not be forgotten however, that in actual practice, accidental capacity charges will increase these figures.

Finally, it may be pointed out that condensers with a wide air gap are easier to build, and so are recommended to the inexperienced.

A HALF-HOUR'S JOB

An Easy-to-Make Letter Balance



WHY guess the weight of letters and risk putting too many stamps on or too few, when a letter balance can be made in half an hour? It is quite simple to construct, and requires little material.

The upright support for the arm is cut from plywood, and measures 5½ins. by 5ins. Mark off 1in. at the bottom left-hand corner, and draw a line to the edge at the top left-hand corner. Cut off this portion. The bottom edge will then measure 4½ins. (Fig. 1).

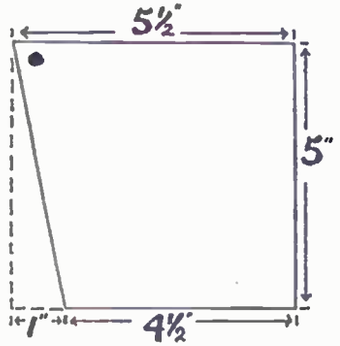


Fig. 1

Nail this support to a wooden base 5½ins. by 2½ins., and ¼in. thick. Strengthen with two ¼in. square side pieces, each 4½ins. long.

For the moving arm a piece of plywood 4½ins. by 4ins. is required. Mark off ½in. at the left side, and 1in. along the top. Then cut out this L-shaped piece, which should be tapered to form a point at the bottom of the top wide portion (Fig. 2).

Now make a hole in the bend of this movable arm large enough to take a

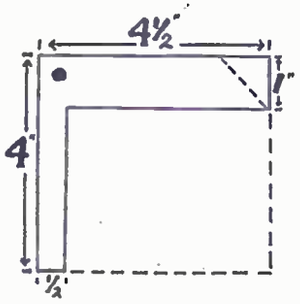


Fig. 2

¼in. bolt. Drill a similar-sized hole in the upright support at the top left-hand corner. Insert the bolt, and secure with a nut. (Care must be taken to ensure that the arm works freely.)

Cut a piece of tin 2ins. by ¼in. and turn up one of the long ends ¼in. to form a ledge. Then place the tin centrally at the bottom of the narrow arm, and nail securely.

The other wide end of the arm must be weighted by means of iron washers screwed on. The total weight of these washers should be approximately 1½ ounces.

The markings can be shown on the right-hand side of the upright support. Place six pennies in an envelope, notice where the pointer stops, and mark '2 oz.' Then put twelve pennies in an envelope, and take the next reading—'4 oz.' (One penny and a half-penny weigh ½ oz.)

COMING ATTRACTION

Next week's issue contains full details for making a grand model power-driven Motor Launch. Make sure of your copy.

A word of warning is necessary—be careful to use coins in good condition, otherwise your markings will be inaccurate.

Two effective contrasting colours for the finish are white for the upper part, and black for the base and markings.

To weigh a letter, place it on the ledge, and support it lightly in a vertical position. (E.G.)

MISCELLANEOUS ADVERTISEMENTS

A USEFUL LABORATORY SIEVE

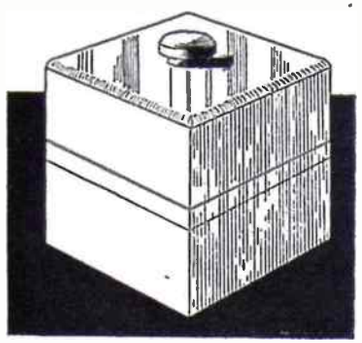


Fig. 1

A SIEVE can be very useful in the laboratory, especially when you are grinding chemicals. A point is reached when the powdered part of the grinding batch begins to slow down the powdering of the remainder by acting

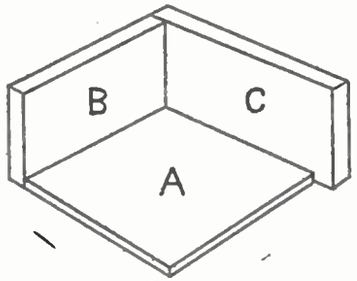


Fig. 2

almost as a lubricant. This can be obviated by sieving off the coarser material and returning it alone to the mortar.

It is an advantage to have a totally enclosed sieve, so as to avoid scattering the powder far and wide. In this way the air is not contaminated with dust which may be injurious if breathed. The sieve shown in Fig. 1 fulfils these requirements. Constructed of well glass-papered wood, it consists of a sieve interlocking into a collecting tray and provided with a lid.

A start is best made with the tray, which is shown in Fig. 2. The floor (A) is of ¼in. wood and should be cut 4ins. square. (B) and (C) are of ¼in. wood and two of each will be needed. (B) is 4ins. by 2¼ins., and (C) 5ins. by 2¼ins. These should be cemented together with balsa cement and a few fret nails for extra strength may be used.

Fig. 3 makes the sieve detail clear. The upper part is of ¼in. wood. Two each of (D) and (E) are needed, (D) being 4ins. by 2ins., and (E) 5ins. by 2ins. A 5in. square of fine brass or copper gauze is held in place under this by the lower section by means of screws. Two (F) and (G) components are cut from ¼in. square stripwood, 4ins. and 5ins. long respectively, and are fitted together with balsa cement and fret

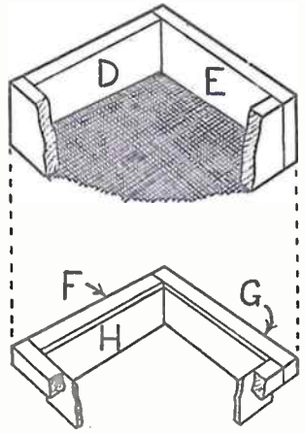


Fig. 3

nails. The four (H) pieces are cut from ¼in. wood, each 4ins. long and mitred together. To prevent lodgment of powder, the top edges must be bevelled. The (H) pieces are balsa-cemented into position. After fixing to the upper section of the sieve the whole will fit flush into the tray.

An exploded view of the lid is shown in Fig. 4. ¼in. fretwood is used throughout. (M) is 4ins. square, (L) 5ins. square, the latter being rounded neatly at all four edges with glasspaper.

(K) is a 1in. diameter circle, and (J) 1¼ins. A countersunk screw and balsa cement make a strong union of (J), (K), (L) and (M). The piece (I) forms a neat cap on the handle top and is 1¼ins. in diameter. This is rounded with glasspaper and balsa-cemented into position. (M), of course, fits snugly into the sieve top.

The whole article can be left in the natural state, but if a finish is desired, only the outside should be treated. Aluminium paint looks well on laboratory ware.

A tip about the use of an enclosed

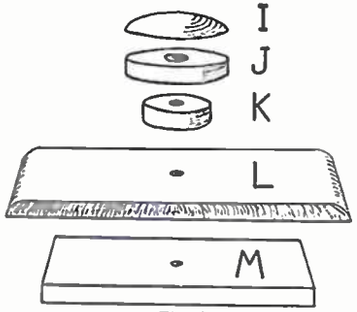


Fig. 4

sieve is never to submit to the tendency to shake it vigorously up and down. This results in slow sieving. The job is completed in a fraction of the time by moving it quite gently backwards and forwards in the horizontal plane. (L.A.F.)

'Photoflux' Capless Flashbulb

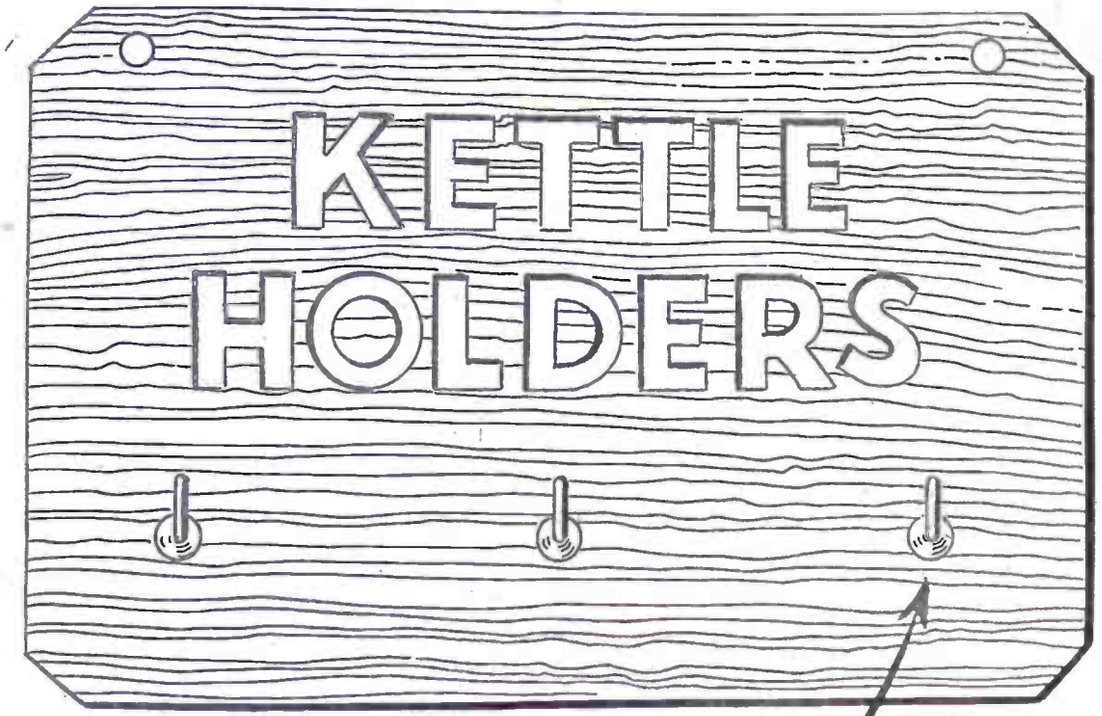
The new Philips 'Photoflux' capless flashbulb, the development of which was announced last July, is now available. This important advance in flash photography technique combines many advantages, including increased power, short effective flash duration and great adaptability. Selling at a list price of 8d. it is supplied in packets of 10 which can be split into two packets of 5. Bulk boxes contain 200 flashbulbs.

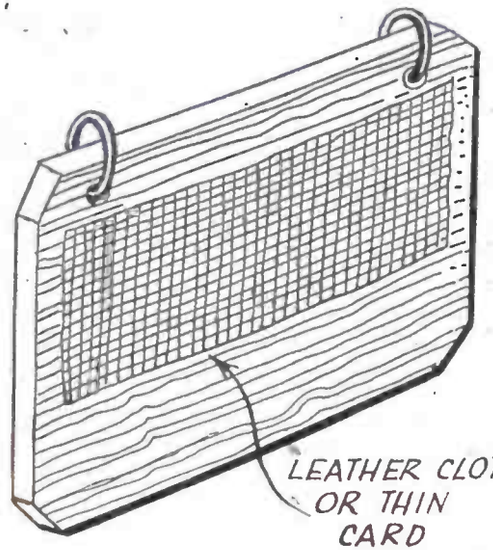
Effective exposures of less than 1/100th of a second are obtainable and action shots with snapshot cameras are thus made possible. The PF.1 reaches peak 18 milli-seconds after contact, so that it can be used on the instantaneous setting with all snapshot cameras and with fully synchronised 'M' shutters on professional equipment.

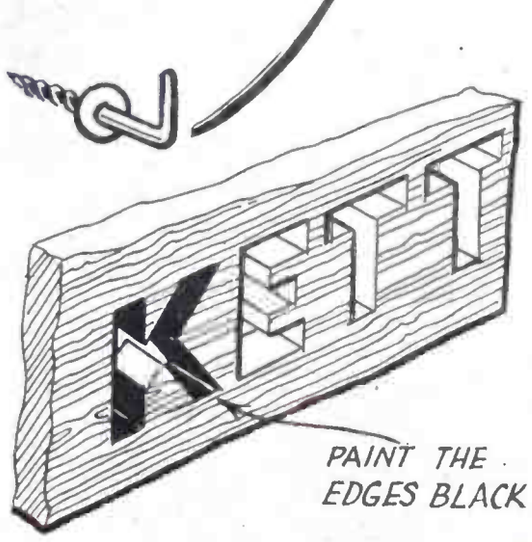
By means of a special adaptor, which incorporates its own ejector mechanism, the PF.1 can be used with any flashgun made to take normal ASCC flashbulbs. The list price of the adaptor is 1/6.

SEE PAGE 324

Pattern for Kettle-Holder Rack







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