Hobbies WEEKLY

CONTENTS

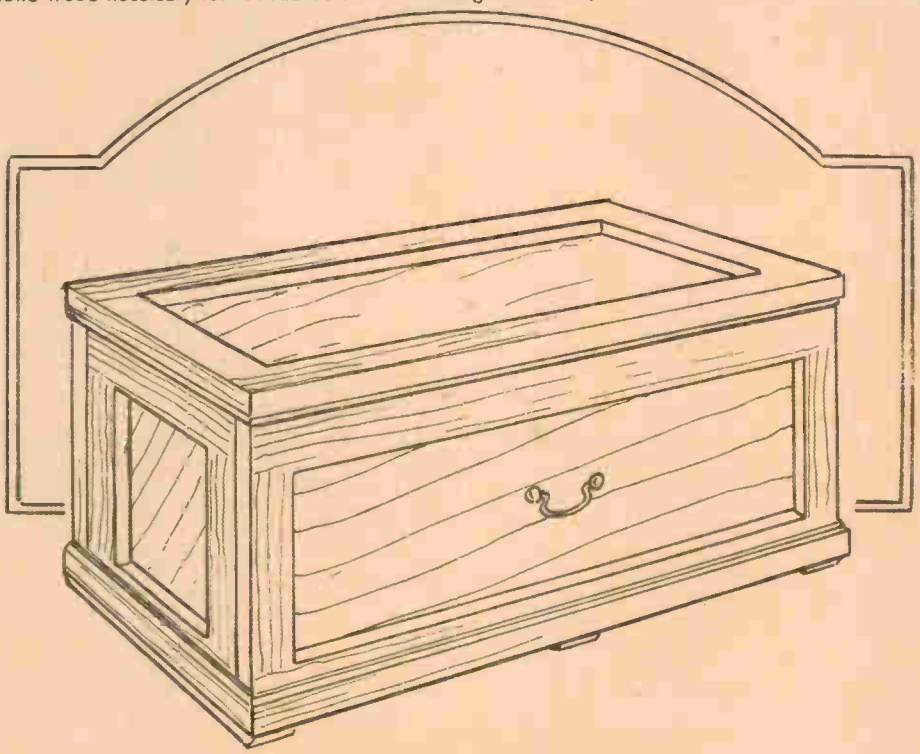
February 7th, 1951 Price Fourpence Vol. III No. 2884

A SIMPLE HOME-MADE

BLANKET CHEST

A VERY necessary and useful article in the home this, for storing bed linen and blankets away when not required in the summer. It is of simplified construction, to present no difficulty to the average woodworker, and the solid wood necessary for it reduced to a minimum by framing the sides and filling in with composition board or plywood.

The dimensions given are the minimum, and if intended for receiving the surplus bedding for two or more beds could, with advantage, be extended in length by another foot. Do not add to the height or width, if for under-bed use.



A front and side view of the box frames are shown in Fig. 1, with suggested dimensions. The timber employed can be deal, ⅞in. thick and 2ins. wide. The corner joints for the long sides are of the simple halved kind, known to all readers. Those employed for the ends are similar, but stopped ½in. away from the ends, as shown in detail (A) Fig. 2, so that no cut ends appear when the frames are joined up. The view of the joints seen at (A) is from the inside, so is not visible to the view, outside.

The Carcase

Glue and nail these joints together, and when the glue is set hard, plane off any unevenness caused by faulty jointing. Then glue and nail the four frames together to make the carcase of the chest. The plywood or composition board is cut in pieces to fit the interior space. Fit the long sides first, then the ends.

Glue should be added to help the board adhere closely to the woodwork everywhere. A rather generous allowance of glue will be required, and the work of nailing down the board expedited as much as possible, as glue soon chills. About the easiest method is to cut and fit one piece of board at a time. Drive

the nails partly in first, then glue the inside of the frame, lay the board on quickly and nail down with all speed.

When the sides and ends are covered, trim off any surplus above the top edges or below the bottom ones, then similarly nail and glue a bottom of the plywood on, to complete this portion of the work. The detail sketch in Fig. 3 will make the above quite clear.

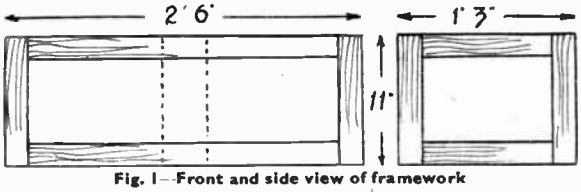


Fig. 1—Front and side view of framework

help to support the bottom of the chest, which, being plywood or composition, cannot be expected to stand much weight of contents without assistance. Glasspaper the runners smooth.

The chest can, of course, be kept anywhere, but really it is intended for keeping beneath the bed, and be out of the way. For the latter reason, it will ensure easier running if roller bearings are fitted to the runners.

These can be, or at least used to be, bought at most hardware stores, and easily fitted by chiselling out a suitable recess for them in the wood, the rollers extending above about ¼in. In the absence of these, a pair of steel furniture domes to each runner, as in Fig. 4, will be a good substitute. In either case it will be advisable to fit these to the runners before screwing the latter to the chest.

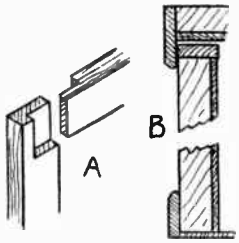


Fig. 2—Detail of joints

A simple metal handle is an advantage for ease in pulling the chest from under the bed. This could be just screwed to the framing, at top or bottom, but a centre fitting looks much neater and more symmetrical, undoubtedly. Some strain comes on the handle though, and the plywood should be strengthened against this by adding a strip of wood to the inside of the chest into which the screws of the handle can get a better hold.

A strip, wide enough, of course, should extend the full depth of the chest inside, as indicated by the dotted lines in Fig. 1, and be nailed to the framing at both ends, any strain on the plywood will then be cancelled out, the handle strip taking the lot.

The completed chest can be stained a nice oak colour, about the best choice, and varnished. It may be added, that if the chest is not intended for under-bed use, then its depth can be increased moderately, to hold more bed clothes if thought desirable.

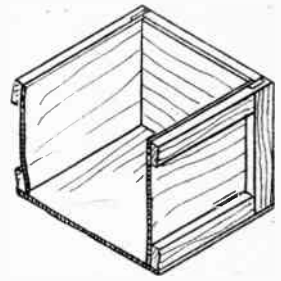


Fig. 3—Cut-away of construction

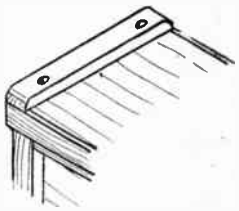


Fig. 4—Domes under rails

CUTTING LIST

Side frames (2)—2ft. 6ins. by 2ins. by ⅞in.
Side frames (2)—11ins. by 2ins. by ⅞in.
End frames (2)—1ft. 3ins. by 2ins. by ⅞in.
End frames (2)—11ins. by 2ins. by ⅞in.
Lid (2)—2ft. 6ins. by 2ins. by ¼in.
Lid (2)—1ft. 5ins. by 2ins. by ¼in.
Runners (3)—1ft. 5½ins. by 2ins. by ¼in.
Plinth and lipping—¼in. by 1½ins. by 16ft. run.
Lid rim—¼in. by 1½ins. by 8ft. run.
Plywood panels (approximate size) (2)—2ft. 6ins. by 11ins.; (2)—1ft. 3ins. by 11ins.; (2)—2ft. 6ins. by 1ft. 5ins.

The top edges of the box now receive a lipping of ¼in. wood, 1⅛ins. wide, all along each side and ends, to hide the ends of the joints and cover the board lining. A plinth of ¼in. by 1½in. wood is also glued and nailed along the bottom, both these being shown at (B) in Fig. 2. The upper edges of the plinth should be bevelled off, it looks better so, improving the appearance quite a lot.

Now turn the chest over and across the bottom of it screw three battens of wood, one at each end, and one across the centre. These extend the full width, the end edges being bevelled off to look less conspicuous from the front. Glue, as well as screws, can be used here, to make a firm joint.

These battens form runners, and also

Lid

A lid for the chest can be made of framed up wood, as for the rest. Make it the same dimensions, rather on the full size, and cover on the inside with the plywood board. To the edges of this glue and nail a ¼in. by 1½in. rim all round, as seen in detail (B) Fig. 2. Bevel the bottom outside edges of this to match the plinth below.

No need to hinge the lid, it is quite as efficient as a 'lift off' one, but let the fit be reasonably close to exclude dust and moths. A neater job will result if the corner joints of plinth, rim, and lipping are nicely mitred.

Table Lamp—(*Continued from page 291*)

parts should next be threaded through the terminals at the bottom of the lampholder proper until the rubber covered parts are against the terminals and then secured by the set screws. The surplus bare wire is then trimmed off, taking care that no loose bits fall into the base.

Wiring

The lampholder should be given one or two twists (only) to shorten the wire and the base (not the upper part) should then be turned until the connecting thread engages and the two parts become one. This procedure avoids too great a twist on the wires and has the effect of drawing the upper part into the lower. The complete fitment should then be screwed down on to (D).

The usual flex should now be connected to the wires coming through (G); the wires could be soldered to make a really good job. The bare parts should, of course, be protected by one or two layers of insulation tape.

No specific instructions have been given regarding the switch or mains plug. The latter will depend upon the type of socket available. The switch could be of the small elliptical type obtainable in various colours, and incorporated in the flex close to the base (G) of the lamp, or the base itself could be adapted to take the small button type of switch used in commercial lamps. The shade is outside the scope of this article.

Variation

As already hinted, the present design can be varied. Using the same procedure for wiring there is no reason why the frame should not be elliptical or octagonal rather than circular, to quote but two examples. The base need not be circular, but should, nevertheless, afford proper support for the upper work.

The construction can also be modified to take a standard size lampholder with incorporated switch but the overall dimensions will have to be larger, or a top heavy effect will result.

Different Models

The space within the 'ring' could be filled in with a simple design which would add strength to the main structure. If this is done the design should be sketched out at the beginning (not forgetting the necessary 'tie-pieces' to the main frame) and cut out in triplicate as before.

Some half-dozen different models have been made by the writer, but the simplest is probably the best and more than one observer has been puzzled by the effect of a 'solid' wood ring affording no apparent connection between the lamp and supply flex. (282)

An attractive and mystifying electrical

NOVEL TABLE LAMP

THE essential tool for this job is a fret-saw. Plywood would be admirable material, but in view of its comparative scarcity nowadays, it may be necessary to build up the required thicknesses by using layers of thinner stuff, the grain of each piece running the opposite way to the next. In brief, we make our own plywood.

The design is shown in its most simple form, but can be elaborated in various ways if so desired. Some of these are touched upon briefly at the end of this article. The dimensions shown in the diagrams are taken from an actual model, but could be varied slightly. Too much variation would, however, spoil the balance.

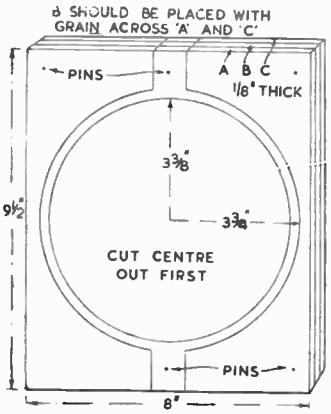


Fig. 1—Marking the boards

Construction

The pieces (A), (B) and (C) are pinned together temporarily and the shape at Fig. 1 cut out. They are then separated and marked so they can be re-assembled later in exactly the same positions.

Next, piece (B) (only) is cut further, as at Fig. 2, and glued and pinned on to (C) in its original position. When set the extension pieces of the tabs marked (x) should be trimmed off. We have now produced grooves each ⅛in. wide and deep, in which the internal wiring will be placed.

From some good quality lighting flex cut off about 2ft. and strip it of its outer covering (only), taking care not to damage the separate rubber-covered wires within. The latter are now placed in the grooves (Fig. 3) leaving about 6ins. trailing at each end for future connections. The wires should bed down nicely with a small clearance at the sides and top of the grooves.

Piece (A) is now trimmed off at the tabs to correspond with (B) and (C) and then glued and pinned permanently to (B) over the wiring, bearing in mind that only ⅛in. is available either side of the grooves. When set, this part of the job should be cleaned up.

Building

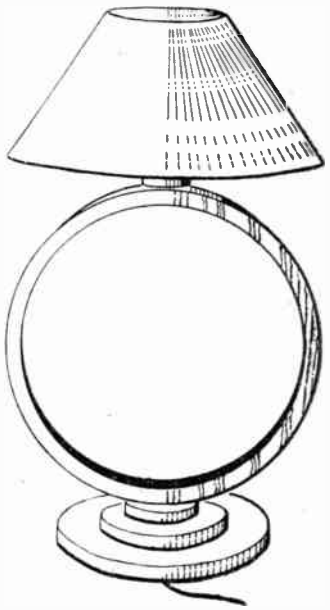
The next job is the cutting of (D), (E), (F) and (G) (Fig. 4). It is essential that (D) and (E), at least, should be made of thick ply or built up as mentioned above. The slots of these two should be made very slightly smaller than the dimensions shown. They are to fit over the tabs and the latter can be slightly glasspapered until a perfect fit is assured.

The slots in (D) and (E) should then be given a very thin film of glue and the pieces pressed firmly and squarely home (Fig. 5). Piece (F) is glued and secured to (E) by screwing from underneath. (G) is similarly affixed to (F) after fixing the 'button' feet on the former. The wires are, of course, threaded through as the attachments are made.

Cleaning

All these parts should be cleaned up, and in fact, can be stained and polished or painted before assembly, if desired. The same applies to the 'ring'. A final touch up will probably be required when the whole job is finished.

The actual polishing or painting is a matter of individual taste. The present writer has stained and polished the 'ring' a dark walnut, (D) and (E) ebony, (F) dark walnut again and (G) (the main base) ebony.



Another effective model has been made in cream and black enamel, which completely hides the various edges.

Electrical Parts

We now come to the actual electrical parts. The lampholder is of the sub-standard (small) batten type to take a so-called candle lamp. The latter is of the small conical type made for domestic voltages. Both fitments are obtainable from any reputable electrical dealer at reasonable cost.

As is usual, the holder is in two parts, one screwing into the other. The base should be detached and placed (but not screwed) on (D) bringing the wires through. The wires should then be marked at a point approximately ½in. above the top edge of the base, and the wires stripped of their covering from that point to their ends. The stripped

(*Continued foot of page 290*)

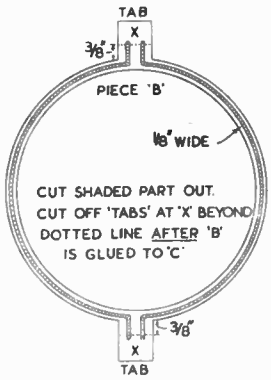


Fig. 2—The second layer

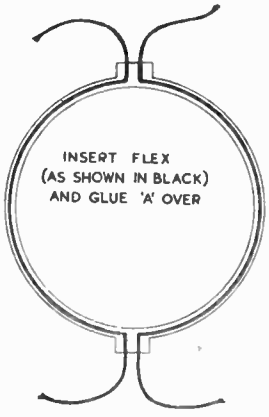


Fig. 3—Flex in place

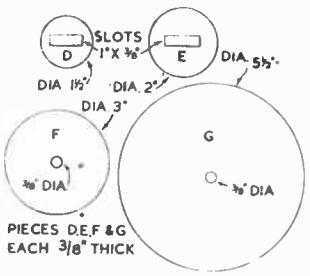


Fig. 4—Bare parts

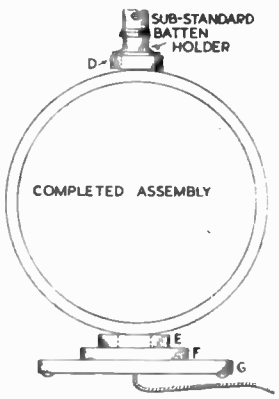


Fig. 5—The whole assembly

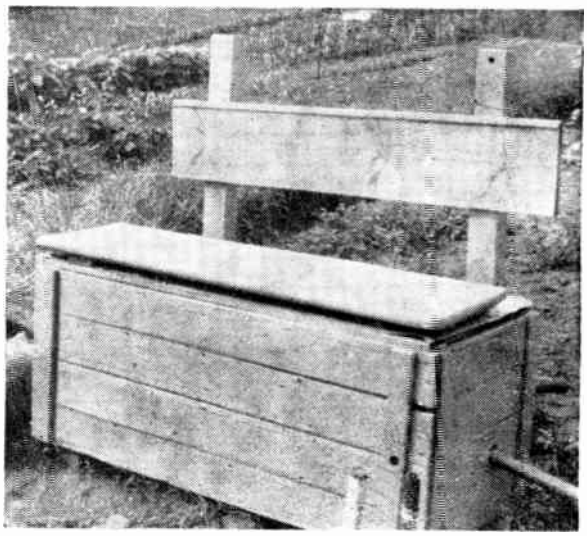
How the home carpenter and gardener can make a handy

GARDEN-SEAT TOOL BOX

HERE is something without which no garden away from a house is complete. Almost all the allotments in this country are in use these days, but unless the amateur gardener owns a greenhouse or can afford a shed, he usually lacks a place to keep his garden tools. Carrying them from the house and back again each time is irksome—and a good enough reason for making a tool box.

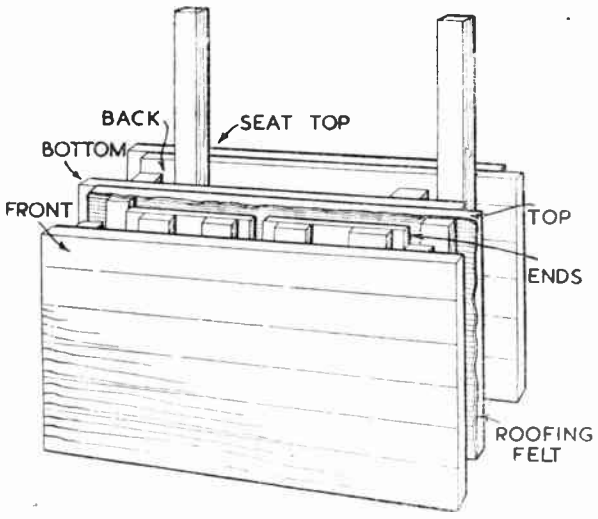
Also, unless there is a garden seat on which he and his helpers may sit in the sun and chat, or rest, he has not known the full pleasure of gardening.

This design, then, fills both these needs, and has the added advantage that it may be pre-fabricated at home in a short time and taken up to the garden in sections which are easier to handle than the finished article, and which only require hammer and screwdriver on the actual site.



Size of Box

The box itself is 3ft. 6ins. long by 2ft. square. This size is ample to contain spades, forks, small bags of fertilizer and lime, and insecticides. For tools with long handles, suitable holes may be bored in one end and the handles pushed through. The metal end is kept perfectly dry inside the box, and the part of the handle which is outside will not come to much harm, for it is well clear of the ground and rain soon drips off it. The truth of this will be seen from the photograph of a finished 'Garden-seat' Tool Box.



Showing most of the pre-fabricated parts and how they are packed for carrying to the site for erection

Materials needed do not have to be expensive. Rough-finished or second-hand wood is quite good enough for all except the seat, and, apart from nails, the only other requirements are part of a roll of roofing felt, a pair of hinges and a padlock fastening.

Construction details:

Back. Planks ($\frac{1}{8}$in. to 1in. thick), 3½ft. long, and to a total width of 2ft. A single plank, any width, about 3½ft. long, for the seat back. Two lengths of wood about 2ins. square (or suitable metal bars) 4ft. long. Nail box planks squarely to one end of square wood and seat back across other end.

Front. Planks (same size as above and also to a total width of 2ft.). Two battens 2ft. long (any reasonable width and thickness) to fasten planks together.

Top. Planks (as above). Two battens as above. Roofing felt 2ft. wide by 3½ft. long to be fitted under battens. A single piece of well-finished wood (as in photograph) or several narrower pieces nailed evenly across battens for seat.

Bottom. Planks (as above). Two lengths of wood about 2ins. square and 2ft. long to be nailed on as battens and to form a firm base to keep the box off the soil.

Ends. Short planks 1ft. 11ins. long to a width of 2ft., and two battens, as above for each end.

To move to the garden from the home, these sections may be tied together, putting the small ends between two of the larger sections, and so taken to the site for assembly. If no other transport is available, they may be rested on one pedal of a bicycle, secured to the frame and so wheeled along.

The assembly is simple. The back, front and bottom are nailed on outside the ends. The remainder of the roofing felt should be used to line the sides of the box. The bottom is best not lined, for should any water work its way in, it will then drain out and not remain to rust the tools. The top should be fastened to the box by the hinges at one end, so that long tools may be easily withdrawn, and the fastening to the other end.

A length of strong string or thin rope to prevent the top from going completely over is an advantage.

In Position

Before putting the 'Garden-seat' Tool Box in its final position, the ground should, of course, be trampled hard and bricks or stones used, if available, as a firm dry base for the thick bottom battens.

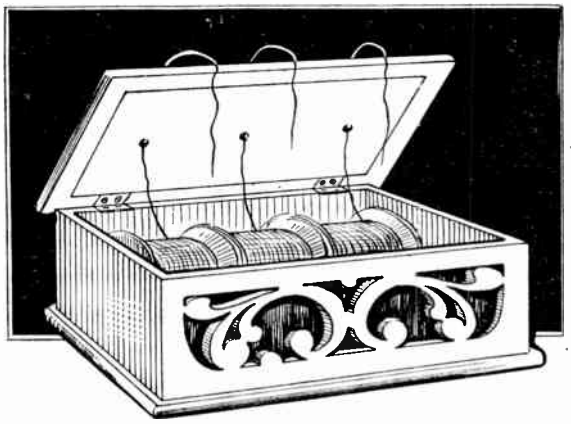
For your own garden, or as a present to a friend, or as a profitable sale to an acquaintance with an allotment, this design should be found ideal. (329)

SUMMARY OF WOOD SIZES, ETC.

Planks –3½ft. long with a total width of 8ft. (for box bottom, top and sides).
Planks –1ft. 10ins. long, with a total width of 4ft. (for box ends).
Planks –3½ft. long of any reasonable width (for seat back).
8 battens, of any width and thickness strong enough to make a rigid job, not less than ½in. by 3ins., and each 2ft. long.
2 bars of wood about 2ins. square and 4ft. long (for seat back).
2 bars of wood about 2ins. square and 2ft. long (for base rests).
1 plank of smooth wood, 3½ft. by about 1½ft., or several narrower planks (for seat top).
Roofing felt –3½ by 2ft. (for top), and about 22 square feet (for lining sides).
Note—Ironmongers will usually sell part of a roll and, as rolls are normally 3ft. wide, 4yds. of felt is ample.

Patterns on page 303 for this handy

BOX FOR COTTON REELS



WE are able to give this week full-size patterns for the making of the useful and novel box shown here on this page. It is a box to hold three reels of cotton or silk, and its usefulness lies in the fact that as a length is wanted, it can be drawn direct through holes in the lid. This makes for ease in measuring off, and the cotton or silk is not handled, therefore, it is always clean and ready when wanted.

The box is designed to hold three reels, but, of course, by extending its length it can be made to hold four reels or more as desired. Such an article as this would make an ideal gift for a lady.

The fretworker, we feel sure, will be pleased with this design, especially in view of the fact that all the fretted parts are given full size and any drawing out in enlarging the design or tracing out is, therefore, obviated.

Patterns

It will be seen from the patterns on cover III of this issue that the floor and the lid are the same size. So, having stuck down the pattern of the lid, all the fretted parts can be cut and the outline also.

Then, when the outer edges have been cleaned up and slightly rounded off to give a neater appearance, this cut-out may be laid on another piece of $\frac{3}{16}$in. wood and a line drawn round in pencil. After this has been cut round, the process of cleaning and shaping is repeated, and the whole top surface made smooth, ready for building and gluing on the sides and ends.

The sheet includes both the sides, as they contain a definite fretcut panel and, therefore, no duplication of the design is necessary. So the work is really straightforward. Each side may be cut independently, which is beneficial where small frets and interior points and corners occur.

Use a fine fretsaw for all the cutting, and take care in cleaning off the paper pattern not to break off any of the more or less fragile parts of the design.

Always use a large-surface glasspaper block, and bear in mind always to rub in the direction of the grain of the wood and never cross ways.

End Parts

The ends of the box are plain pieces, and the outline of one is given full-size on the pattern sheet. Instead of pasting down this pattern, it is only necessary to lay it on the piece of wood selected and prick in each corner lightly.

Now connect up these points with a firm pencil line and cut round with the fretsaw. By doing this the task of cleaning off the paper pattern is obviated.

The second end of the box may be outlined by drawing a line round that part already cut out.

The matter of gluing the four parts is simple. After lightly pricking in the positions of the ends and sides on to the ends and sides on to the floor piece—as seen in the dotted lines on the pattern of the lid—draw in faint pencil lines as a guide for the gluing down.

Apply a thin coat of glue to the lower edge of one of the sides and put this in place on the floor, pressing it down gently until it stands upright on its own. Now take each end in turn, apply glue as before and put some also on one of the upright edges.

Put these in place on the floor and press them carefully to it and to the extreme ends of the already-erected side. The other long side is finally added, making quite sure that the vertical surfaces are all flush.

The box should now be laid aside until the glue has thoroughly hardened. As the box may at times be subject to much handling, it would be advisable to drive in one or two screws through into the sides and ends. The holes must be bored for these screws as a precaution against splitting the wood.

Overlays

The three circular overlays are next cut round and holes either drilled or cut in the centre for the passage of the cotton or silk. Glue these discs on over the holes in the centre of the lid and according to the dotted lines on the pattern.

It only remains to hinge the lid to the box. First screw the hinges to the lid, keeping them $\frac{3}{16}$in. in from the back edge and about $\frac{3}{4}$in. from the end. The positions can be judged from the sketch of the open box. Now lay the lid in place on the box and mark where the knuckles come on the top edge of the back.

Cut down shallow recesses sufficiently deep to take both flaps of the hinges. Test for depth again before finally putting in the screws, holes for which must be previously bored.

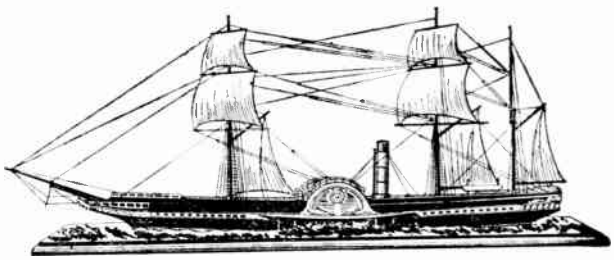
Lining

If it is desired, a coloured lining paper or even silk may be stuck behind the frets of the front, back and lid. If a more substantial job is required, thin pieces of stained wood would make for a better finish.

All the outside surfaces of the box may be polished if a dark wood like mahogany has been used, but if of oak, then a light stain should be applied with a rubbing of wax or oil as the finish. One of Hobbies H3 panels of wood ($\frac{3}{16}$in. thick) is large enough for cutting all the parts of the design.

A Waterline Model of R.M.S. BRITANNIA

Hundreds of readers have made this attractive model from Design No. 239 Special. Only 18ins. long, but what a marvellous exhibition piece it makes! The R.M.S. Britannia was one of the early steam-cum-sailing ships—built in 1840—to carry mails across the Atlantic. She was but 207ft. long with displacement of 2050 tons. She carried 115 saloon passengers. Designs are still obtainable from Hobbies.



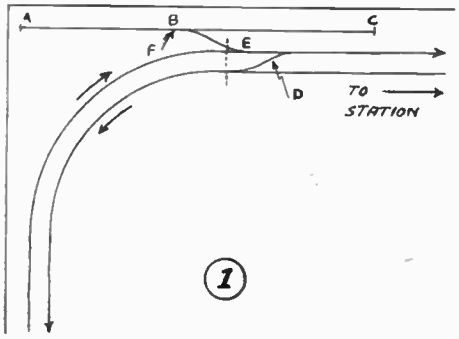
Problems solved and attractive results in this

MODEL RAILWAY LAYOUT

WHEN a Model layout has been installed in a room, the most difficult problem often becomes that of what to do with the corners and chimney-breast alcoves. If not treated correctly, these are apt to be space-wasters, and as such are not very popular with the enthusiast, whose available area is usually very limited, anyway.

If Fig. 1 is studied, it will be seen that a siding road (A-B-C) can be suitably run right into the corner and thus allow wagons or coaching-stock to be stored well away from the station beyond (C).

It will be noticed that the entry to the siding is *via* a trailing point (E), and that a trailing crossover (D) is fitted at the end of the straight main-line run to enable vehicles to be shunted from the 'up' to the 'down' main-line before entering the siding.



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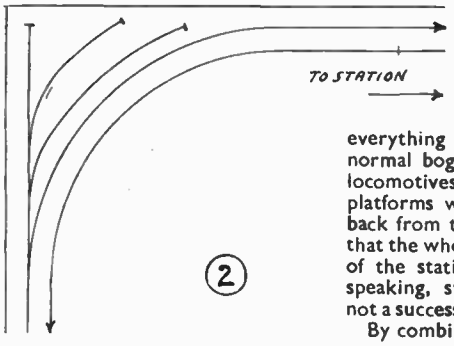


2

This method of entering a siding is important, and in Fig. 2 is shown the way *not* to arrange the tracks. In this case the point (A) is a facing one, and the siding is entered direct, instead of first approaching on a shunting road (A-B-C) in Fig. 1.

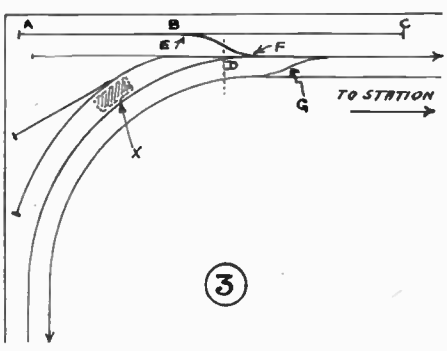
Returning to Fig. 1 for a moment. It must be observed that the length of the shunting road (A-B-C) must be equal to twice the length of the locomotive and train using the siding, and that the length (A-B) must also be equal to (B-C); so that the engine can clear the points at (F) should a fast train desire to pass on the main line; for the points (E) and (F) would be operated together for safety's sake.

In a siding layout as shown, vehicles could not be worked by engine power up to the buffers at (C) unless there was room for the engine and stock to draw right up to the buffers at (A). For this movement the loco would pull its train into the siding, whereas if stock was to be left between (A) and (B), it should push it in.

In Fig. 3 is shown a variation of Fig. 1 wherein the straight siding (A-B-C) is supplemented by two more curved roads, both of which leave the latter by means of simple left-hand turnouts (D) and (E). As the radius of these two siding roads can be considerably less than that of the main-lines, a short length of straight track can often be inserted between (D) and (E).

With a view of using simple points it is suggested that the point at (F) takes the form of a left-hand turnout joining up with a right-hand one at (B) Fig. 3; the curved part of (F) forming the entry into the main-line curve.

The trailing crossover (G) can well be positioned at the extreme end of the straight part of the main-line, and can then be formed by two left-hand turnouts. The crossover can be placed as near up to the station (further left) as possible without bringing it within the station platforms; which is not good practice.



3

Another method of utilising corner space is by arranging the loco department there, placing the turntable as close into the corner as possible. In this case two or more siding roads can be run direct from the turntable, as shown in Fig. 4, thus utilising practically all the available corner space.

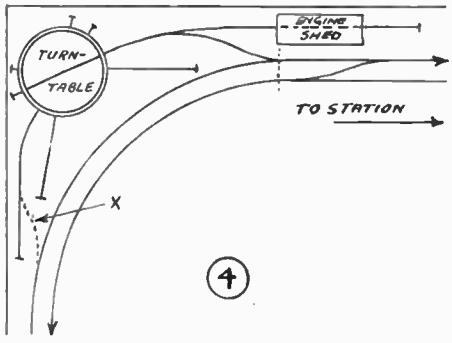
In modelling Fig. 4, do not fall into the inviting trap of putting in a facing entry road at (X), for this would be very definitely wrong.

It will be realised that the smaller the radius of the main-lines, the smaller will be the wasted corner area, and *vice versa*, but even with small radius tracks, sufficient room can usually be found for at least one siding road without encroaching too much on the main-lines.

If the introduction of additional track is out of the question when it comes to 'filling the corners', then the judicious introduction of a signal-box at the correct distance from the main-lines is the next best thing. With a view of improving the appearance of the waste ground, however, it is a good plan to build up behind the signal-box a 'hill' of rough lathing and sized brown-paper, 'cutting out' a site in which the box will easily fit (X) Fig. 3.

Unless your main-line curves are of at least 4ft. 6ins. radius, do not toy with the idea of putting a station in a corner. On a model of a very small 'single-line' railway, where tank engines and very short four-wheeled coaches are used, everything will be satisfactory; but if normal bogie coaches and express type locomotives are the order of the day, the platforms will have to be placed so far back from the rails to clear the vehicles that the whole 'rightness' and appearance of the station will be spoilt. Broadly speaking, stations built on curves are not a success.

By combining the lessons learnt it will be found quite easy to design a small loco department to fit into a 6ft. long chimney-breast recess. The great thing to bear in mind—whatever the plan, is never to allow entry by any other than a trailing point, and to always try to arrange a shunting 'spur' if width permits.



4

In all such matters it may seem trivial to worry about such apparently little things, but in the writer's experience many an otherwise well-designed model railway has been marred by such things as would never be tolerated in real railway practice. The more like the 'real thing' we modellers can get, the greater pride we can justifiably have in our model line; which is then a true Model Railway. Attention to details always pays good dividends.

Turn the handle for delivery in this novel

AUTOMATIC TEA CADDY

DURING the thousand years that tea caddies have been in use a very wide range of designs have been made. The very earliest caddies were made of porcelain by the Chinese, who were drinking tea as far back as the 6th century. These early caddies were followed by metal ones of brass, pewter and then silver; some of which were very ornamental and extremely beautiful.

Wooden caddies were of a later date and have attracted the attention of many famous craftsmen. Both Chippendale and Hepplewhite made a large number of very attractive caddies, chiefly in mahogany.

The automatic tea caddy described on this page is quite a different article from the masterpieces of these craftsmen and is more suited to present day needs. By turning the handle on the side a certain number of times the correct amount of tea is measured out to suit the number of people to tea, and is delivered into a tray beneath, ready to be tipped into the teapot.

The actual working can be easily understood by studying Figs. 1 and 2. The top chamber, which will hold a whole packet of tea, is tapered at the bottom where it is a tight fit with the roller. A hollow is cut in this roller sufficient to hold a teaspoonful of tea.

By turning the handle of the roller round once, a spoonful of tea is emptied into the tray beneath, two turns will give two spoonfuls and so on. When the required amount is delivered, the tray is removed and emptied into the teapot.

Commence by making the outer case of the caddy—four sides and the base. Two sides are cut 6ins. long and taper from 3½ins. wide at the top to 2½ins. wide at the base. The back piece is 6ins. long and tapers from 4ins. at the top to 3ins. at the base. In cutting the front, allowance must be made for the tray opening at the base, the length will, therefore, be only 5ins., but the other measurements will be the same.

The base is 4ins. square with a thickness of ¼in., which is the same for all the case woodwork. The plainness can be taken off the base by chamfering the edges, by putting a moulding round, or even carving the edges.

At this stage three of the sides can be fitted to the base—the back is left off until last, so as to enable the inside works to be fitted and adjusted. Carefully glue up, using a small number of panel pins to give extra strength if thought necessary. When using panel pins they should be punched right in and the holes filled with a wood filler to match the woodwork.

The roller for measuring out the tea should now be made and fitted. A piece of circular wood 1in. diameter and 3ins. long, such as dowel rod or a piece of broom handle will do for this.

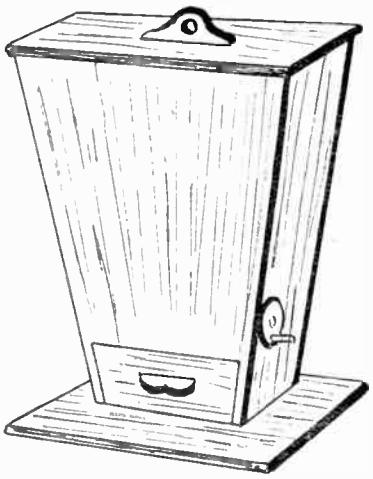
Reference to Figs. 1 and 2 will show that a depression has been cut out just large enough to hold one teaspoonful of tea. The easiest way of doing this is with a gouge, afterwards making the whole quite smooth with glasspaper.

The exact position for the roller is not important, but it is best put low down near the tray and rather to the front, as shown in the sketches. Be very careful when drilling the pivot holes in the roller to get them exactly central.

As the roller is not required to do any heavy work, ⅛in. diameter dowel rod will do well for the pivots. The handle end should project outside the case about ⅜in., while the other end is cut off flush with the case.

If the pivots are made a tight fit it will not be necessary to glue them in, but that you must decide for yourself. A small washer on each end of the pivot between the roller and the inside of the case may be needed to eliminate side play to the roller.

The handle, consisting of a 1in. diameter disc of wood with a piece of ⅛in. dowel rod glued in near its edge, can now be fitted in position. It is best for the handle to be at the bottom when the cavity in the roller is at the top.



The bottom part of the tea compartment must now receive our attention. Its object is to direct the tea in to the roller cavity. Quite thin plywood will do for this purpose, and Figs. 1 and 2 give a good idea of the shape and positions for the four pieces. The bottom edges should just touch the roller so that there are no gaps for the tea to trickle through.

Having got this part well glued up and made sure that the joints are tight, the back can be fitted on. The tray can now be made to fit in the bottom of the case. It is best to cut a piece of plywood 2½ins. square and about ⅛in. thick to fit exactly into the base and then to build the sides around it.

First cut the front to fit the hole left at the base of the case 1in. wide, ⅛in. thick and just over 2½ins. long. Fig. 3 clearly shows the positions for the other parts—the gap at the back of the tray is about ½in. wide to enable the tea to be emptied into the teapot without spilling.

As the case gets smaller towards the bottom, so also must the sides of the tray slope off at the same angle. This however, is only slight and will not make the job too difficult.

A well fitted lid will complete the job, and for this cut a piece of wood 4¼ins. square and round off the edges. A ¼in. square fillet glued neatly round the inside will make the lid a nice fit. Cut a handle from a 2in. length of ⅜in. by ¼in. wood and glue in position. A slightly smaller one is also needed for the tray front.

After well glasspapering, a finish in keeping with the article can be given with either french polish or a wax polish. (338)

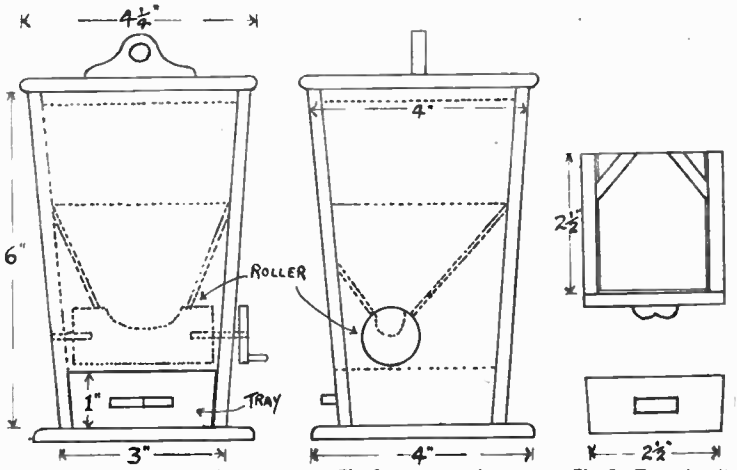


Fig. 1—Front section

Fig. 2—Side section

Fig. 3—Tray details

Your home can be much improved by sensible
FURNITURE PLANNING

NOW that hardboard is available in quantities and without licence, many may be interested in making themselves some new furniture units. Once you have acquired the habit, you will want to go on with more elaborate schemes. Sufficient light quarterings are now to be had and this is all you need, apart from beadings.

Large sheets of plywood also are advertised at regular intervals and this could be used for facing surfaces, although hardboard does have one very attractive side.

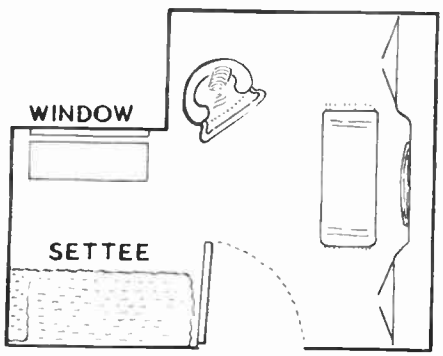


Fig. 1—A practical plan of a room

Here, as in most crafts, get down to a little planning on the kitchen table at a quiet moment. Buy yourself some graph paper at the local stationers and on this you will be able to sketch out your designs and see exactly what they look like.

Take into consideration the shape of the room. So often you may have a recess or an obstruction and also the position of the door and the fireplace, apart from the window. As a simple guide the sketch at Fig. 1 will give you a good idea of this lay-out. Note the compact, yet useful space allowed, especially at the small end.

As a further help you could draw the room out in Bristol board with a scale of 1ft. to 1in. With this as a guide you could then fit in your units, taking the idea of the measurements from existing sets of furniture.

Even if you yourself do not carry out the actual making, these items of measurement and trial and error will be most helpful to the carpenter or whoever you intend asking. You will not be up against the problem of the carpenter not being quite clear about various points.

In Fig. 2 you will see how the fitment is designed to fix in that particular corner which is near and quite close to the window. That drop in the design makes just that little difference in the appearance of the room.

Next, remember if the unit is to be fixed in or removable. This alters the construction considerably. If it is a fixture, then allow space for cleaning around the sides. You will also need to make it much stronger and able to take more strain.

Space permitting, you may be wanting to make a series of built-in shelves and cupboards around the existing fireplace and you will note that the shelves are kept low and the two cupboards a little under the height of the fireplace. In keeping with this trend the door handles are of the flush type in a neutral colour and fairly long. Any other type would be out of place; in Fig. 3 you will see how this can look.

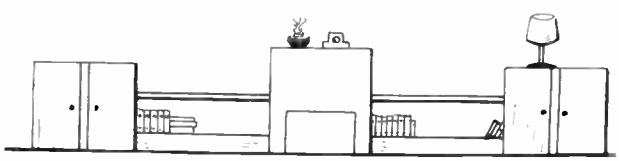


Fig. 3—Fireplace, low shelves and cabinets

Your squared paper can be most useful if you decide how many inches you wish each square to represent. When decided, make a note of it at the top of the paper.

Here are some tips before designing other units. The base of the furniture should always be the same width as the top, otherwise a top-heavy effect is obtained. In the case of use of colour, if you are using two colours, keep the darker shade for the base.

Any furniture must conform to some limits in width and you will find that 16ins. to 18ins. is quite deep enough for built-in parts. A little more space can be used for removable items. The idea of building up from the bottom is a good plan and does away with the chance of that top-heavy look. This is shown in Fig. 4. Handles look best if placed one-third from the top of the cupboard. If your design is right, this should be a convenient height.

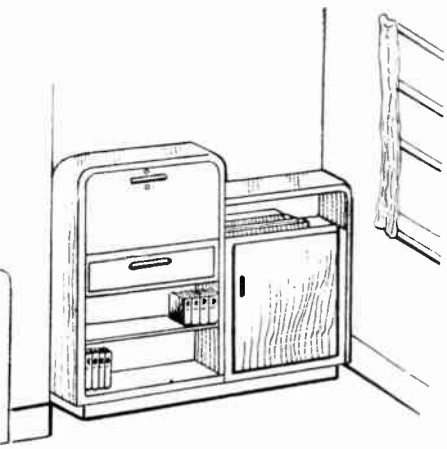


Fig. 2—A corner fitment

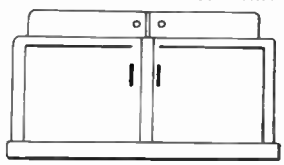


Fig. 4—Solid Basework

Last but not least, what about the position of shelves? Plan first exactly what is going to be kept in the cupboard or unit. Shelves can be too deep; they can be too close or too narrow. It is also a good plan to make them easy in fit so they can be adjusted at any time should you decide to use the space for something else. (233)

Print Drying—(*Continued from page 297*)

With batten holders these holes need only be large enough to take the cable, but with shade holders the circular openings will have to be sufficiently large to take the full metal cylinder, and it greatly helps firmness of the lamps if the holes are taken out carefully so as to just exactly take the metal which has to be slightly forced (or even screwed) into position. The collars then make the already tight fitting more secure still.

When drying prints naturally—and let it be repeated that all types of paper (bar glossy), i.e. matt, semi-matt, velvet, etc. must be so dried—it is good to first take off the surplus moisture by pressing for a moment between two sheets of blotting paper.

The blotting books one can buy are good for this. The book dries out between successive batches of prints and is never used up. The idea of drying off surplus moisture is to help the even drying of the prints which, as we have said, is of the utmost importance.

MOBILE CRANE MODEL DESIGN

This week's design is for a model of an attractive and unusual crane. The materials for building (No. 2884) are obtainable from Hobbies Branches for 6/1 or 6/11 post free from Hobbies Ltd., Dereham, Norfolk.

Practical advice for the amateur photographer—

PRINT DRYING HINTS

THE main point about drying all photographic prints is that they must lose their moisture evenly. Any quick, patchy drying, which hardens off some parts while others are still wet, tends to cause the paper to warp and buckle—sometimes to such an extent that it cannot again be straightened out. Uniform drying, therefore, is essential.

There are two major classes of printing paper—glossy and matt—though there are numerous varieties in each. Both can be dried 'naturally' but the glossy kind can be given an extra high gl.ze by drying on a smooth plate of one sort or another. The process of 'gl.zing', as it is called, has been dealt with recently, so we will keep here to the methods by which prints can be assisted in natural drying.

Not Blotting Paper

Laying out on sheets of clean blotting paper is often suggested, but this has disadvantages. The paper below the prints gets very damp and makes complete drying out a slow business, while patchily damp blotting paper will itself cockle to some extent and therefore does not help in the final flatness of the pictures.

Hanging by one corner also is not too good as, except in the case of big enlargements, the prints develop a diagonal curl which is particularly hard to eliminate, while the top corner is always marked by the clip or peg.

The ideal condition is to get air, either warmed or at usual room temperature, all round the prints as they lie in a horizontal position and to this end fine gauze or butter muslin is a great help. This is stretched over a simple frame as (A) in Fig. 1, and the prints are laid out to dry on the taut material, as (B).

A Handy Frame

The frame shown is 16ins. by 21ins.—this size being handy, as it allows of four rows of 3¼in. by 2¼in. prints with eight prints to a row, having about a ¼in. space between each. A less number of prints could be given more room around, which would all be to the good.

Lengths of 1½ins. by ⅜in. wood are used for the side strips (a) and (b) and the corners are reinforced with the small triangular piece (d). A simple dovetail helps to make the corners firm, but is not essential, and the lengths can be just overlapped. Upon this frame the gauze or butter muslin is stretched, and to give tightness it is taken down and under, the lengths being secured on the inside by a series of drawing pins.

Turning Over

When the prints have been laid out (face up) on the material—care being taken to see that they do not overlap—the frame is put horizontally on some airy place so that a draught can get up from below, the supports, whatever they are, touching the wood only, the gauze being quite free.

It is a good idea to turn the prints over when nearly dry as this helps flatness—the gauze or muslin of course being kept entirely clear of dust.

Postcards drying naturally tend to acquire a bad curve which is due to the stiffness of the material and is very difficult to get out. Curling can be prevented, however, by using the frame shown in the lower sketches of Fig. 1. This is a length of board (e), 6ins. wide and 17½ins. long which is supplied with the lips (g)—two thin strips of ½in. wide wood.

The postcards are partially dried on the gauze and then transferred to the frame, being clipped face up between the lips as indicated, when it will be found they dry right out with just the slightest backward bend—which is an advantage, as all prints in time tend to come forward.

To hasten 'natural' drying it is an excellent thing to have a heat drier, the heat being supplied by two electric bulbs encased in a container as Fig. 2. First required is the gauze-covered frame (A) which in general is the same as the one just described. In this case, however, a convenient size is 12ins. by 18ins., which means that it will hold three rows of seven each of 3¼in. by 2¼in. prints at any one time.

There can be no inside corner-pieces with this frame as it has to slip over the top of the box lamp-container, so it is strengthened by four small angle irons (p) on the outside. As before, the gauze or butter muslin is stretched over the top and taken round under each member and secured again by a series of drawing pins pushed well home.

The Container

The container (B) is a simple box of 17ins. by 11ins. base, 17ins. by 6ins. side and ends to fit. The quickest way to assemble strongly is to attach ends and side to the triangular pieces (t). The base then is screwed to the end of these. Perfect safety from fire and a greater heat-conserving property is given if the inside of the box is lined with thin asbestos. Fit also the two strips (v), 1½ins. down at each end for the frame to rest on. These are 12ins. by ½in. by ½in

Fitting the Lamps

Having got the gauze frame and box finished, lastly fit the lamps. Batten holders can be used for these with advantage. If ordinary shade holders are employed the shade collars are used to secure the holder tightly in the wood. The lamps are nearer the bottom of the container than the top to help better diffuse the heat, so the holes for these are bored 2½ins. from the base.

(*Continued foot of page 296*)

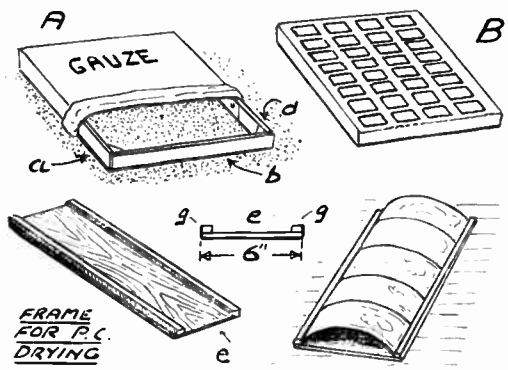


Fig. 1—Frames and materials

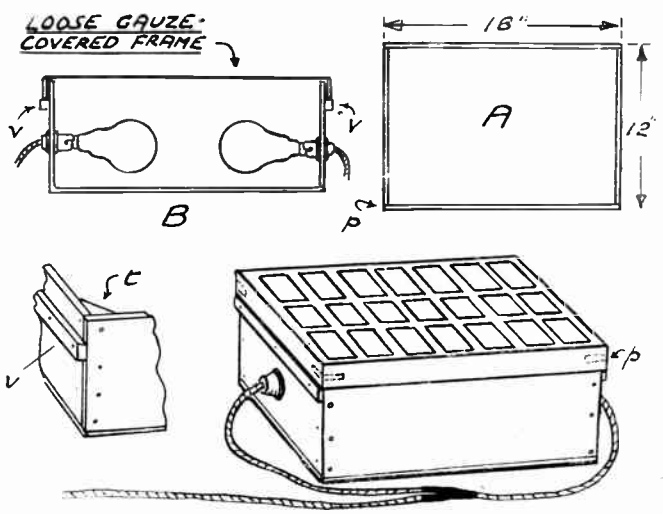


Fig. 2—An electric lamp container

Some more interesting experiments in our series of

HOME CHEMISTRY

AS every amateur photographer knows, 'hypo' or sodium thiosulphate is indispensable for removing unaltered silver chloride or bromide. It is, however, not only the photographer, nor even the analytical chemist, who finds it so useful, for in several industries it is a valuable aid, such as in bleaching, candle making, dyeing, ink making and in the leather industry. In many chemical researches, too, the modest hypo has been a vital factor in the discovery of new substances.

A First Proof

But one substance with which sodium thiosulphate could help still eludes the scientist, and that is the parent acid itself, thiosulphuric acid. When we consider how many other acids may be prepared by acting on their salts with a mineral acid it seems reasonable to hope that thiosulphuric acid could be prepared similarly. Such is not the case, as you may prove by the first experiment.

Make a *fresh* solution of sodium thiosulphate (for an old one is usually partly decomposed). Add to it dilute hydrochloric acid. The solution remains clear and chemists believe thiosulphuric acid to be present at this stage. But in a few seconds an opalescence appears.

This increases to a turbidity and finally a precipitate of sulphur is formed. Smell the liquid. The acrid odour of sulphur dioxide will be noted. It is believed that the acid quickly splits up into water, sulphur dioxide and sulphur. An interesting fact is that so unstable an acid can form such a stable salt as sodium thiosulphate.

The Use of Salt

The principle behind the photographic use of the salt is easily demonstrated as one of solution. Make a little silver chloride by mixing silver nitrate and sodium chloride. Wash the curdy white precipitate of silver chloride once or twice by decantation and add sodium thiosulphate. The silver chloride dissolves. This solution depends on the formation of the soluble double salt silver sodium thiosulphate. We could isolate this double salt from this solution, but it is much more easily prepared by the following method.

Sodium Thiosulphate

To sodium thiosulphate add silver nitrate drop by drop, preferably from a dropping funnel or a burette, stirring the mixed solutions during each addition. White silver thiosulphate is precipitated, but immediately dissolves. When a slight permanent precipitate is formed, filter and add an equal volume of alcohol to the filtrate (methylated spirit will do). A white precipitate of silver sodium thiosulphate is thrown down.

Silver thiosulphate itself is unstable, but gives us an easy method of making silver sulphide. Add enough silver nitrate to sodium thiosulphate to produce a copious white precipitate of silver thiosulphate. In a few seconds an almost startling series of colour changes commences.

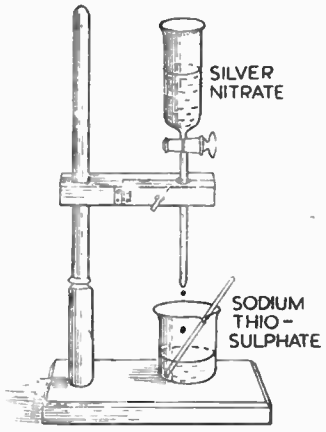
Colour Changes

Cream first, then yellow, orange, brown and lastly black. Warm the black silver sulphide in the solution for a minute or two to complete the reaction, then filter and wash the sulphide prior to drying it. If you test the filtrate with blue litmus you will find it has become acid, the silver thiosulphate having split up into silver sulphide and sulphuric acid.

At the beginning of this article mention was made of sodium thiosulphate being used in the bleaching industry. It is not, however, used to bleach, but to remove excess chlorine from the fabric, which if left in would 'tender' the cloth, i.e., cause it to rot. Add some chlorine water to sodium thiosulphate. A precipitate of sulphur is formed and the odour of chlorine disappears. Because of this application sodium thiosulphate is called an 'anti-chlor'.

Most thiosulphates are soluble in water and those which are insoluble will dissolve in solutions of the soluble ones, as we saw in the case of the silver salt. One of these insoluble ones is barium thiosulphate and which opens the door to further experiments.

Make strong solutions of barium chloride and sodium thiosulphate, mix them and filter off the white precipitate of barium thiosulphate, then dry it in a cool oven. Keep half for your chemical stock and make the other half into a thin paste with water. Add to this very gradually powdered iodine as long as it is decolourised.



Making silver sodium thiosulphate

If you have no solid iodine you can make some by passing chlorine into potassium iodide solution, washing the precipitated iodine by decantation and filtering it off. The resultant paste may be used instead of the dry solid.

Separation

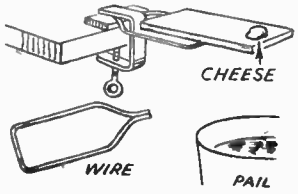
When a fresh addition of iodine is not decolourised, the reaction is complete, two new substances having been formed —barium iodide and barium tetrathionate. To separate them shake up the semi-solid white mass with methylated spirit. This dissolves out the barium iodide and excess iodine and leaves untouched the barium tetrathionate.

As the latter decomposes on warming with water it cannot be purified by recrystallisation; hence it better to wash it once or twice more with spirit and allow it to dry at room temperature spread on filter paper. The barium iodide may be recovered by evaporating off the spirit on the water bath until the mass is dry and white and no longer yellow with iodine.

In the last experiment we can show sodium thiosulphate to be a reducing agent. Add a solution of it drop by drop to copper sulphate. The solution becomes yellow, for the cupric salt has been reduced to a cuprous salt. Now boil it. Black cuprous sulphide is precipitated, which you can filter, wash and dry in the usual way for your chemical stock. (283)

Mouse Trap

OBTAIN a rectangular piece of three-ply board about 6ins. long and 2ins. wide. Next get a length of wire, and bend it as shown in Fig. (1). This should be fastened to the strip of wood with 2 staples to allow the latter to swivel. A piece of cheese is tied to the hole in the end of the wood, and the trap is then secured to the table with a fretwork clamp and a small piece of wood, as shown in the detail. A bucket is half filled with water, and is placed on a chair, just under the end of the wood.



French Chalk Substitute

WHEN mending a puncture, to prevent the inner tube sticking to the tyre, french chalk is generally used, but when none of this is available, an excellent substitute is flour, which is applied in the same way as french chalk.

The tools and apparatus for ensuring good work in MAKING DOWEL JOINTS

AMONG the many forms of joint used by the amateur as well as by the professional carpenter, the dowelled joint is one of the most popular, and the reader will find many references to it in the various jobs mentioned in these pages. It is a really simple and straightforward means of joining thick parts of woodwork together, but, like everything else, it needs a little experience and must be done correctly and well.

Obviously, if good work such as pieces of furniture are being made, there is a good deal of strain on the joining pieces, and for that reason it is always essential to take care and note one or two important points.

Dowelling as most readers know, is a short round rod which is glued into holes bored in two pieces of wood which it is desired to join.

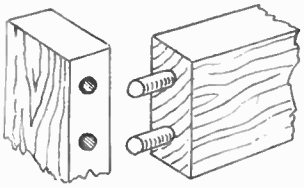


Fig. 1—End of dowelling

The whole thing is shown quite clearly at Fig. 1, where a right angle joint is made with two short dowels. Formerly this dowelling had to be made as required, and even now some workers prefer to make their own from strips of square section wood.

Dowel Plate

A useful dowel plate is shown at Fig. 2. whereby this job can be done. This is a strong heavy metal plate in which are drilled two or three holes of the size likely to be required. The most popular are $\frac{5}{16}$in., $\frac{1}{4}$in. and $\frac{3}{8}$in. for all ordinary work. This plate is screwed down to a piece of wood about 1in. thick, from which the middle has been cut, as can be seen in the broken-away portion of the diagram.

Supposing a $\frac{3}{8}$in. dowel is to be made, the strip of wood to make it must be planed just under $\frac{1}{2}$in. square and then shaped roughly down to octagonal shape. It is then stood over the $\frac{3}{8}$in. hole in the plate and hammered through. The sharp edge of the metal will cut away the unwanted wood, and the strip emerges a round dowel ready for use.

As these dowels are never sunk into the wood more than 1in. or so, the rods need not be more than about 4ins. long when made. A convenient method of preparing the lengths ready for shaping the rods is to saw off blocks two or three times the required length, and to split them roughly into rectangular sticks.

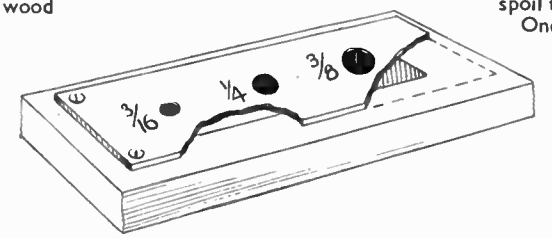


Fig. 2—Cut-away view of plate

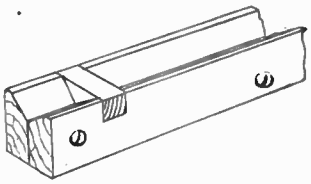


Fig. 3—A cutting tool

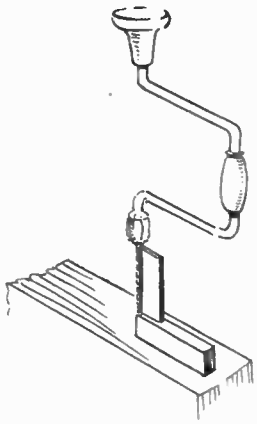


Fig. 4—An upright brace

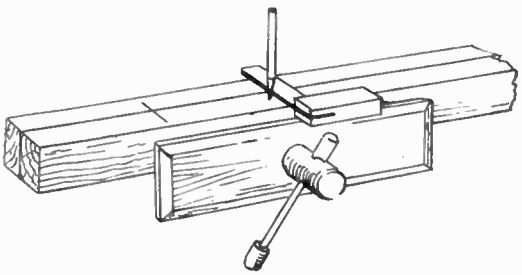


Fig. 5—Marking the work

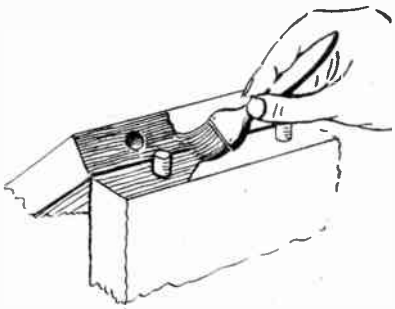


Fig. 7—Gluing the joint

These sticks are then planed, first to a square section, then into hexagonal section and finally circular.

A handy little tool for holding the sticks while planing is shown in Fig. 3. The dowels can finally be cut into lengths and the ends trimmed square. If the dowel is cut with a fine narrow groove from one end to the other, this allows for the escape of air and surplus glue when being driven in. This business of making dowels, however, is not now necessary to the amateur because dowel rod of all diameters is sold ready to use by Hobbies Ltd.

If the rod is being bought for dowelling alone, it will be best to order it in short lengths, so it may the more easily be sent through the post. Obviously, a 3ft. length of $\frac{1}{4}$in. round rod is likely to get damaged in the post unless supported by splines which in turn add to the cost.

Suitable Diameter

The diameter of the dowelling used should not be more than half the thickness of the board into which it is to be put. Its length, too, will be the same in both pieces, and it is not usual to sink it more than 1in. Dowelling, as well as the job on which it is being used, should be of seasoned material, for, obviously, if not, it will shrink as it dries and so break away from its surrounding work, and spoil the effect of the joint.

One great point to remember is that the holes for the dowel must be bored accurately. They must be opposite each other on the two pieces of wood to be joined, and they must also be at right angles from each direction. That is, the brace must be held perfectly upright, as shown in Fig. 4.

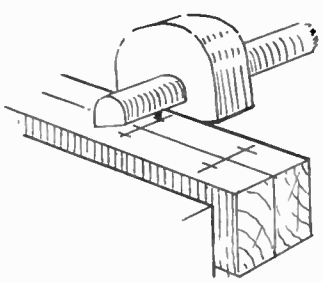


Fig. 6—The marking gauge

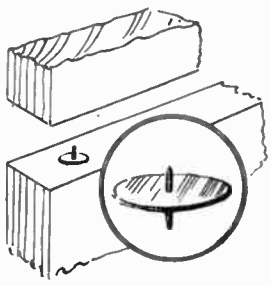


Fig. 8—Double-ended pin

This is not the easiest thing to do for the beginner especially, but a little practise will soon bring it about. The wood is put in a vice after being marked out, and a square can be put on it when the brace is in position to ensure a correct cut.

It may be found better, too, to stand at the end of the bench and work, instead of at the side.

Before this boring can be done, however, it is essential to mark out the wood so the dowel holes will come in their proper place directly opposite each other.

Joints

A good joint can only be made, of course, by accurately marking, and it must be done with square and gauge to ensure this. The dowel is driven in the centre of the thickness of the wood, and a line must, therefore, be marked down first to indicate this.

Get a marking gauge and see the point of it comes half way across the wood. It is best to put the two pieces in a vice and mark the position of the dowelling with pencil with a square, as shown in Fig. 5. Then take the marking gauge and cross these lines to indicate the exact position where the centre of the bit will enter when the hole is to be bored for the dowelling, see Fig. 6.

Having got the positions, the next thing is to bore the holes, as already explained. The dowel will sink about ½in. into each piece, and it is advisable to have some form of knowing the depth when the brace and bit is used.

Height Gauge

It can easily be done by tying a piece of cotton round the bit at the required height. Or a small elastic band can be put round, or the number of turns of the bit counted to carry it to the right depth. It is advisable to carry the bit to a little lower than the actual depth of the dowel in order to clear away any roughness.

The top of the hole, too, should be very slightly countersunk. The depth of the hole in each part will, of course, be just over half the length of the actual dowel. The ends of this dowel can be slightly chamfered. Dip the end of the dowel in glue or coat it over and then tap it firmly into the holes of one piece. The other portion of the dowel is glued over and first piece of wood put over into its place.

Not only must the dowel itself be glued, of course, but the whole face of the wood which is meeting. The two parts are held as shown at Fig. 7.

The glue is then brushed on and the two parts put together. If possible put the completed joint in a vice or tie tightly with string until the glue has hardened.

Those who do a good deal of dowelling may find it worth getting a little thing called a marking pin, which enables the marking to be done easily and accurately. This little tool, Fig. 8, is like a drawing pin with a point projecting from both sides. Thus, when the position of the dowel is marked on one piece of wood, the pin is pressed into it.

The second piece of wood is then held in place and, by pressing down on to the other piece, a true position is indicated by the second point of the pin, as clearly indicated in Fig. 8.

The whole process of dowelling is quite a simple job for the amateur to undertake, but the principal points to remember are, to mark out the wood carefully for the position of the dowels, to bore the holes straight and true, and to use good and well seasoned wood.

A STAMP COLLECTOR'S ALPHABET

A collection of terms which every philatelist should understand.

A *AERO-PHILATELY. The study and collection of Air stamps.*

B *BISECT. A stamp cut in half for each part to be used at half value.*

C *CACHET. A mark impressed on a card or envelope to show the special circumstances in which it was posted, e.g., on some important exploration expedition.*

D *DEMONETISED. A term applied to obsolete stamps no longer valid for use in the post.*

E *EXPERTISE. The expression of an opinion regarding the genuineness or value of a stamp by a Philatelitic expert.*

F *FISCAL PHILATELY. The collection of stamps used for revenue other than postage.*

G *GOVERNMENT IMITATIONS. Copies of obsolete stamps made by government authority to provide specimens for exhibitions, etc., when the original materials and dies are no longer available.*

H *HINGE. A small piece of gummed paper used for mounting stamps in albums.*

I *INVERTED. Upside down. (Stamps printed in two impressions sometimes have the centre Inverted as compared to the rest of the design).*

J *JUBILEE LINES. Lines of colour found round the edges of sheets of many British and Colonial stamps.*

K *KEY PLATE. A printing plate used to provide the common design for a series of stamps, blank spaces being left for the addition of figures and lettering.*

L *LOCALS. Stamps whose franking power is limited to a particular district or route.*

M *MIRROR PRINT. A type of error in which the design on a stamp is printed in reverse, as though seen in a mirror.*

N *NEWSPAPER STAMPS. Stamps issued in some countries for use on newspaper mail only.*

O *ODONTOMETRE. A gauge for measuring perforations.*

P *POCHETTES. Transparent envelopes made to hold one stamp each.*

Q *QUARTZ LAMP. A violet ray lamp used to detect alterations on stamps.*

R *ROULETTING. A form of perforation which is merely pricked in the paper without punching the holes out.*

S *SUNDAY LABEL. A small label at the base of some Belgian stamps giving instructions not to deliver on Sunday.*

T *TÊTE BÊCHE. An unsevered pair of stamps from a sheet in which one is printed upside down as compared to the other.*

U *U.P.U. Abbreviation for 'Universal Postal Union' which regulates international relationships between Postal authorities of the world.*

V *VARIETY. A stamp containing some small variation from normal not sufficiently important to be classed as an 'Error'.*

W *WATERMARK DETECTOR. A black slab or tray for examining watermarks with the application of benzine.*

X *XLOL. A spirit used for mixing photogravure inks used in printing some stamps.*

Y *YIN YANK. An oriental symbol found in stamps of Korea and Mongolia.*

Z *ZERO STAMPS. Spanish stamps numbered at the back 000,000.*

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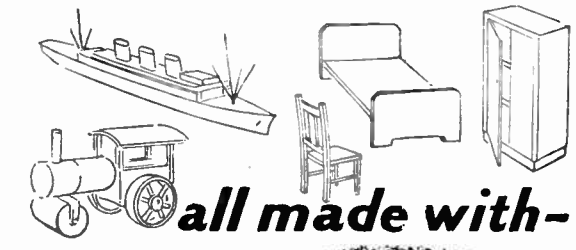

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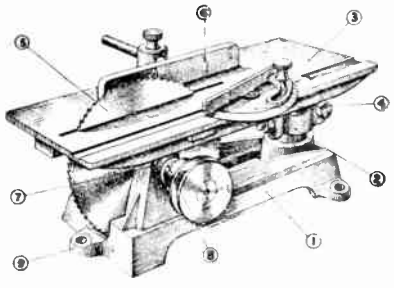

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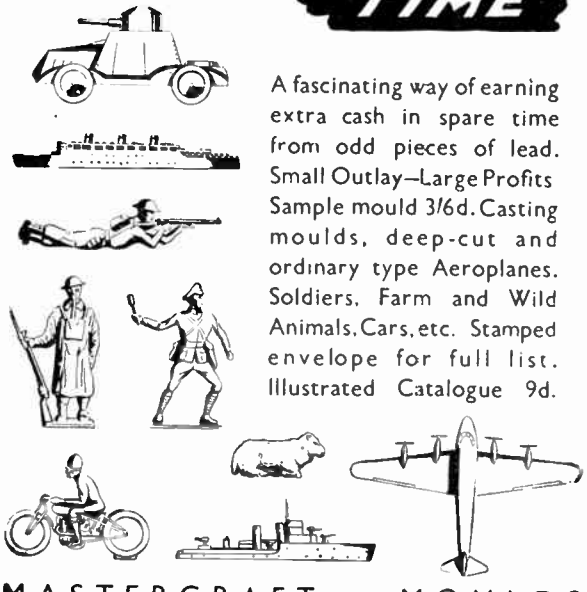

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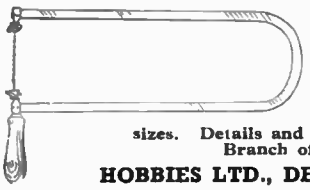

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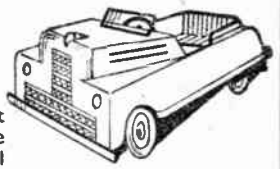

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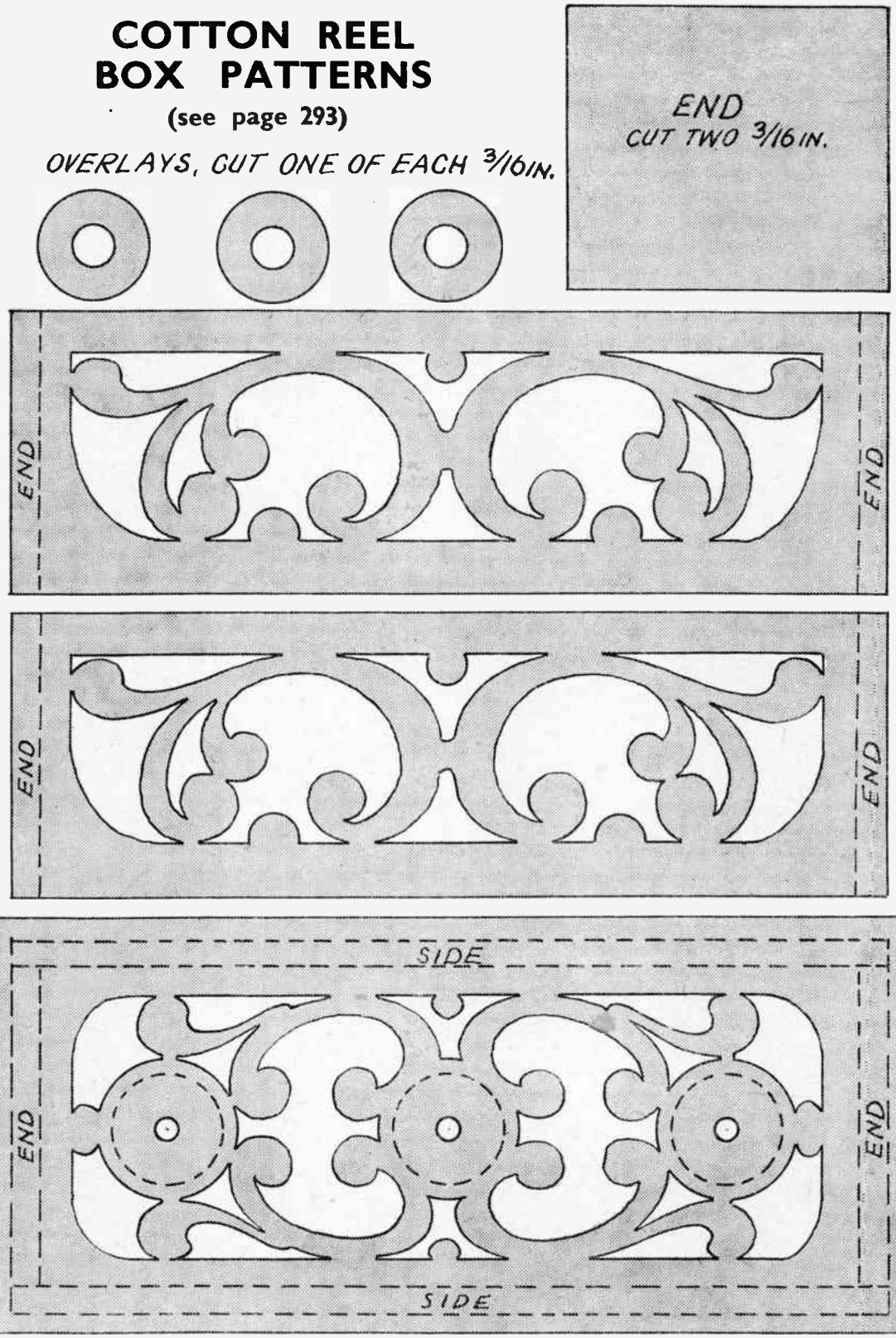

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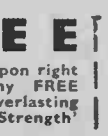

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Hobbies WEEKLY

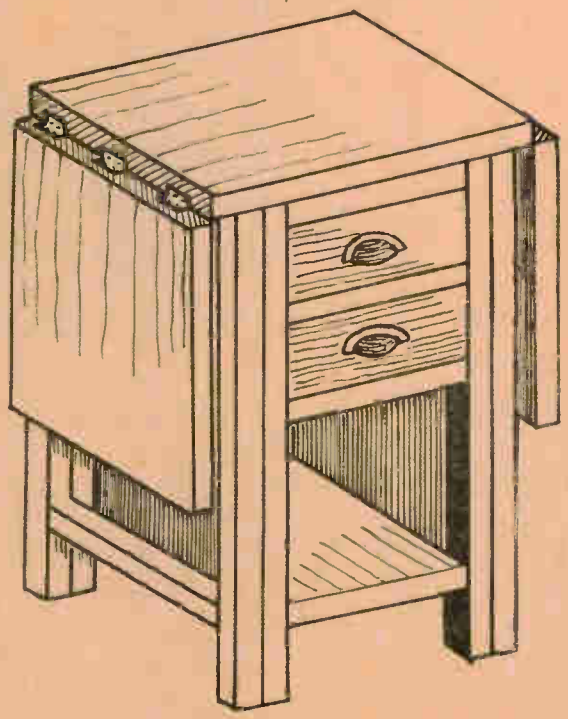
CONTENTS

February 14th, 1951 Price Fourpence Vol. III No. 2885

A WORKBENCH AND EXTENDING KITCHEN TABLE

THE kitchen table illustrated here is a really useful item of equipment. The two drawers are of fair size and can be used for holding cutlery and the small accessories needed in the kitchen, while the open cupboard beneath them provides ample storage space for pots and pans. In addition, the table top can be increased in size by means of two extra leaves which are supported on simple swinging frameworks.

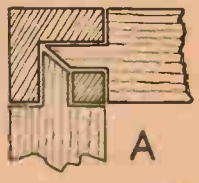
The four legs of the main framework measure 2ft. 6ins. high and 1½ins. square. Two slots and four mortises are cut on two adjacent faces of each leg, all slots and mortises being 1½ins. long and ¼in. wide, being set in the centre of the leg.



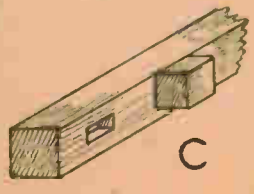
The bottom edges of the slots are at 1½ins. from the top of the legs, while the mortises have their lower edges at 7ins. and 1ft. 1½ins. from the top of the legs; all slots and mortises are worked to a depth of 1in. so they meet in the thickness of the wood.

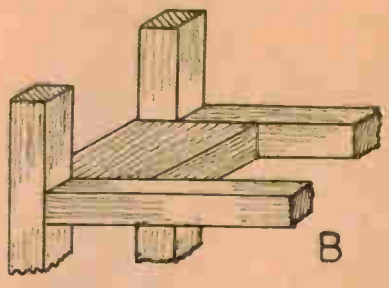
Before the rails can be prepared an additional mortise must be cut on each leg. This is to take one end of the bottom side rail which supports the lower shelf, and must be cut on the appropriate face of each leg. As before, the mortise is 1½ins. long, ¼in. wide and 1in. deep, and has its bottom end at 4ins. from the bottom of the leg.

Back and front rails are all 1ft. 2ins. long and 1½ins. square. Six such rails will be needed, and each has a 1in. long by ¼in. wide tenon saw cut from each end. The extreme end of each tenon should be sawn across at a mitre angle so that the rails can meet correctly in the thickness of the leg (see drawing A), and two slots should be cut on the inside face of the top back and top front rails. These slots are 1in. long, ¼in. wide and ⅜in. deep (having their top edge at ¼in. from the top of the rail) and are spaced out at equal distances apart between the shoulders of the rail.



The back and front frameworks can then be glued and cramped up, being left under pressure from





the cramp until the glue has set hard.

The top and bottom side rails are 1ft. 11ins. long, 1½ins. wide and 1¼ins. thick. They are prepared with a tenon at each end so that they fit flush with the inside faces of the legs, while the top rail has three slots (similar to those on the back and front rails) cut on its inside face.

The two remaining rails on each side are 1ft. 11ins. long, 1½ins. thick and 3½ins. wide. These have a tenon 1in. long and ½in. wide sawn out of each end, so that when assembled into the framework, the outer edges of these rails will be flush with the outer edges of the top and bottom rails, while the inside edges of them project inside the carcase to form drawer runners. Drawing (B) shows how these rails project inside the framework.

When these side rails have been completed the main carcase can be glued and cramped together.

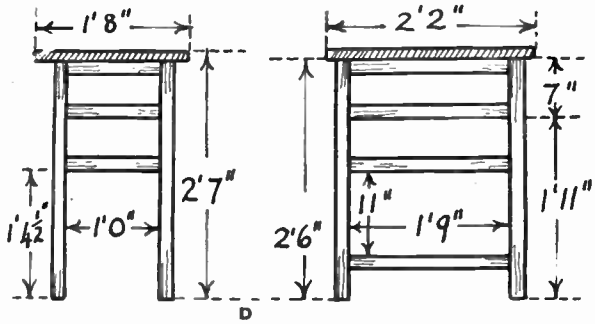
Plywood or hardboard can be used as desired for filling in the back and sides. For the sides a 1ft. 9ins. wide strip fitting level with the top of the top rail and the bottom of the bottom rail will be needed, while at the back the plywood fits flush with the outer edges of the legs.

Securing the Top

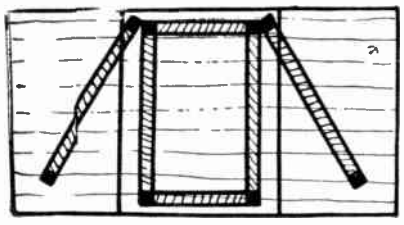
To secure the table top ten 'thumb-pieces' will be needed. All thumb-pieces are 1in. long and deep by 1½ins. wide, with a rebate ⅜in. wide by ½in. deep cut from the top edge. Each thumb-piece can then be glued into a slot so that its top edge is flush with the top of the rail (drawing C).

The actual table top measures 1ft. 8ins. long by 2ft. 2ins. wide and 1in. thick, boards being glue-jointed along the edges as necessary to get the required width. This table top is placed centrally over the main framework and is held in position by screws that pass up through the thumb-pieces.

The bottom shelf is the next item to be fixed, and is simply cut to size and screwed down on top of the bottom rails; a ratchet brace and screwdriver bit will be found very useful for fixing this. Drawing (D) shows the main dimensions of the carcase at this stage.



D


E

Wood 1½ins. square is used throughout for the two swinging frameworks. Each framework has four members, two legs 2ft. 6ins. high and two rails 1ft. 11ins. long which are sunk into 1in. deep mortises on the legs; the position of these rails correspond to those of the top and bottom rails on the main carcase.

When completed, the frameworks are hinged to the back legs of the main carcase so that they can swing outwards. The extension leaves (each 1ft. 3ins. long, 2ft. 2ins. wide and 1in. thick) are then hinged to the ends of the fixed top. Drawing (E) gives a plan of the assembled table showing the frames swung open to support the extra leaves.

When making the two drawers a suitable panel should be sawn and planed to make a good fit to the drawer opening. This is then used as the drawer front, the drawer itself being assembled with ordinary butt joints. To prevent end-grain showing on the front of the drawers the front edge of the drawer sides can be fitted into rebates cut on the inside of the drawer front. Glue and nails can be used for assembling the drawers, all nails being punched well home and made good with plastic wood. A brass handle can be fitted to the front of each drawer.

After a thorough glasspapering the legs and framework can be stained or painted, but the table top and leaves should be left untreated. (346)

Some odd pieces of material can make an

ARTISTIC CANDLE HOLDER

A PAIR of artistic candle holders make a very acceptable present, and the design illustrated by Fig. 1, is well worth making. The holders

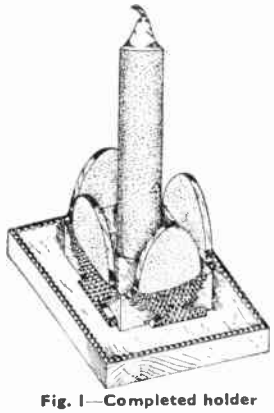


Fig. 1—Completed holder

look quite attractive if the acorns are nicely coloured. The design is simple and lends itself to quick production, and gives one an opportunity of using up some of the smaller pieces of wood which may be lying around. The method of making the holders is described in the following manner.

The base is made in two parts and this is indicated in view (A) Fig. 2. From good sound pieces of wood ½in. thick cut the base 3½ins. square, as indicated. The top part of the base which holds the candle is made in wood ¾in. thick, and cut this 2ins. square, as indicated. In the middle of this piece, carefully bore a hole 1in. in diameter. When these parts have been made and well smoothed up, fix the 2in. top part in the middle of the base with glue.

Details of the acorn sides, four of which are required for each holder, are indicated in view (B) Fig. 2. Divide pieces of $\frac{3}{16}$in. sound wood 2ins. square into ½in. squares, as indicated, and then draw the outline of the acorn from the illustration. Carefully cut the acorns out with the fret-saw, and smooth up the surface, taking particular care with the edges.

The acorns when made are carefully fixed in position with glue on the sides of the top portion of the base, as clearly seen in Fig. 1. Strips of $\frac{3}{16}$in. half-round beading are glued on the edges of the base, as shown, which adds to the artistic nature of the object.

The article is nicely finished off by staining the base, with the top portion holding the candle coloured with white or cream enamel, and the acorns coloured with green enamel. Use light green for the acorn and two shades of darker green for the acorn cup. (348)

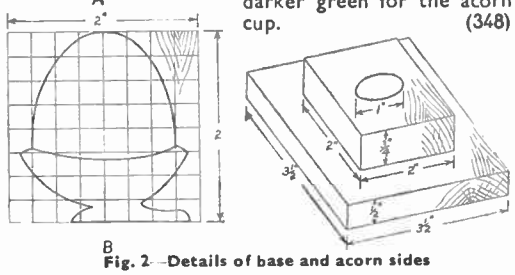
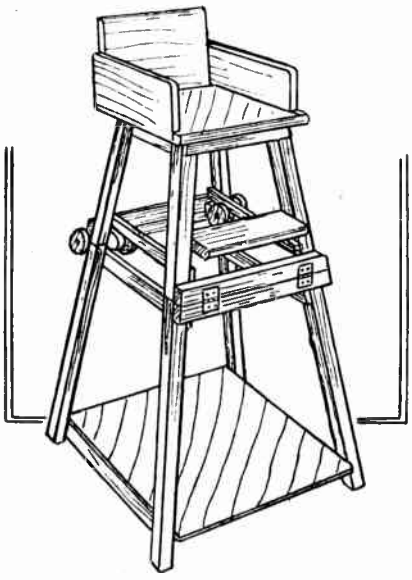


Fig. 2—Details of base and acorn sides

Any little lady would be delighted with this convertible

DOLL'S TALL CHAIR



THIS little model would make a delightful present for a child. It is a reduced size chair of the popular convertible type, the lower portion swinging upwards to form a play table for the baby. Its dimensions are about right for the average size doll.

A front and side view are given in Fig. 1, with such dimensions as are necessary. The lengths of most parts are given in the cutting list, and need not be repeated here. Having cut the four legs, cut the top and bottom horizontal bars.

Glue and nail these bars across the legs, as in the side view. This will make the necessary splay for the chair's stability. Then saw off the ends of the bars to the slope of the legs. Note here that these bars are to be fixed on what will be the inside face of the legs.

The middle bars are then fitted across at the distances shown. The lengths of these, given in the cutting list, are approximate, and should be measured across the legs for exactitude. Trim off any projections level with the outer slope. These pairs of legs are now to be joined together to complete the stand, and a careful survey should first be taken of the front view in the diagrams.

The top and bottom bars are fitted similarly to the side ones, but note that the lower bar, seen in the drawing, goes across the rear of the stand only, no front one being required. Cut the play table from plywood, and nail and glue to the side and bottom rear rails. Here again, it being impossible to supply really exact sizes, actual measurements across and along the bars should be taken beforehand.

The table should extend beyond the front legs by $\frac{3}{8}$in. and be level with the side and rear bars to which it is to be nailed. The table will keep the front legs at their correct distance apart, but it is a helpful plan to nail a temporary bar across before fitting the play table, to better ensure the front legs splaying equal to those at the rear.

The bar can be removed directly the table is fixed, and if the nails used to keep it in position are driven into the ends of the side bars, instead of into the legs, the holes will be inconspicuous afterwards.

Glue and nail the front middle bar across, then the rear one. The latter, it will be noticed, is double the thickness of the front one, and longer, so that it extends a little over the sides, as shown by the dotted lines. The legs should now be trimmed at their bottom ends to bed flat to the floor.

Run a pencil line across the centre of both front and rear middle bars, and extend these lines across the sides of the legs as well. With a tenon saw, divide both bars and saw across the legs to divide the stand into two portions. The sawn edges here should be well glasspapered.

Remove the upper half of the stand, and to the rear legs of it, at the bottom, fix a pair of wood supports, shown at (A) in Fig. 2, to which the rear wheels can be fitted. These supports are cut 1in. wide and $\frac{3}{4}$in. thick, trimmed at their rear ends to the slope of the bar (rear middle one) and planed on their inside faces to a 10 degree bevel, as seen in the diagram.

Round the front ends of these supports, and at $\frac{1}{2}$in. from here, bore a small hole with a bradawl for the screws, which will fix the wheels in position. Fasten each support with glue and a single screw to its respective leg, and drive a couple of nails through the rear bar into them as well.

A sound secure fixing should result, with the inside faces of the supports truly vertical, instead of sloping. The extended ends of the rear bar can now be sawn off. The other half of this bar, now attached to the lower half of the stand, should be left with its ends extended, as fixed, and to the ends of it, the front pair of wheels will be fitted later.

Hinge the two parts of the stand together with a pair of 1in. butt hinges screwed to the front middle bar. Turn round, and hold the rear middle bars together with a hook fastener, going under a screw head, as in detail sketch (B). A footboard of $\frac{1}{2}$in. by 2in. wood can be nailed across the legs at the front, at any convenient distance down from the top, somewhere about where shown in Fig. 1. A good glasspapering all over will be necessary now to remove roughness.

The seat, Fig. 3 (plan and side view) can be made from $\frac{1}{2}$in. wood to the dimensions given. Round the front edge. Cut away the side edges of the seat from $\frac{1}{2}$in. at the front to the back for the sides to sit in. Cut these to the length given in the cutting list and trim the rear ends to a slope, the bottom length of the sides being then $6\frac{1}{2}$ins. Nail these in place, then cut and fit the back rest in.

CUTTING LIST

Legs (4)—1ft. 6ins. by $\frac{3}{4}$in. by $\frac{3}{4}$in.
Top bars (4)—$6\frac{1}{2}$ins. by 1in. by $\frac{3}{8}$in.
Bottom bars (3)—$11\frac{3}{4}$ins. by 1in. by $\frac{3}{8}$in.
*Front middle bar—$8\frac{1}{2}$ins. by 2ins. by $\frac{3}{4}$in.
*Side middle bars (4)—$8\frac{1}{2}$ins. by 1in. by $\frac{3}{8}$in.
*Rear middle bar—$9\frac{1}{2}$ins. by 2ins. by $\frac{3}{4}$in.
*Play table—$12\frac{1}{2}$ins. by $9\frac{3}{4}$ins. by $\frac{1}{4}$in.
Chair seat—7ins. by 8ins. by $\frac{1}{2}$in.
Chair sides (2)—7ins. by $4\frac{1}{2}$ins. by $\frac{3}{4}$in.
Chair back—$7\frac{1}{2}$ins. by 6ins. by $\frac{1}{2}$in.
*Approximate lengths only. Footboard and wheel supports from scrap wood.

FITTINGS

1 pair 1in. butt hinges, 1 hook fastener, and 4 wheels (wood, 2ins.).

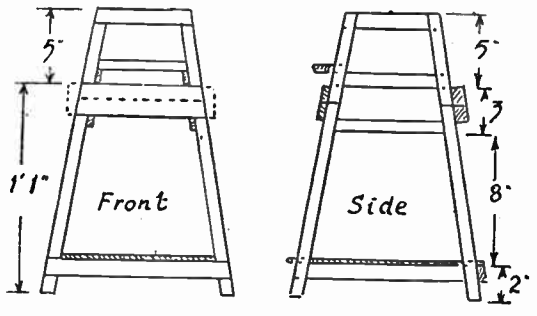


Fig. 1—Front and side view

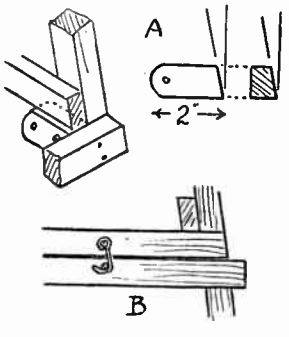


Fig. 2—Joints and fixing

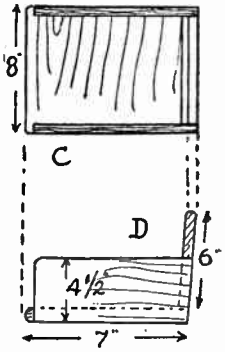
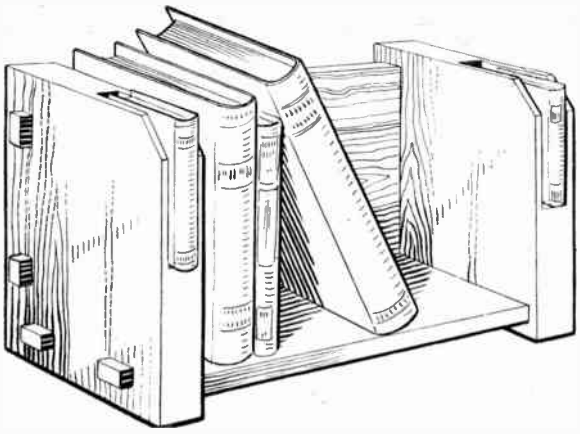


Fig. 3—The seat

Notice the small books standing in the ends of this NOVEL BOOKSTAND



EVERYBODY who uses a number of books needs some method of keeping the few that are in current use tidy. These few books are almost certain to include a dictionary and a ready-reckoner. There are on the market today, some very convenient and reliable pocket dictionaries and ready-reckoners. As they are of pocket size they are often mislaid under other books.

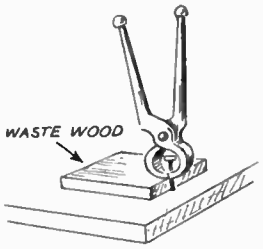
The bookstand shown here makes special provision for these small, but invaluable, volumes in its ends. It is quite easy to make and when finished it will look attractive and be useful on any desk or side table at home.

Materials

The dimensions of the pieces of wood required can be seen on the diagrams. Oak is the most satisfactory wood to use, but there is no reason why any wood free from too many knots should not be used. The outsides of the ends may present some difficulty as they are only ¼in. thick. Plywood could be used but it would tend to make the stand look cheap.

Prevents Damage

A PIECE of waste wood placed beneath the pincers when withdrawing a nail, prevents the wood from getting bruised and marked, as shown in the illustration.



The aim should be to make anyone looking at it think that the ends are made from one piece of wood. Four pieces of thin felt to cover the bottoms of the ends and the backs and bottoms of the pocket-books' cubby-holes will be required.

The finish of the bookstand is a matter of personal taste. It is best, however, to avoid varnish stains, as they do not give a very durable finish. A pleasant serviceable surface can be made by staining the wood and then polishing it with white furniture polish. Light and dark oak stains are the best for general use.

Construction

The centres of the two ends should be cut out first. Ensure they are both the same size and that the edges are square. They should be ¼in. thicker than the pocket-books; ⅞in. is usually suitable. Using a strong glue, stick a strip of felt along the two edges of the cut-out portion.

Next cut out the outsides of the ends from the thin wood. Cut them in pairs so they match perfectly and give the outer edges a slight chamfer with glasspaper. Stain inside the top front corner of each piece now, as this will be difficult when it is assembled.

The ends must now be stuck together like a sandwich with thin layers of strong wood glue. The thick centre piece is between the two thinner pieces so the rebate cut in it makes the little recess for the book. The back and bottom of this recess have already been lined with felt. Clamp the two ends and put them aside to dry under pressure.

Now cut the back and bottom of the stand from ½in. wood. Use the exact measurements shown in the diagrams, being particularly careful with the tenons. Glasspaper them smooth and then put a chamfer on all four edges of the end of each tenon and the top of the back and the front of the bottom. Drill a hole ⅜in. diameter ½in. from the end of each tenon in a central position. These holes will be for the pegs that hold the tenons.

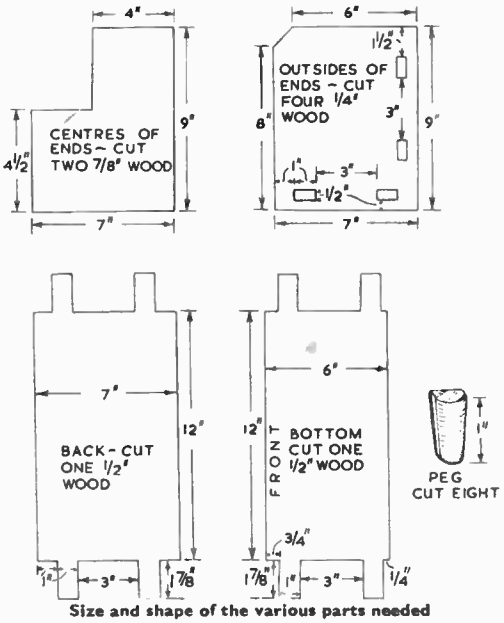
The positions for the mortises on the ends should be marked in pencil. Each hole will be ½in. by 1in. To make the job easier, drill two ½in. diameter holes inside the pencil lines and clean the mortises out with a chisel. The bookstand can now be assembled to make sure that the joints fit well.

Eight small pegs will be required. These should be cut out as shown in the diagram, bearing in mind that they have to fill a semi-circular hole ⅜in. wide.

Assembling the Bookstand

It will be very much easier to stain the stand before it is assembled than afterwards. After staining, leave the parts to dry thoroughly and then fit them together again to check that the joints are tight and that the bookstand is level and does not wobble.

Before assembling finally, a little glue may be put round the bases of the tenons and on the ends of the back and bottom between the tenons. Ensure this does not run out of the joints on to the wood.



Size and shape of the various parts needed

Put a smear of glue on the backs of the pegs and inside the holes and then press them home by hand.

Use a piece of scrap wood as a punch and tap the tops of the pegs gently with a hammer until they are quite firm. Allow them to dry before handling the stand. Cover the bottoms of the ends with felt and trim it neatly. Finally polish the whole job with white furniture polish.

This bookstand complete with a pocket-dictionary and ready-reckoner, which cost two shillings and sixpence each, will make an ideal Christmas present for anyone who reads and writes much. (318)

The housewife will be delighted with these KITCHEN FITMENTS

NOW there is an ample supply of beadings and hardboard the handyman can amuse himself by making all sorts of kitchen fitments to augment or improve the existing ones. A little planning on modern lines will enable him to make a very super kitchen at nominal expense.

If replanning altogether then study the sketch at Fig. 1, which gives you some measurements at which to work. Design the cupboards so that the broom and feet have a clearance as shown. Note the best height at which to work which is 3ft. The 3in. deep well rounded board at the back saves bits of food and other materials from going down behind. This is often the cause of an offensive smell in the kitchen.

In the upper part of the sketch is shown a unit which, by its design gives you much better space for goods in continual service, cups and saucers at the bottom, tea plates and bowls centre and larger plates at the top. Here again (at Fig. 2) note the height at which to carry it. Space above this is awkward and might be filled in as a cupboard to hold larger dishes and items not so often in use. Obviously, to get them out you need a small step ladder or chair and, therefore, this rules out the question of general storage.

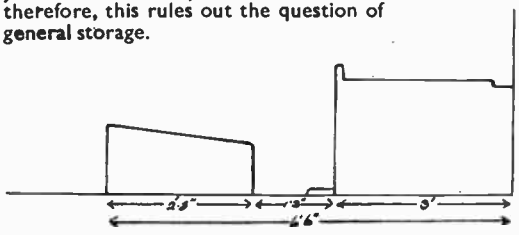


Fig. 1—Suitable spacing

In planning the kitchen fitments consider the position of the window, door and also if you have a serving hatch. Work all fittings in to give every comfort in working.

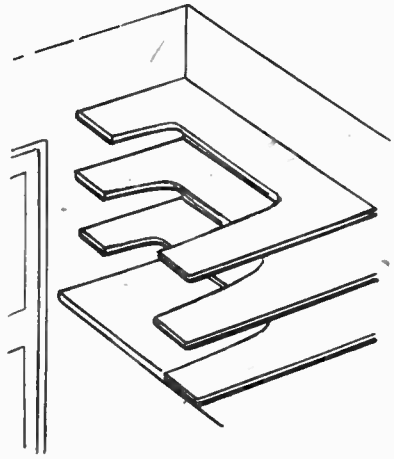


Fig. 3—Shaped shelving

Nearly all housewives have a complaint about their food cupboard. At the best of times and in many houses it is small and the shelves unsuitable. Provided the shape is right the shelves suggested here at Fig. 3 should solve many of the storage problems.

As you will see the shelves are specially designed to use up all the available space all round and not overhang and blot out the light. One can also get to them quite easily. These should be made in hardboard and the battens along the wall should be carried right along the side and the two ends. This will allow ample support for the shelf sections.

If in doubt about the stress and strain then screw in 1in. square battens along the edges at the front. Heavy and tall jars and items should be kept at the back and the smaller ones in the front. This will prevent them being hidden up as they are on the older type of shelf.

In designing the working table for the kitchen it is a good idea to provide a space for the spare tea trays, as these are often left about and damaged. As shown at Fig. 4 the table is extended over the outer and upright panel and a step with an upright is then fitted along. Three ½in. dowel rods can then be set in the top and extended to the base.

In older types of kitchens we often have an awkward shaped corner, perhaps, where the copper once stood and has now been removed. This space will make an ideal small dresser for cups, saucers and plates.

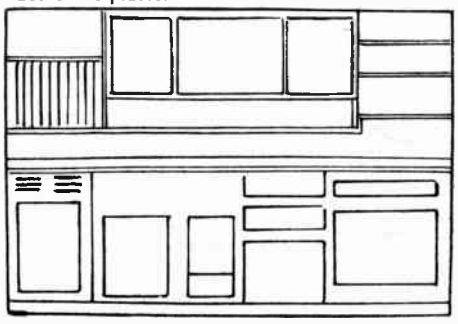


Fig. 6—A one-wall unit

As shown in the sketch at Fig. 5 it can have four shelves and these can be made from floor board screwed together with 1in. quartering underneath. Battens of 2in. deep wood by 1in. wide should be fitted to the wall first. A deep edging about 3ins. will help to finish it off and will take off the unsightly projection of the wall.

If you are able to cater for the housewife by rebuilding the whole of the fitments on one wall you can do this by a planned unit as shown (see Fig. 6). Here you have the most compact and complete set of fitments it is possible to get in a space of, say, 6ft. high by 6ft. long. It can be built in hardboard with the drawers in light white wood.

Note that provision is made for practically everything. The writer has seen this fitting made by a home handyman who has himself been amazed at the space he was able to save. The addition of the garbage section is an asset and this should be lined with zinc or tin for the sake of cleanliness.

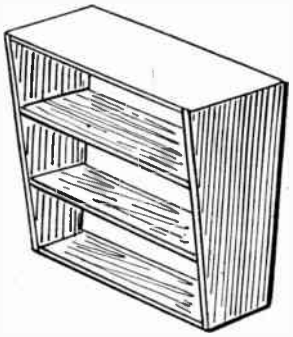


Fig. 2—A handy shelf unit

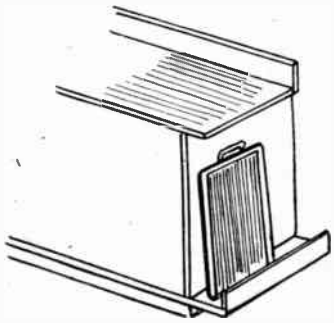


Fig. 4—A tray holder

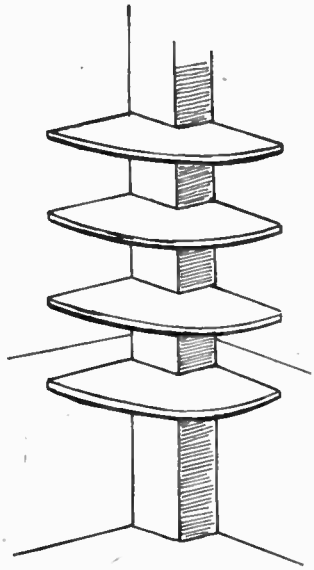
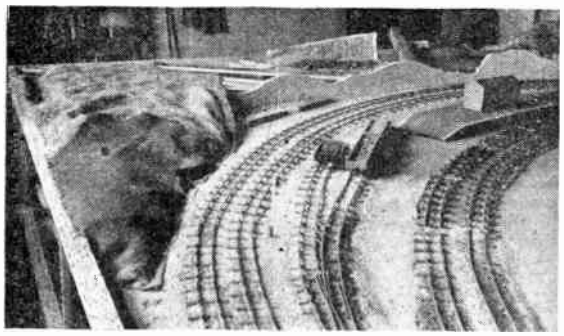


Fig. 5—Corner benefits

Elements of scenic effects in attractive
MODEL RAILWAY WORK



Hill scenery in course of construction with sacking and wood

NO matter how perfect a model railway may be from a purely 'railway' angle, it can always be made more interesting and imposing—particularly to the casually interested onlooker, by the judicious addition of scenery and architectural features.

The making of 'hills' and 'valleys', embankments and cuttings, as well as trees and hedgerows is not by any means such a difficult task as might be imagined, being well within the capability of the average model railway enthusiast. Moreover, the materials needed are neither scarce nor costly, and the tools used are of the very simplest character.

Framework

The basis of all scenic modelling is the construction of a very rough wooden framework from laths or scrapwood to the very approximate contours of the 'ground' being modelled, but as it is extremely difficult to cut down into the railway baseboard to produce actual valleys with embankments crossing them, this effect has to be produced by the illusion created by the building up of the 'hills' at the front and rear of the railway tracks.

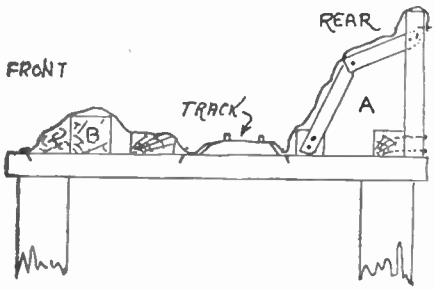


Fig. 1—Cross section of single track layout

Cuttings

In Fig. 1 is shown the cross section through a single-track line running in a cutting. It will be seen that by building a rough framework at (A), and the laying of long pieces of 2ins. by 1in., and 2ins. by 2ins. (seen in end section), and afterwards covering these with paper (treated as will be described), the track immediately appears as though it were in a deep cutting. This illusion is largely created by the steep cutting wall at the rear of the rails.

Similarly, in Fig. 2, the effect of an embankment can be produced by slightly raising the track and building skeletons as shown, arranging a gently-sloping 'hill' to gently merge into the back-cloth scenery, thus completing the illusion of distance.

Canals and Boats

The inclusion of a canal or river where shown, with barges or boats, will break an ugly gap which can exist very easily between the near and middle-distance.

The angle of the upswept rear 'hill' should not be made greater than about 30 degrees with the horizontal, otherwise the 'hill' will refuse to blend smoothly into the painted vertical backcloth. By using the angle shown—or less, according to the width of the railway baseboard, the eye, when viewing the scene in its entirety from the point (X), will readily accept the tilted back portion of the layout as if it were flat.

This illusion will be increased by the fact that the rear edge of the embankment (Y) will cut across the river and barges, and thus give a very pronounced stereoscopic effect which will throw the railway track and river traffic into strong perspective and relief. This is just the effect we want.

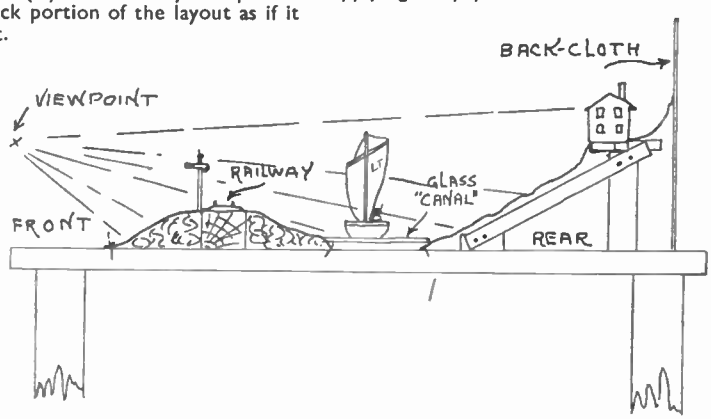


Fig. 2—Embankment effect with 'canal'—all shown in cross section

Making 'Hills'

The covering material most generally used in professional circles is that generally known as papier-mâché, which is quickly and most cheaply produced in the following manner:—

The Mixture

Obtain a large saucepan, and tear up into it old newspapers or any other paper not of the 'shiny' variety, until it is three-quarters filled. Then add hot water until the pan is half-full of a mush of paper and water, and boil gently for about four hours, at the end of which time the paper will be found to have disappeared, it being replaced with a mass resembling porridge. If all signs of paper have not disappeared, continue to boil until all is reduced to a perfect pulp.

The pan should now be removed from the fire and ordinary glue or flour paste added in the proportion of one part glue or paste to one part of paper pulp, stirring well during the mixing. Size will do instead of weak glue or paste.

When all is well mixed, add sufficient plaster of Paris to make a good 'stodgy' paste of the whole mass, of about the consistency of mortar.

Application

This mixture should be immediately applied to the brown paper-covered wooden frameworks, and must not be worked dry, otherwise it will not adhere to the woodwork. If any difficulty is experienced in this direction, the offending part of the framework should be well moistened with some of the liquor from the saucepan before applying the papier-mâché.

Another Method

Another good method of modelling is that of dipping sheets of brown paper into a strong solution of size, and dropping them, whilst wet, over the wooden framework already made. Whilst the sheets are wet they may be moulded into any desired contour, but when thoroughly dry they may be painted to represent earth, grass or rocks, as will be explained in the next article in this series.

(To be Continued)

Better reproduction is obtained by the correct

AERIAL INSTALLATIONS

A RADIO receiver can only reproduce the signals picked up by its aerial. In other words—a receiver is as good as its aerial. Years ago this was appreciated and high outdoor aerials were usual; today, receivers are so much more sensitive almost any odd length of wire will function and the user often fails to realise how results are being spoiled.

With a poor aerial distant stations will be almost inaudible; the signal pick-up from nearer stations will also be reduced. As a result the receiver volume control will have to be turned more towards maximum setting, which will cause an increase in background noises.

Up to date receivers with A.V.C. (automatic volume control) require a reasonably strong signal. Without it the A.V.C. cannot function properly and the programme will 'fade' or fluctuate in strength. In other cases, the use of an efficient aerial may make all the difference in bringing various desired stations up to good strength, or in enabling them to over-ride crackling and other background noises.

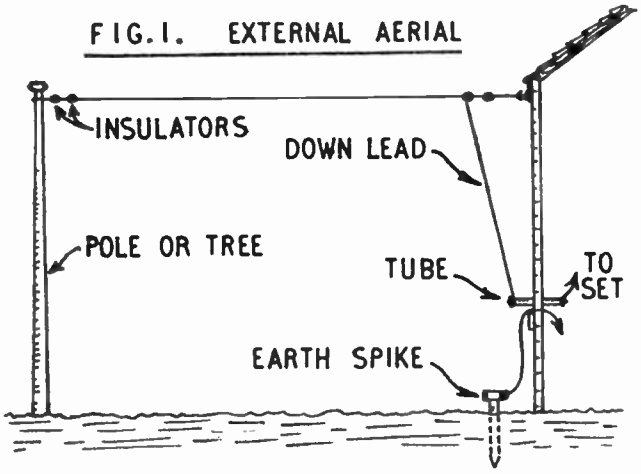
Outdoor Aerials

Though efficient indoor aerials can be used an outdoor wire well clear of surrounding buildings and as high as practicable provides the best signal pick-up. A typical aerial of this type is illustrated in Fig. 1 and it is usually possible to erect it somewhere between the house and a convenient tree or pole. The length of the horizontal portion depends largely on surroundings, but something between about 30ft. to 50ft. is average. Even a much shorter length will give excellent results.

Proper aerial wire is best. This is usually copper, and referred to as 7/32 S.W.G. (which means there are seven strands of 32 S.W.G. wire). It may be bare or covered and it is best to take it in one unbroken length from the insulator remote from the house right to the lead-in tube or receiver. Two china egg insulators are used at each end, as shown, and the aerial passes through one near the house so that the down lead is an unbroken section of the aerial itself.

Where the aerial passes through the insulators it should be tied or bound with thin wire. Cord or wire may be used between the adjacent insulators, wire being more lasting. Further lengths of cord or wire support the whole from pole to house.

FIG. 1. EXTERNAL AERIAL



A Chimney Aerial

Where there is little or no garden space but the best aerial permissible in the circumstances is required, the form shown in Fig. 2 can be used. Such aerial rods may be purchased or devised from materials to hand. The rod is secured in an insulated fixture, a metal bracket being provided for mounting. A further bracket with an insulated lead-through fitment is used to keep the down lead well away from the roof and wall.

As with Fig. 1, the down lead should be at least 1ft. away from the building, if possible, for most of its length. Actually, this lead contributes materially to the strength of the signal pick-up, but if it is poorly insulated or near brickwork and other earthed objects it will not be able to function in this way. Instead, actual loss of volume may be caused.

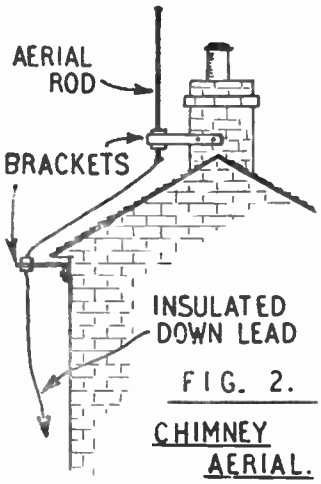


FIG. 2. CHIMNEY AERIAL.

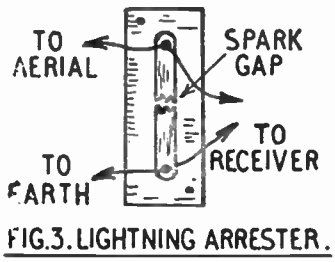


FIG. 3. LIGHTNING ARRESTER.

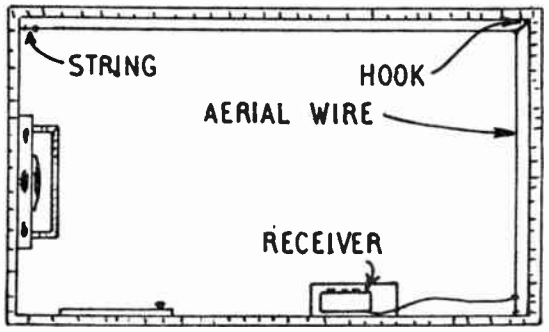


FIG. 4. AN INDOOR AERIAL

Lead-In and Earth

Proper insulated lead-in tubes are obtainable to bring the aerial lead into the house. Alternatively, if a small hole (say, ¼in. diameter) can be drilled through a wooden part of the window-casement the down lead may be carried through this and right to the receiver.

Insulating tape or a short length of rubber tubing can be added to prevent rain running down the outside wire into the hole. Or the down lead may be passed between window and casement. Usually this will not prevent the window being closed and results will be satisfactory if rubber-covered wire is used.

For the earth lead bare copper wire can be used. It should go to a metal object in the earth itself outside the house. A damp spot is preferable and a piece of bare wire netting or other metal object buried in the ground can be used if a proper copper tube or spike is not available. Good contact is desirable between 'earth' and lead, soldering

(Continued foot of page 312)

Make your garden gay by introducing and COLOURING A PATH

IT is pretty safe to say that most modern handymen can use cement, either plain or worked up into a concrete of one sort or another. Indeed, it has amazed the writer to note the really big number of people who now-a-days use it freely about their homes, making steps, paths, shed floors, grass edging and the like.

Most workers seem to use the ubiquitous plaster in its original grey form, so we get everywhere grey steps, grey paths and grey floors. There is really no need for the monotony, however, for cements and concretes can be coloured to almost any tint desired.

Seaside resorts have been making a great effort recently to get away from the continuous grey and at some places whole areas of promenade and paths over which holiday-makers surge are laid in pleasant eye-resting greens.

For the Amateur

Now there is not the least reason why the amateur path, step and floor layer should not follow suit and have his paths, steps and floors to some definite colour scheme, for colouring concretes and cements is particularly easy.

As but the surface of the items are seen, only the top layers to a depth of about 1in. need be coloured, the under layers being in the usual 'concrete grey'.

Colouring is effected by the adding of pigments, and these are mixed in with the cement (Portland) while it is dry. The intermingling must be particularly thorough, or streaky and patchy results may come about.

To ensure this perfect intermixing, the cement in the first case should be of a finely ground kind and secondly be sieved through a fine mesh to get rid of any tiny lumps that may have crept in. The pigment, too (which is bought in powder form), must be perfectly clear of 'bits'. Complete fusion is brought about best by mixing in a fairly deep container with a dry stick, the stirring being vigorous.

Pigments

Now as to the pigments to give various colours and the proportions to be used. Red is a very good colour for steps and is produced by adding 2lbs. of red oxide to a bucketful of cement. A green is secured by adding 10 parts of oxide of chromium to every 90 parts of Portland cement, while a nice blue comes by putting 14 parts of ultramarine pigment into 86 parts of cement.

A chocolate brown is only secured by mixing several colours. These are black oxide of manganese (6 parts), red oxide of iron (4 parts) and black oxide of iron (2 parts), all being added to 88 parts of the cement. Yellow as a finish is given by the simple addition of yellow ochre in the proportion of 12 parts to 88 parts.

Black paving finishes are seldom required unless for an edging or marking out of, say, a games court, but they can be obtained by mixing 10 parts of 'carbon black' or black oxide with 90 parts of cement.

Waterproofing

In all cases it is good to add a waterproofing ingredient to the cement and pigment, 3 parts of such an ingredient going to 100 parts of the mixture already secured. This waterproofing gives a stronger and better weather-resisting top surface.

As stated, the top layer only of any item need be coloured, the lower parts being just the usual mixtures. Thus, suppose one wished to lay a green path, the first thing would be to make a base concrete of 1 part cement, 2 parts sand and 4 parts of broken stone, taken down to lumps not bigger than 1in. across. These components are all churned up dry and water then slowly added till a workable paste is secured.

The 'bed' of the path must have been prepared first, of course, and then the concrete just made is laid on it to such a thickness that its upper surface is about 1in. below the final desired level. Tamp the mixture well down and strike a rough top level with a board used on edge.

Basework

This base must set well before putting on the top layer and twenty-four hours at least should elapse before continuing with the work. When all is ready, however, mix the coloured top dressing. This can basically be cement and sand, or for a path, cement, sand and very fine granite chippings. The final proportions work out to:

- 2½ parts of sand, or sand and chippings
- 1 part of Portland cement mixed with the green pigment and waterproofing ingredient.

Again mix dry and then slowly add water till a good workable consistency is obtained and apply this to the mixture already down, smoothing off the top carefully and cambering slightly if desired to give good drainage. Now leave everything to dry out and if all has gone well a path of a pure even green should result.

Colour Schemes

With regard to the colour scheme to adopt, much depends on the conditions and effect it is wished to secure. Red is a colour often adopted for single steps, but can be a bit fierce if used over a large area. Much better then for any expanse is a green or chocolate brown. Yellow is good for a floor inside a shed, as it gives lightness and a general sunny effect. As suggested, blacks should only be used for borders and other special positions where an 'outline' effect is desired. (342)

Aerial Installations—(*Continued from page* 311)

being best. As with the aerial, loose joints should be avoided because they may cause crackling.

Lightning Protection

Though there is little chance that lightning will strike an outdoor aerial, an arrester may be added as shown in Fig. 3. Here, there is a small gap between metal strips fixed to an insulated base, so that if lightning strikes the aerial, it jumps the gap and runs harmlessly to earth.

Aerials do not attract lightning; actually, an aerial such as that in Fig. 2, if fitted with an efficient arrester, will protect the house.

A similar result to that provided by the arrester may be obtained by connecting the aerial to the earth lead when tempest is about. Switches for this purpose can readily be obtained.

Indoor Aerials

Where an external aerial cannot be erected, or is considered undesirable, an efficient indoor arrangement is still possible. Fig. 4, which gives a plan view of a room, shows how such an aerial can be fitted.

For best results, the wire should be a few inches from the walls and thin string can be used for insulating the ends. Thin insulated wire in various colours can be obtained cheaply from the well-known popular stores and this is quite inconspicuous. The aerial should be as long as possible, but normally it is unwise to take it round more than two walls of the room or the closed loop formed will have curious directive properties. Arrange the wire fairly near the ceiling.

If there is a picture rail well insulated wire can be placed round in this, completely out of sight. If possible, keep the wire away from those sides of the room where mains wiring or other metal fitments are situated.

Finally, it is suggested that the present is the best time at which the listener can check over—and, perhaps, improve on the lines mentioned—his important (but often neglected) aerial system. (351)

A novelty for the home is this simple
KNITTING COMPANION

THE ball of wool that will keep rolling about is always a problem to the knitter. Besides the risk of getting dirty by rolling about on the floor there is the further danger of the ball getting very tangled up. There have been many gadgets on the market for holding a ball of wool so as to make the job of knitting easier.

The novel delivery box described here is an excellent example of such an article. It is a really attractive addition to the worktable, as well as being very efficient in its working. As will be seen from the drawing the ball of wool rests on two rollers, thereby making the unwinding process very easy and smooth. It is not necessary to stick to the design as shown: a square case would be equally serviceable and somewhat easier to make, but really nothing like so attractive as the eight-sided one as shown.

If a little trouble is taken to mitre the edges of the eight sides nicely there is no reason why any difficulty should be experienced in making a good fitting case. Almost any kind of hardwood can be used but the writer has a preference for either walnut or mahogany. Both these are splendid woods to work with and will take a good polish.

The Sides

Start by cutting the eight sides for the case 6ins. long, 2ins. wide and ⅜in. thick. The best way to get the correct angles for the mitres is to draw out the plan to full size, as shown in Fig. 2. Then you can proceed to mitre the edges. Go slowly, planing off a little at a time until a perfect fit is obtained, laying the work on the plan from time to time to get the mitre lined up correctly.

Before any gluing is done the head and tail should be made and fitted in position. The head is made from a piece of 2ins. diameter wood about 2½ins. long. With a knife and chisel carve it to the shape shown, leaving a flat piece for fastening to the side of the case.

Do not make the beak too pointed as a medium size hole must be drilled through for the wool to slide in easily. About ⅛in. should be ample for the hole, which is drilled right through the head and near the top of one of the sides of the case.

Shaped Head

The head is nicely glasspapered and also the hole through it must be made very smooth, as the wool is liable to catch on the slightest roughness. The eyes are made by fixing a glass bead on either side with a large headed pin. Now fix the head in position with a little glue and two small wood screws on the inside.

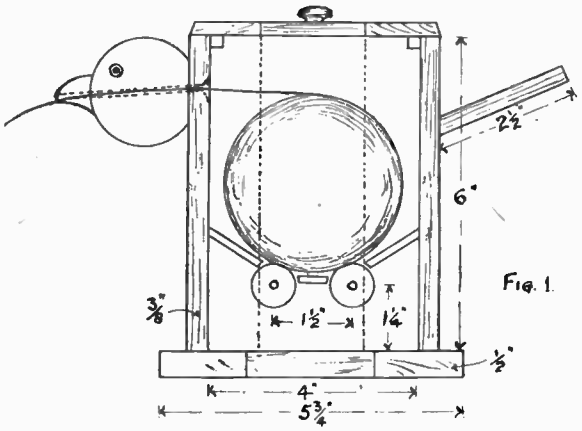


Fig. 1

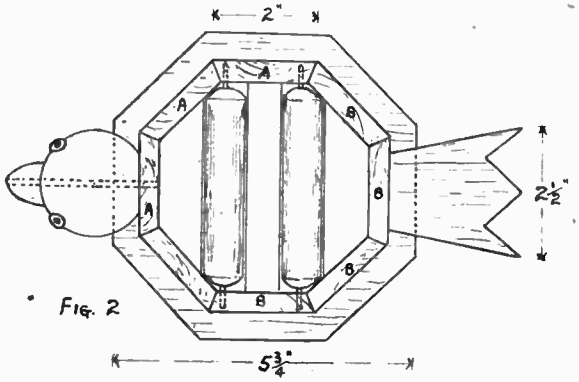


Fig. 2

The Tail

In order to give a balanced appearance to the article a tail is fixed on the side opposite to the head. It can, of course, be used to carry the case. A piece of ⅜in. wood 2½ins. long and 2½ins. wide is cut similar to the pattern and glued and secured with panel pins, as shown in Fig. 1.

The case can now be glued together in two pieces—all the sides marked (A) in Fig. 2 making one half, and all the pieces marked (B) for the other half. These two halves are fastened together after the rollers have been fitted, which is the next job.

Two pieces of ⅜in. dowel rod slightly less than 4ins. long are pivoted 1½ins. up from the bottom of the case. The pivots may be ⅛in. dowel rod or thin nails with the heads cut off and filed up smooth. For a neat job the pivot holes should not be drilled right through the sides. The two rollers are placed 1½ins. apart.

False Bottom

Reference to Fig. 1 will show a kind of false bottom which is fixed on either side of the rollers and also between them. This is to prevent the ball of wool from falling through when it is nearly used up and is very small. Quite thin plywood can be used and the two side pieces are best cut and glued in position before the two halves of the case are glued together. Leave a gap of about ⅛in. between the rollers and the false bottom.

Now glue the two halves together, making sure that the rollers run easily and do not bind anywhere, nor should there be too much play here. When nicely dry and set hard, the false bottom between the rollers is cut and fixed.

Heavy Base

A good solid base is now needed to help keep the case steady, but if the hole in the head is nicely smooth and the rollers turn easily, the wool should glide out of the beak without any effort, and not need to be pulled.

The base projects ½in. beyond the case and is, therefore, cut from a piece of wood 5¾ins. square and ½in. thick. It can be fastened to the sides either by gluing or with countersunk screws from the underside.

Lid Part

A neat fitting lid will complete the woodwork and a thickness of ¼in. is ample for the job. Cut it to exactly fit the top of the case and bevel the edges slightly. In order to keep the lid in position a few strips of ¼in. square wood are glued inside the lid—four would be sufficient but a neater job will be made if they are put all round. Complete the lid by fitting a small knob in the centre.

Glasspaper the whole case and either french polish, or a better finish is obtained with a good wax polish. There are many other ideas that could be adopted instead of the bird's head—for instance, quite a number of animals are suitable for the job, provided they have a nice mouth to open and that they do not tax the carver's skill too much. (350)

The photographer can make this fixed focus

DAYLIGHT ENLARGER

EVERY amateur photographer knows the advantages of owning an enlarger, but it is not every photographer who can afford this rather expensive piece of apparatus.

If you do not own an enlarger and would be satisfied with postcard size prints from V.P.K. or similar negatives, try making the daylight enlarger described below. It is quite an inexpensive item to make, the constructional work is easy and needs only the simplest of tools, and, once made, enlargements can be produced as easily as ordinary contact prints.

The Lens

An enlarger is actually a form of camera and (as in the camera) the lens is the most important part of the equipment. An ordinary magnifying glass will serve quite well as an enlarger lens, but for really high-class results a proper camera lens should be used. It is always possible to buy a cheap second-hand box camera, and the lens of this would be ideal for the job.

The length of the enlarger box will depend on the 'focal length' of the lens to be used, and if there is any choice in the matter this focal length should be about 3ins.

Focal Length

Measuring the focal length of a lens is simple enough. In a darkened room stand a candle at one end of a table and a sheet of white paper at the other end. Hold the lens near the paper and adjust its position so a sharp image of the lighted candle is thrown on the paper. Measure the distance between the lens and the paper, and this will give the focal length of the lens. Fig. 4 is a diagrammatic view showing how the light rays pass from an object to the paper via the lens, the focal length of the latter being marked F.L.

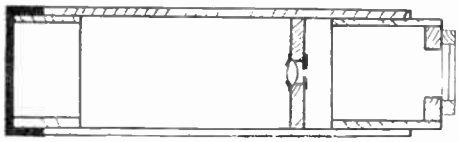


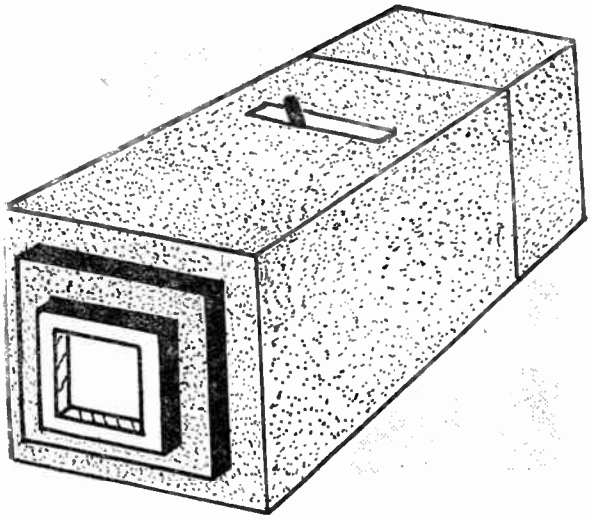
Fig. 1—Sectional view of article

Most lenses of the box camera type have a focal length of about 3ins., and the enlarger described below is for a lens of that particular measurement. For other focal lengths it will be necessary to work out the distance between the lens and the negative and lens and paper in the manner described at the end of the article.

Fig. 2—Section of lens holder

Wood $\frac{3}{16}$in. thick is used for the enlarger box, the top and bottom being 1ft. 2ins. long by $5\frac{7}{8}$ins. wide, and the sides $3\frac{1}{2}$ins. wide. The sides are glued and pinned on to the bottom, but the top is not put on at this stage.

Two wooden 'collars' are made to form a tight fit at each end of the box. At the back of the enlarger the collar is $1\frac{1}{2}$ins. long and is open at back and front (projecting $\frac{1}{2}$in. beyond the back of the sides) while at the front of the enlarger the collar is 3ins. long. This latter collar is closed in at the front with a wooden panel from which a rectangle of the negative size has been cut, but at this stage the collar is not fixed firmly into place.



Box Framework

These two collars are clearly shown on the sectional side view of the enlarger at Fig. 1, though the drawing (more especially in length) is not true to scale. At the back of the enlarger it will be seen that a lid (shown in solid black) fits over the collar, and this should be the next part to be made. It is of simple box-like construction of $\frac{3}{16}$in. wood, with a bottom of similar thickness.

The lens must then be mounted in the centre of a piece of $\frac{1}{2}$in. thick wood measuring $5\frac{1}{2}$ins. long by $3\frac{1}{2}$ins. high. A hole of slightly less than the lens diameter is drilled in the centre of this, and the lens fastened over the hole by four small clips of thin metal. At the other side of this panel a 'diaphragm' is fixed, this being a square of thin metal with a $\frac{3}{16}$in. hole in its centre that comes in line with the centre of the lens (see Fig. 2 for a sectional view of this fitting).

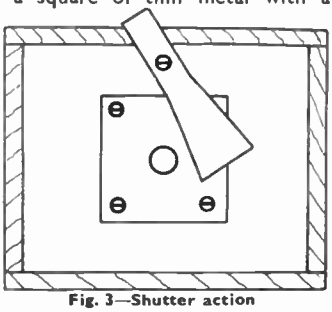


Fig. 3—Shutter action

A shutter must be fixed over the diaphragm. This is a piece of shaped brass, 3ins. long, held by a screw just sufficiently tight to hold the shutter either open or closed. A sectional view of the diaphragm and shutter (in the open position) is at Fig. 3.

The lens panel is then fixed into the enlarger box so the lens is at $4\frac{3}{8}$ins. from the main front of the enlarger (see Fig. 1), being held into place by screws through the sides.

Adjustment

It is now necessary to adjust the front collar. A negative should be put between two pieces of glass and held over the front of the enlarger by a couple of elastic bands. The back of the box is removed and a piece of ground glass is laid in its place.

The apparatus is held towards the light (the top being covered with a piece of dark material to exclude light) and the front collar is adjusted until it gives a perfectly sharp image on the ground glass screen. The collar is then permanently fixed in that position, and the long top of the enlarger can also be glued and pinned into place.

All joints must then be made light-tight with plastic wood, and after a thorough glasspapering the enlarger can be painted inside and out with matt black.

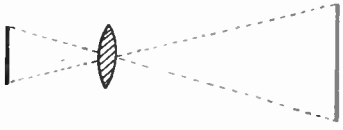


Fig. 4—How the light passes the lens

To use the apparatus, a negative is put between two pieces of glass at the front and a bromide postcard at the other end of the enlarger. The postcard must be inserted in the dark-room. Both back and front are held in place by elastic bands. The enlarger is then taken into the open (negative pointing to the sky), the shutter is opened, the necessary exposure given, the shutter closed, and

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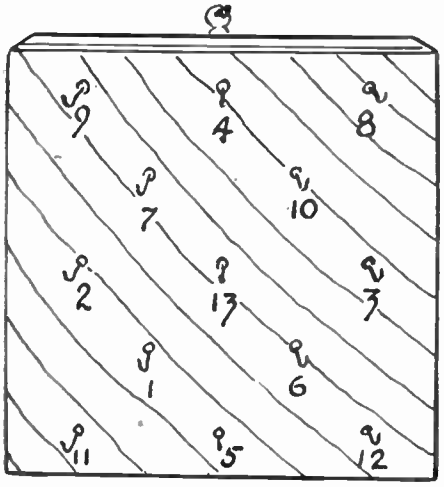
A number of interesting ways of making
A RING BOARD



THOUGH this game has been rather ousted from public favour by the growing popularity of darts, it can still provide amusement and skill, and is certainly worth including in indoor sport. It is cheap to make, as beyond a few pieces of wood for the board, there is only the cup hooks and, perhaps, the rings, to purchase, a matter of pence. Another point in its favour is its freedom from risk, children can be left to play it in complete safety.

The board is shown in Fig. 1. It can be made from any wood available, battened on the rear to prevent warping. Three-ply can also be used or hardboard, but the battens must be so arranged as to come behind the spots where the hooks will be to provide sufficient thickness of material to receive them.

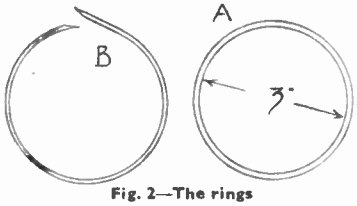


Fig. 2—The rings

This is shown by the side view of the board. Glue the battens and add a few small screws, or if the plywood is thin, substitute small nails, driven into the wood behind and afterwards punched down level.

The spots for the hooks can be set out as shown in the drawing, by marking the rectangle, dividing it into four equal parts and then centring each part. At these points make holes for the hooks. Now glasspaper the board, stain it any colour desired, and paint on the numbers as neatly as possible, black or white. When dry, finish the work with a coat of clear varnish.

Hooks and Rings

The hooks are of the cup variety, to be bought at most hardware or oil shops. Drive these in their respective holes securely. At the top screw a metal glass plate for hanging the board on the wall, or a screw eye can be employed here, as long as the board hangs flat and not tilted.

The rings may be bought at a toy or sport shop. They are of rubber, about the best material for such a purpose, being silent in action. If any difficulty is experienced in getting these rings, then it is not a great matter to make a set for oneself. They can be cut from plywood, with an internal diameter as at (A) in Fig. 2, and external one of 3¾ins., not more. These are, however, rather noisy when striking the board, and a good plan to silence them is to wind a thin cord or twine round them.

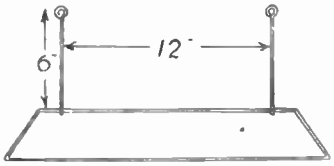


Fig. 3—Netting frame

If you can get a piece of thick rubber, say, about ¼in., then good rings can be made by cutting a strip 1½ins. wide and long enough to make the rings, plus ½in. for the joint. Scarfe the joint as at (B) in Fig. 2, and cement together with rubber solution, binding it until the solution is safely set. This can be cut into six slices to make the set of rings.

Doubtless, ingenious readers may have good ideas of their own to utilise other materials they may have already in their possession. With the rings the game is ready to play.

A Net Accessory

A useful accessory is a net, hung just below the board, into which these rings not lucky enough to find a hook, can drop with safety. It obviates a lot of tiresome back bending, picking up such rings when they drop to the floor, and sometimes roll away. The net is attached to a simple wire frame, something after the shape shown in Fig. 3.

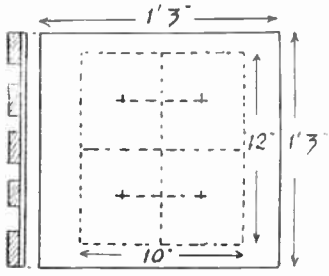


Fig. 1—Side and front view

The frame can be a few inches longer than the board, and about 8ins. wide. The vertical wires shown are soldered to this, and hung from screw hooks, driven in the bottom batten of the board. The net can be stitched up from almost any spare bit of material handy, it does not matter what and is sewn to the frame, hanging downwards to catch the rings.

For Children

If the game is intended for the amusement of children only, quite a good board, and an attractive one, too, can be made from stout cardboard, with battens of wood glued to the back to cover the screw holes. This should be covered with white or coloured paper and the numbers neatly printed on in Indian ink. It can be coloured prettily to please the kiddies, and if clear varnished afterwards, will wear well.

The game is usually played 100 up, and is quite as skilful as darts, and most interesting.

Enlarger—(*Continued from page* 314)

the enlarger taken back into the darkroom for developing the print.

For a fixed enlarger with a lens of focal length other than 3ins., the distance between negative and lens can be found by the formula $F \times \frac{L+l}{L}$ and between lens and bromide paper by the formula $F \times \frac{L+l}{l}$. In both cases F=the focal length of the lens, L=the length of the bromide paper, and l=the length of the negative.

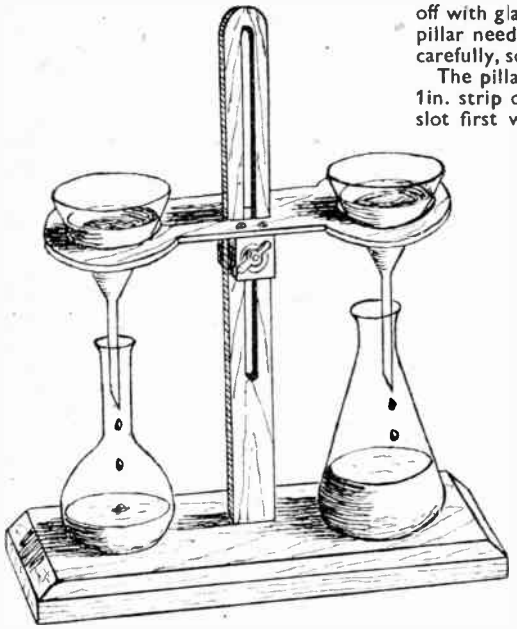
Thus, for focal length 4½ins., negative length 1in. and length of bromide paper 4ins., the distances would be 5⅝ins. and 22½ins. respectively.

Pay careful attention to all constructional details and you will be able to make an enlarger worth several times the cost of materials (236)

Designs are given free with every other issue but not with back numbers of Hobbies

Filter stand, etc. are included in this home-made

CHEMISTRY APPARATUS



THE home chemist very naturally wishes to spend his pocket money on increasing his chemical stock so as to widen the range of his experiments. As, however, the adjuncts to his experiments, the porcelain and glassware and the devices to hold them in position, are expensive, it behoves him to make as much apparatus as possible.

The double filter stand illustrated represents a saving of eight to ten shillings, and as there is nothing difficult in its construction is well worth making. You will probably find the few necessary bits of wood around the house. If these are not quite thick, broad or long enough, it will not matter, as the measurements given can be varied a little.

The base should not, however, be too thin. Thickness is needed to give weight and, therefore, stability. Cut the base 12ins. by 4ins., and chamfer the edges, as in Fig. 1. The chamfer is not necessary, of course, but it gives an authentic air. Alternatively, you can round it roughly with a small fretwork plane and smooth off with glasspaper. The slot to hold the pillar needs marking and fretsawing out carefully, so as to fit the pillar tightly.

The pillar (Fig. 2) consists of a ½in. by 1in. strip of wood 14ins. long. Cut the slot first with a fretsaw, using a metal straight edge if you have one. The width of this slot must be a shade wider than the thickness of the bolt used to move the funnel holder up and down. Now saw out the round top end and glasspaper, taking care that you do not thin down the bottom end so that it fits too slackly in the base slot.

Should the latter misfortune happen, you may with care rectify it by gluing a slip of paper on the slack side of the pillar base. Now to fix the pillar in the base. Waterproof cement is, obviously, preferable to glue, for even the most careful experimenter spills aqueous solutions at times. Apply cement to both slot and pillar base and press in the pillar, making sure the two are flush beneath. Even a slight protrusion of the pillar will produce an unsteady stand.

For the funnel holder (Fig. 3) you need a 10½ins. by 4ins. piece of $\frac{1}{16}$in. thick plywood (or a piece of thin hardwood) and two 1in. squares of ½in. thick stripwood. First mark off on the plywood a 10ins. by 3½ins. rectangle, and with compass and pencil, draw a 3½ins. circle at each end.

Now draw a centre line lengthwise along the wood, and, using this as a guide line, draw parallel lines ¾in. on either side of it, long enough to just intersect the 3½ins. circles. Having thus marked out the outline, it only remains to indicate the inner portions which will have to be cut out.

Draw 2½ins. circles concentric with the 3½ins. circles, then mark off the 1in. by ½in. pillar slot in the centre. Use a fine fretsaw to cut out this part of the stand and glasspaper well at the edges.

Drill the 1in. squares with holes wide enough to take the bolt, and screw them on to the plywood as indicated.

Slip the funnel holder on to the pillar and see if it moves up and down easily. If it is tight, carefully file or glasspaper the tight part of the slot until all is well. If the funnel holder is now replaced on the pillar, and the bolt threaded through, the holder may be secured firmly at any height along the slotted pillar by tightening the wing nut. Steel washers should, of course, be inserted behind bolt head and wing nut to protect the wood squares.

The best finish to use is aluminium paint, as this allows a freer movement than ordinary paint, enamel or varnish, being free of their slight stickiness. The silver colour looks very clean and scientific, too.

With the growing substitution of electricity for gas in our homes, more and more home chemists are being forced back to the spirit lamp. It is useful to have several of these handy and, as small ones cost about half-a-crown, expense can be avoided by making them oneself. They are easily constructed from suitable sized ink or other bottles, as shown in Fig. 4.

The wick tube can be of metal or glass, ¼in. to ⅜in. wide. Cut a 1½ins. length and pass it through a bored cork.

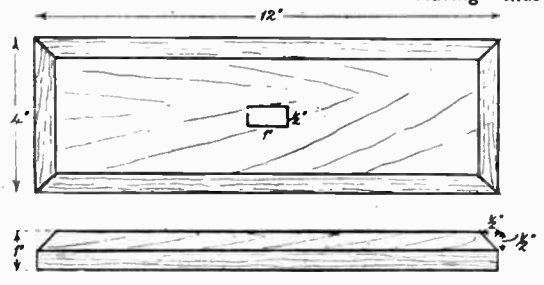


Fig. 1—The base

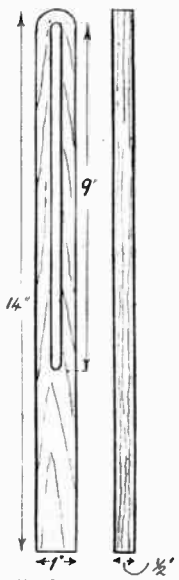


Fig. 2—The pillar

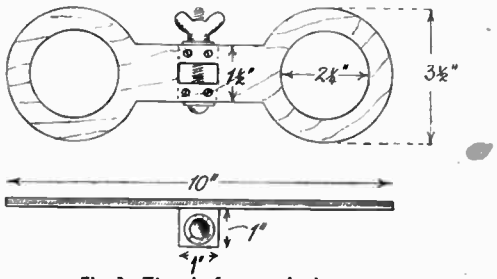


Fig. 3—The platform and wing nut

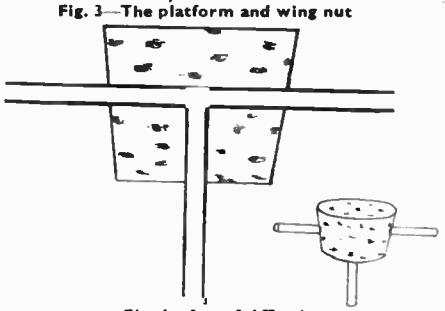


Fig. 6—A useful T tube

Cut a small nick in the cork from top to bottom; this is essential, for it admits air to replace the burned spirit. Without it the spirit will not rise readily.

For the wick either unrove strands from a clean oil lamp wick or strands from a piece of old cotton blanket. Use enough strands to make a not too tight fit. Leave about half the cork protruding from the bottle neck. Over this for a cover press a glass specimen tube of suitable bore.

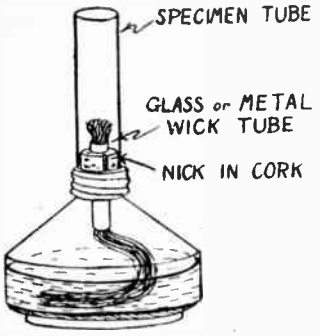


Fig. 4—Ink bottle spirit lamp

For a wash bottle choose a wide mouthed pickle or salad cream bottle, and a soft cork to fit it (you can soften it further by squeezing or rolling it underfoot).

For the exit tube take a length of glass tubing 2½ins. longer than the height of the corked bottle. Make a 45 degrees bend 1½ins. from one end by softening the tube at this point, by revolving it in a spirit or a gas flame. *Let the tube bend by its own weight.* Forcing results in unsightly kinks. Bends should always be made in this manner.

The length of the mouth tube is 3½ins. plus the length of the cork. Bend this 2½ins. from one end to an obtuse angle of 135 degrees. The other end is pushed into the cork until it is level with the bottom. In Fig. 5 the mouth tube is shown deliberately long to indicate its function.

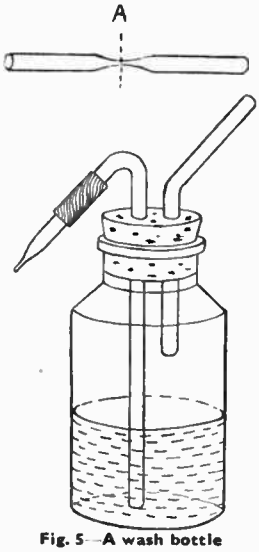


Fig. 5—A wash bottle

For the jet, heat a 5ins. length of tube in the centre, draw it out as shown, and cut at (A) with a file. Join this to the exit tube with a piece of rubber tubing. This flexible jet is an improvement on the fixed type, for you can direct the stream of water to any point with the forefinger and so avoid twisting your neck about. All the open ends of the tubes should, of course, have their sharp edges removed by heating them until the glass just begins to soften.

A Woulff's or gas washing bottle can also be made from a wide mouthed bottle in a similar way, bending the glass tubes at right angles and dispensing, of course, with the jet. Such a bottle will also serve as a gas generating bottle, if you remove one tube and put in a thistle funnel instead.

For a blowpipe take a length of glass tubing and draw out a fine jet at one end. Sever it carefully in the centre of the drawn out part, then make a right angle bend 1½ins. from the jet. A convenient length for the shaft is 8ins. Round off the sharp edges at the mouthpiece by heating.

Dropping pipettes can be made in a similar manner, but dispensing with the bend. These are more efficient if a bulb is blown in the middle. To blow a bulb heat the centre of the tube until it softens, close one end with your finger and blow gently down the other until the diameter of the bulb is about four times that of the tube.

For a sandbath any large tin lid or dish may be used, and a substitute for wire gauze is a sheet of tin. A test tube holder is quickly made from a strip of stout paper folded several times lengthwise. Double it round the test tube and slide thumb and forefinger along the ends towards the tube until the paper is tight. Alternatively, a retort stand clamp may be used.

For a T-tube, a sound cork and three lengths of glass tubing are needed, as shown in Fig. 6. Bore one hole right through and a second at right angles to meet the first. Such a tube is useful for fixing up two bunsens when you have only one gas point, screw clips being used on the rubber tubing between each bunsen and the T-tube, so as to control or stop the supply to each burner.

Prepare for the summer camping with a SIMPLE HAY BOX

A HAY box is easily and cheaply constructed, and is an excellent fuel saver during the winter months, whilst during the summer, when the absence of a fire may be welcome, it can prove a great help in cooking meals. For campers, too, it is a boon.

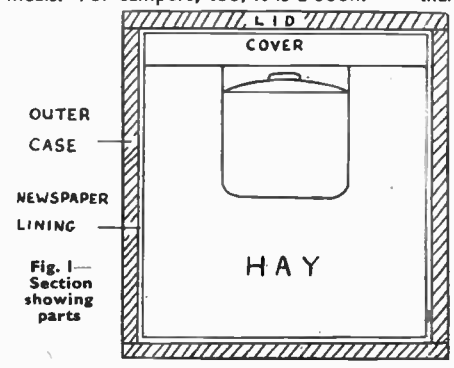


Fig. 1—Section showing parts

The principle of the hay box is simple: the hay inside the box has great heat-retaining powers, so that a saucepan of hot food placed inside will retain practically the same temperature for many hours.

Thus, porridge brought to the boil and placed in the hay box at night will continue to cook, and be hot and ready to eat next morning. The heat insulation is provided by the air spaces between the many thousands of pieces of hay in the box.

Fig. 1 shows a section through the hay box. To construct, you will need a fairly large wooden box with a lid. A packing case or an old trunk will suffice, provided that it is big enough to take the cooking utensils you intend to place inside, with plenty of room to spare. The lid should be hinged, and have a catch to secure it when closed.

Heat Proof

The next step is to make the wood more heat-proof, so get as many newspapers as you can, and tack them along the bottom, sides and lid, so as to form a thick layer, the thicker the better. Newspaper is an excellent insulator, and this layer serves both to keep draughts from entering the cracks in the wood, and to keep the heat inside the box.

Next get some clean dry hay and pack it tightly inside the box, leaving an opening in the centre where the saucepans, etc., will be placed. As a cover for the top of the box just underneath the lid, fill an old pillow case with hay, or make a bag from an old garment.

This can be tacked to the lid of the box, or left loose, as desired. If you have any difficulty in getting hay, you can make some by collecting grass and drying it in the oven or in a shed.

When using the box, place the hot container inside, press the hay close round it, fix the cover over the top, and secure the lid. Do not open the box again until the food is required for use.

Used by campers the hay box overcomes the difficulty of cooking several courses on one stove or fire. Part of the meal may be cooked, and stored in the box while the rest of the cooking is being done. Meals for late comers can be kept warm for hours without difficulty. This is useful in the home, too, where members of the family come home at different times. (357)

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(*Continued foot of page 319*)

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Hobbies WEEKLY

CONTENTS

February 21st, 1951 Price Fourpence Vol. III No. 2886

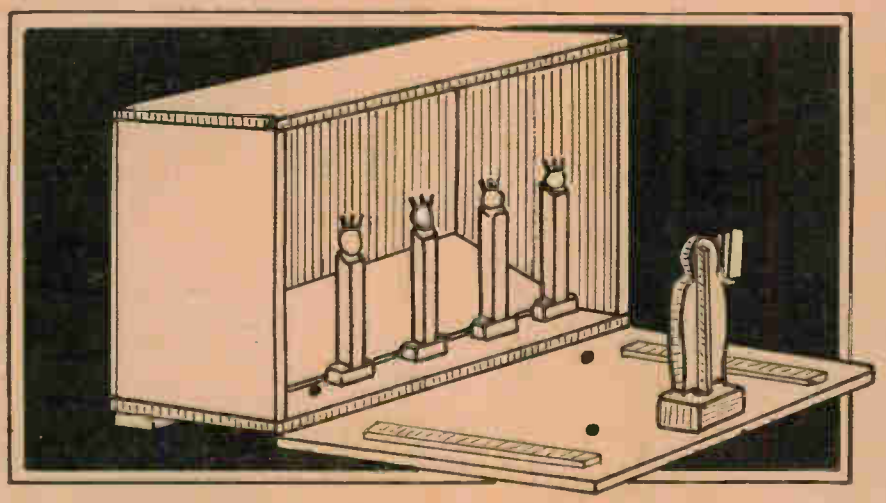
A TABLE TOP COCONUT SHY

IN spite of the many amusements to be seen now at our fun fairs, the coconut shy seems to lose nothing of its old attraction, and is as popular as ever. The little table-top model shown here, therefore, is likely to provide a good deal of amusement for young and old, and is not difficult to make up.

Small ball-bearings about ½in. in diameter (obtainable from most cycle shops) provide the missiles, and they are aimed at the model coconuts from a movable cut-out figure, the arm of which is operated by elastic. The miniature coconuts are cut from wood and are mounted on sturdily-made supports to withstand a heavy barrage. When not in use the whole game folds up into a neat box, which prevents any of the pieces from getting mislaid.

Materials Required

The measurements given make up a shy that is 8½ins. high and 12ins. wide, and accommodates four coconuts; but the exact size is immaterial, and can, of course, be varied to suit whatever wood the handyman may have by him. Wood of ¼in. thickness is allowed for throughout, except for the stands, which are cut from a piece of 1½ins. by ¾in. An oddment of ½in. dowel is needed to make the coconuts, and for the base of the cut-out figure a short piece of ½in. dowel and a block of wood about 1½ins. square and ½in. thick. If preferred, stout cardboard reinforced at the corners may be used for the case, but stout plywood is necessary for the cut-out figure, since this must be as strong as possible.



The Case

Make a start with the case. Fig. 1 shows how this is assembled. Two pieces each 12ins. by 6ins. are required for the top and bottom; two pieces each 7½ins. by 6ins. for the ends; and two pieces 12ins. by 8ins. for front and back. It will be seen from Fig. 1 that the front is hinged on; and to keep the box level when the box is open and the game in progress a strip of the same material is glued along the back bottom edge, as shown. Before assembling the bottom, however, mark and cut out four slits for the stands, each ¾in. square, at equal distances along the front and 1½ins. from the front edge. These will be seen at Fig. 1.

To facilitate the return of the balls, a piece of wood 11½ins. by 3½ins. is fixed at a slight angle on to the inside bottom of the case, behind the stands, as shown, and if thin strips are glued along the outside edges of the lid, just far enough in to allow the lid to be closed, this also helps to prevent the balls from rolling off the table.

The Coconuts and Stands

Four miniature coconuts can be easily made from pieces of ½in. dowel. First cut off four pieces each 1in. long and round one end smoothly. Make three or four

sawcuts downwards from the other end, for $\frac{3}{8}$ths of an inch, then with a sharp knife (and a little patience) whittle each of the pieces into the shape of the hairy coconuts as exhibited for our amusement at the fairground.

To make a strong job of the stands they are best cut out of the solid, as shown at Fig. 3. First cut four pieces of $1\frac{1}{2}$ins. by $\frac{3}{4}$in. to a length of $4\frac{1}{2}$ins. Mark

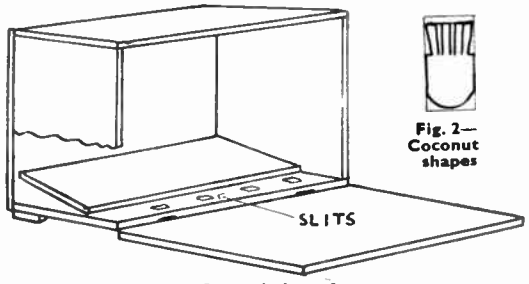


Fig. 1—General view of carcase

Fig. 2—Coconut shapes

Fig. 3—The stand

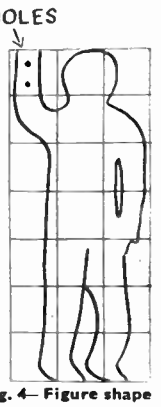


Fig. 4—Figure shape

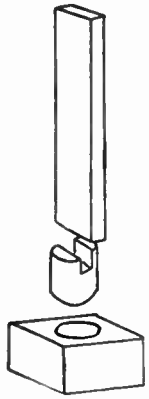


Fig. 6—Base and strut

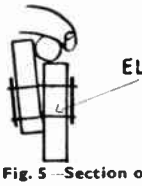


Fig. 5—Section of working

CUTTING LIST

No. of Pieces	Description	Size
2	Cases, top and bottom	12" × 6" × $\frac{1}{4}$"
2	Cases, ends	$7\frac{1}{2}$" × 6" × $\frac{1}{4}$"
2	Cases, front and back	12" × 8" × $\frac{1}{4}$"
1	Case, slanting base	$11\frac{1}{2}$" × $3\frac{1}{2}$" × $\frac{1}{4}$"
4	Coconuts	1" × $\frac{1}{2}$" dowel
4	Coconut stands	$4\frac{1}{2}$" × $1\frac{1}{2}$" × $\frac{3}{4}$"
1	Cut-out figure	$3\frac{1}{2}$" × $1\frac{1}{2}$" × $\frac{1}{4}$"
1	Cut-out arm piece	1" × $\frac{3}{8}$" × $\frac{1}{4}$"
1	Cut-out strut	3" × $\frac{1}{2}$" × $\frac{1}{4}$"
1	Cut-out dowel	$\frac{3}{4}$" × $\frac{1}{2}$" dowel
1	Cut-out block	$1\frac{1}{2}$" × $1\frac{1}{2}$" × $\frac{3}{4}$"

them out $\frac{3}{8}$ths from each edge, then saw down as shown, to make pillars $\frac{3}{4}$in. square but leaving a shoulder the full $1\frac{1}{2}$ins. wide $\frac{1}{4}$in. from the bottom end.

Fit these into the four holes cut for them in the bottom of the case, but do not glue them in until the cups have been done. To make these cups, first bore with $\frac{1}{2}$in. bit a hole about $\frac{1}{2}$in. deep, from the top end. Cut off the top at a slight angle, as shown, then with knife and glasspaper finish off the tops into bowls in which the coconuts will rest (but not too firmly—or the competitors may come to have the same suspicions that we ourselves get when the nuts at the fair seem to be glued in!).

The Cut-out Figure

One suggestion for the little cut-out figure is given at Fig. 4, ruled in $\frac{1}{2}$in. squares for copying. Cut this out in plywood, the thicker the better. Drill two holes in the top of the upraised arm, as shown, and cut a small piece to fit behind and slightly higher than this arm, as shown at Fig. 5.

This piece is also drilled with two holes corresponding to those in the arm. Now with a strong elastic band fix the two together, holding the elastic in place with matchsticks on either side, as shown. A little experimenting here is well worth the time taken, to ensure a good throw for the balls. The elastic should be as strong as possible, and fixed short enough to allow of only a little play between the two pieces of wood.

On the other hand it must not be too tight, or the strain of flinging the balls will break it after a time or two. With a little practise it will soon be found just how the elastic needs to be to throw the balls at the correct range and with the right degree of force to dislodge the coconuts when they are hit.

A narrow strut $\frac{1}{2}$in. wide and 3ins. long is glued to the back of the figure, projecting at the bottom for a $\frac{1}{4}$in. Now cut a piece of $\frac{1}{2}$in. dowel to a length of about $\frac{3}{4}$in., and in it make a slit $\frac{1}{4}$in. deep. The projecting end of the figure-strut is glued into this, as seen at Fig. 6.

Cut a block of wood $1\frac{1}{2}$ins. square and about $\frac{3}{4}$in. thick and bore it at the centre to a depth of $\frac{1}{2}$in. with a $\frac{1}{2}$in. bit. Glue this block on to the lid of the case, in the position where the figure will stand when in use. This then acts as a stand for the figure, the projecting end of the dowel fitting into the $\frac{1}{2}$in. hole; and in this way enabling the figure to be turned round as required for aiming the balls at any of the coconuts.

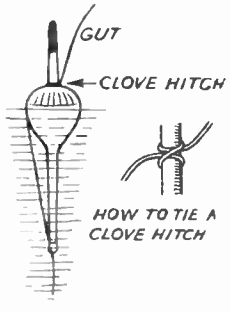
Storage

When not in use the figure will, of course, be lifted out of this block and stored in the case with the coconuts and balls.

Finish off the case and figure with stain or gay-coloured enamels, as preferred, and fix a small fastener on to the lid of the case, to hold it closed when not in use. (353)

Substitute Float Caps

THIS tip will be useful to those who go in for float fishing. If the small cap has been lost off the top of the float, the



best thing to do is to tie a clovehitch in the gut after oiling it, then just slip it over the top of the float and pull tight. This will hold very well and is very neat.

Water Stain

MANY fretworkers use water stains for staining their wood, and find that the stain takes a very long time to dry, and is a totally different colour from what it was when wet.

This can be rectified by putting a few pulverised crystals on a rag which is made into the form of a pad, and applying a small amount of water. Rub in, like polish, and a smooth, even colour will be obtained, on which polish may be applied almost at once.

To Remove Fingermarks

FINGERMARKS can be effectively removed from doors in the following manner. Rub the marks with clean piece of flannel dipped in paraffin oil. Afterwards wipe with clean cloth wrung out in hot water to take away the smell. This is better than using soap and water, as it does not destroy the paint. Paraffin oil is also excellent for cleaning varnished doors outside, which face the dust and rain.

Paperhanging Hints

AMATEURS will find their task a much easier one if they apply their paste to the wall instead of the paper, which is apt to tear and give trouble. When it is necessary to put a patch on Wallpaper, instead of trying to match the pattern, put the new piece on square and neat, tear it roughly and paste securely, and the rough edges escape notice.

A useful addition to any workshop is this fitted

HANGING TOOL CHEST

THERE is not always a spare place for the handyman's chest of tools, and if there is, the chest frequently has a host of odds and ends stood upon it, making for loss of time and temper when a job is required to be done at short notice.

On the other hand, space upon a wall for a hanging cabinet of tools can generally be found, and the inconvenience mentioned thereby obviated. All tools need to be kept in good condition and should, therefore, have their own special places in racks or small drawers purposely arranged for them.

Such tools, however, as hammers, clamps, pincers and a number of others of the heavier type, of course, will stand rough usage and may thus not need quite so careful attention.

The thoughtful workman, for instance, would never allow his chisels to lie about with files and rasps, nor pointed tools such as gimlets, drills and awls to get mixed up with odds and ends in a tool box or drawer.

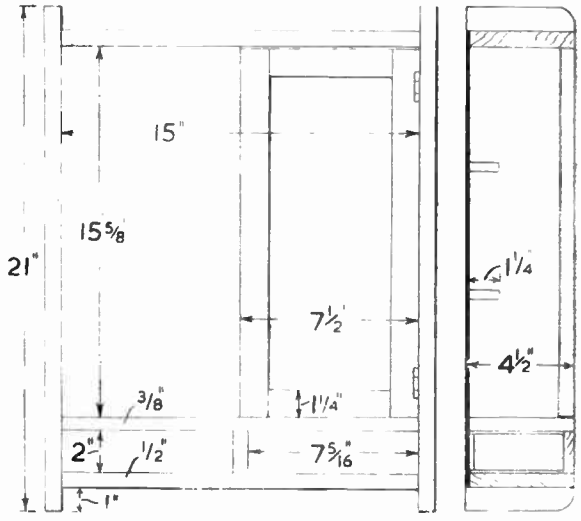
By having proper racks and chosen positions for each tool in the racks, there should never be time lost in searching around, and one can always be sure of the edges and points being well preserved, that is, of course, if due care is taken in the actual handling.

Now, a hanging cabinet for tools will have to be strongly constructed, more so, perhaps, than a chest where the weight is more or less wholly supported by the floor

Care should at the outset be taken to choose only those tools for hanging in the cabinet which are really essential, and which are most generally used for light carpentering jobs in the house as well as, of course, for the favourite hobby of fretwork.

For All Tools

The most useful type of hanging cabinet is that shown in the sketches where ample racks are provided for ten or so edged tools and shelf space for smaller articles. The top portion is enclosed by a pair of doors, while immediately underneath there are two



Figs. 1 and 2 Front and side view showing parts and dimensions

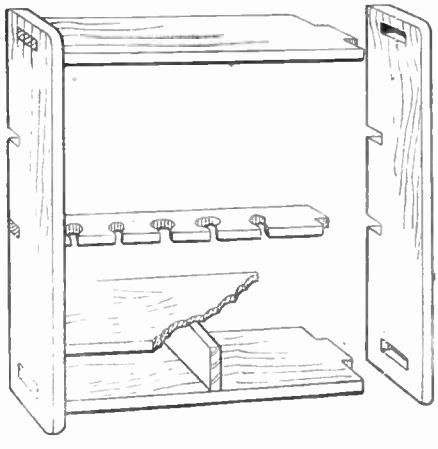


Fig. 3—Construction of carcase

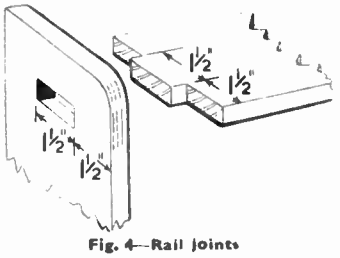


Fig. 4—Rail joints

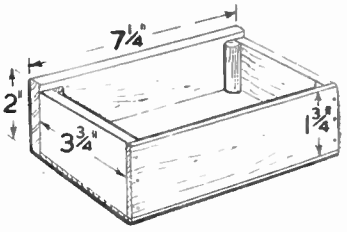


Fig. 8—The drawer

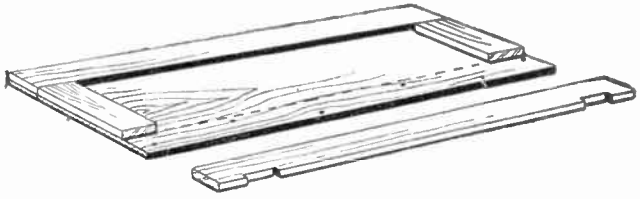


Fig. 7—Door construction

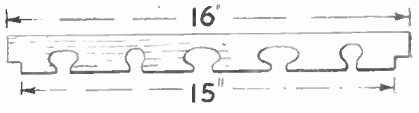


Fig. 5—The tool rack

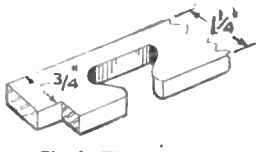


Fig 6—The tool slots

useful drawers or small articles such as fretsaws, drills, saws, and small screws and nails. A very useful position is chosen for a 12in. fretwork handframe.

A good idea of the interior space and the general arrangement of the parts may be got from Fig. 1 which shows only one door and the spaces to be occupied by the two drawers.

Fig. 2 gives a section through the cabinet showing the suggested positions of the racks, etc.

General Construction

Fig. 3 shows the general construction, a portion of the floor of the cabinet being cut away to show the cross partition separating the drawers. Figs. 4, 5 and 6 show details of the joints adapted for the shelves and racks, and also the openings cut in the latter for the tools. Fig. 7 gives the construction of the doors, and Fig. 8 one of the drawers with a view taken from the back of same.

A suitable wood for the cabinet is deal throughout, with plywood for the main back and for the floors and backs of the drawers. The plain screwed or nailed butt joint is hardly strong enough for holding the main sides to the lower floor and top, and the ordinary open tenon joint, shown in Fig. 4 has, therefore, been used. The weight of the tools, too, is taken directly by the sides, the rack ends being slotted, as in the detail Fig. 6.

The Sides

In setting out the sides, therefore, two pieces measuring 21ins. by 4½ins. by ½in. thick must be marked off to the several dimensions given in Fig. 1, notice being taken that the floor of the cabinet which is ⅝in. thick is not tenoned through, but is supported by the mid partition and screws through the sides. Two pieces measuring 16ins. by 4⅜ins. wide by ½in. thick will be wanted for top and lower floor with tenons 1½ins. wide and spaced 1½ins. from front edges, as in Fig. 4.

The front edges of these four sections must be kept flush, the ½in. to spare at the backs of the 'shelves' being occupied later by the ¼in. plywood back. Fig. 2 clearly shows this arrangement. See that all the tenons fit tightly, so when the pieces are knocked together they stand rigidly, while the other pieces are being set out and fitted.

Mark out and cut in the slots in the sides ⅜in. long and ⅜in. wide, and make the two racks to fit these, as Fig. 5, the openings for the tools being, of course, cut to fit each as required.

Assembly

All the parts may now be finally fitted and then glued together and the cross partition, measuring 4⅜ins. long by 2ins. wide by ⅜in. thick, set across centrally with the floor of the cabinet laid across this again and screwed through the sides. The floor is 15ins. by 4⅜ins. by ⅜in. thick. At this stage the corners of the sides should be rounded off and glasspapered smooth with the sharp edges of the shelves and sides taken away.

The doors consist of two pieces of ⅝in. thick wood with upright and cross rails of ⅜in. deal screwed and glued to the face, as Fig. 7. The screws are put through the wood panel and run into the rails, care being taken not to let the points of the screws come through on the face of the doors. Cut shallow recesses 1½ins. long to take the hinges in the two side upright rails, as shown in Figs. 1 and 7.

Door Rails

Use a fine tooth tenon saw when cutting off the short rails of the doors, or better still, use a fretsaw which will give the finest possible joint between the rails when they are laid on the door panels and glued up. Clean off the edges of the doors, and after hinging them, put on ball catches and a suitable knob.

The back of the cabinet consists of a sheet of thin wood 17ins. long by 15ins. wide. This may be made up in two or more narrow widths. Do not cut to these given sizes but take the exact measurements from the job direct. Screw the backing to the back edges of the floors and top and bottom racks.

Drawers

The drawers are of very simple construction, as detail Fig. 8 shows. The measurements for each part is given and the quarter beading to be glued into the corners for strengthening clearly shown. The fronts and sides of the drawers are ⅜in. thick, the back and floor of ¼in. or ⅜in. plywood. Clean up all the woodwork of the drawers and see that they fit closely but not stiffly.

The whole of the cabinet should be cleaned up and glasspapered, and all sharp edges taken off. Give one coat of lead paint priming, and finish with two coats of good oil paint. Put on two stout hanging plates and plug the wall with Rawlplugs to receive the fixing screws.

Answers to reader's problems on Electrical Queries

Changing Current

I HAVE recently moved, and the house is wired D.C. and I have an A.C. radiogram. Is it possible without going to too much expense, to get a rectifier to alter D.C. to A.C., or is there any other way? (T.G.W.—Ilford).

A.C. may readily be changed to D.C., but the reverse cannot be accomplished except by means of a rotary convertor. (A unit containing a motor to operate from the D.C. mains, driving a dynamo producing A.C.). These are rather expensive units, and you could write to Valradio, 57 Fortess Rd., N.W.5, giving full details of your requirements and ask for quotation. Most A.C. receivers can be modified to work from D.C. mains by using series connection for heaters, and omitting the transformer and rectifier circuit, but this modification can only be undertaken by a person with sufficient technical knowledge and the expense would render it undesirable if a radio shop had to be asked to make the necessary, fairly extensive changes. Receivers may be purchased suitable for use on both A.C. and D.C. mains.

Gramophone Drive

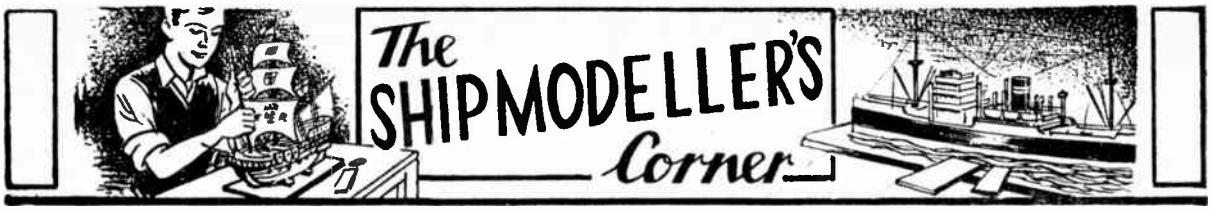
IS it at all possible to gear an electric motor to drive my clockwork gramophone? (F.B.—Bolton).

THERE is no reason why any electric motor should not be used to operate a gramophone turntable, provided it is sufficiently powerful. A high reduction ratio is required, and in ready-made electric gramophone motors this is usually obtained by worm-wheels. A light belt might be used, with gearing for the final reduction, and the turntable should revolve at 78 r.p.m. Most electric motors run at about 2,000 to 4,000 r.p.m. and a few experiments with different gear ratios may be necessary to find that required with your particular motor. A ratio of between 30 and 50 to 1 will normally be required.

Motor Trouble

I OBTAINED two electric motors but could not get these to turn, either with D.C. or A.C. Moreover, they stick when current is applied to them. (P.D.—Malta).

NORMAL repeater motors are not intended to drive any models or similar equipment in the usual way. In aircraft, such motors are used with one armature mechanically coupled to a directive loop aerial, and the other, situated at some distance (e.g., near pilot) fitted with an indicator. When one armature is rotated by external means, this causes fluctuation in the field coils of the second unit of such a kind that the rotation of the second, distant motor, armature follows that of the first. The indicator and loop, therefore, move in unison. It may prove impossible to get the motors to 'run' in the usual way, since they are not designed for this. D.C. is unsuitable. With A.C. some such motors will run provided they are given an initial spin, which must be of such a speed that one armature pole passes each field pole at a frequency which corresponds to the change in frequency of the A.C. supplies. (That is, as a synchronous motor). The revs. per minute necessary for such starting, may be calculated by dividing the number of armature poles into the frequency of the A.C. supply and multiplying by 60.



Standing Rigging for The Royal Sovereign

by 'Whipstaff'

AS our hull is now complete we start, what is to me, always one of the most interesting details of Ship Modelling, namely the rigging.

Assemble the masts as detailed in your kit design, add rings of gummed paper about $\frac{3}{32}$in. wide around the lower masts, space them $\frac{1}{2}$in. apart and paint dull black. These will simulate the mast bands. Glue masts in position and leave to set.

Next make all shrouds as in your instructions and erect them in position on the model.

If you would like to give the added touch of deadeyes on the shrouds and channels use a pair of long-nosed pliers and clip into position angler's small split shot. Paint black and at this small scale they will give the right effect.

Now follow our standing rigging sketch in numerical order. First, No. 1, our bowsprit gammoning, seizing this in the centre with fine thread.

The following rope is the mainstay No. 2. This is double and passes one each side of the foremast, through two holes drilled downwards through the beakhead bulkhead and secured to the heel of the bowsprit.

The next ropes are single. No. 3, the forestay; No. 4, the foretopmast stay and bridle; No. 5, the foretopgallant stay and bridle; No. 6, the fore royal stay; No. 7, the maintopmast stay; No. 8, the maintopgallant-stay; No. 9, the main royal stay; No. 10, the mizzen stay; No. 11, the mizzen topmast stay; No. 12, the mizzen topgallant stay.

The following ropes are repeated on each side of the ship, port and starboard, and are secured to eyelets in the deck, which we also use later for securing our running rigging ropes.

No. 13 and No. 14, the mizzen backstays; No. 15, No. 16, No. 17, No. 18, the main, maintopmast, main topgallant and main royal stays.

No. 19, No. 20, No. 21, the foretopmast, foretopgallant and fore royal stays.

Shrouds have been left off our sketch and backstays on one side only shown in order to make our small sketch easy to follow.

And now to our running rigging.

Before commencing to put in place our running rigging on our little model we must prepare the yards.

Take all square yards, finished to correct section and taper, and, having made some two dozen or so small eyelets from bank pins, we insert them with a touch of glue into the yards in the positions shown in Fig. 1.

Next cut off several bank pins, giving a length of $\frac{1}{8}$in. of the end. Glue these point outwards in tiny holes drilled in the centre of each yard. These are for pinning and gluing the yards to the masts.

Now we drill a small hole in the end of each yard, to run fore and aft when the yards are in position. These, together with the eyelets, are to carry our running rigging in place of blocks, which if made to exact scale, would be too small to be practical.

Stain all eyelets black, either chemically or by painting with 'Hobbies' egg-shell black, and, when dry, glue on sails to respective spars.

We now put a spot of glue around the pin point in each yard and press into position on the mast. They can then be left to allow the glue to harden.

The model will look better if the yards are trimmed and sails braced slightly to show the wind on the quarter. The position the yards will then occupy is shown in Fig. 2. This shows the set of the yards when looked at from above.

Our first rope is the spritsail-topmast yard brace. This we take from the forestay, through the tiny hole at the end of the yard, down through a small eyelet on the bowsprit to the top of the knighthead. As there is no knighthead on the beakhead deck of our small model, we secure this rope to a small eyelet fixed in the beakhead deck at the keel of the bowsprit. There must be one of these braces on each side of the ship, (A) in Fig. 3.

Our second ropes are the spritsail-topmast lifts, (B) in Fig. 3. Secure one end to a small eyelet in the spritmast top (crow's nest) and carry it through a small eyelet on the end of the sprit-topmast yard, down to a small eyelet on the spritsail yard and thence up to the point of the bowsprit, again one on each side of the ship.

Now take the outer brace (C) in Fig. 3 from the forestay, through the small hole at the end of the spritsail yard, up to the forestay and down to fasten to eyelet at the foot of bowsprit. The same eyelet to which we secured our first rope will again serve us here.

To save repetition, all ropes from now on must be duplicated on each side, port and starboard, unless otherwise stated.

The spritsail sheets go from the corner of the sail and are secured to a small eyelet at point (X1) on the hull.

Our next operation is that of rigging the foremast. (If you fix royals to the small yards shown at the top of the masts in Hobbies design, you must rig as for the other square sails, if not, merely show the royal yard lifts).

Your lifts go from the ends of the yard to the top of the mast for the royal yard, and as shown in Fig. 4 for the other yards. In actual practice they lead through various blocks and tackle to the deck, but at our small scale we will omit this, and take them down through a small eyelet in the side of the mast top and down to the screw eyes at the foot of the mast, which in our model take the place of the fife rails. (Do not forget, finer cord for the running rigging).

Fig. 4a shows all deck screw eyes and eyelets in position. At this small scale when the rigging is secured to the screw eyes they will have the appearance of fife rails, especially if painted black to make them less obvious.

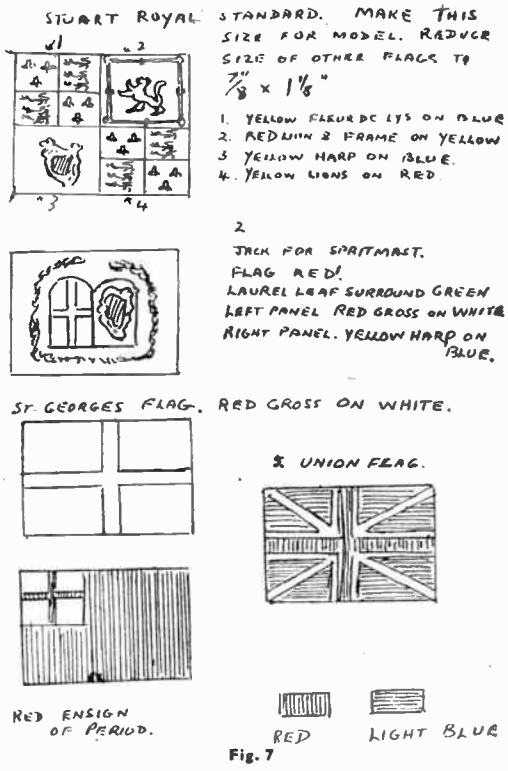


Fig. 7

Now turn to Fig. 4 and fit your clew lines on the sails, as shown, from point of sail, through the hole drilled in the end of the yard, up to the eyelet in the yard and down to the eyelet in the deck, just inside the bulwarks. Points of sail are better re-enforced as in small Fig. 4.

Next take your leech lines from the edge of sail, up through the eyelet in the yard and down to the second eyelet in the deck, next to that of the clew line. There are two leech lines on each side of the sail.

Follow this by taking the sheet of the sail from the corner, through the hole drilled in the end of the yard, along the yard, through the eyelet and down to the third eyelet in the deck, next to that of the leech lines.

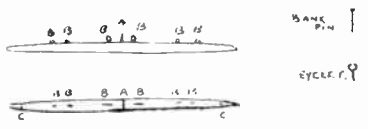


Fig. 1

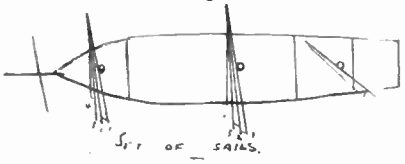


Fig. 2

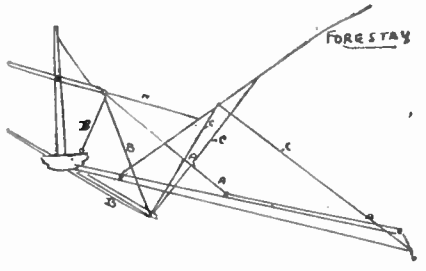
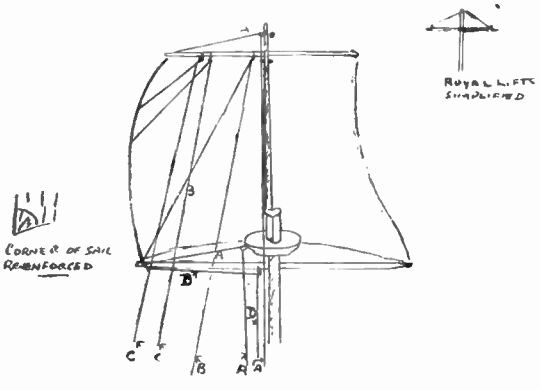


Fig. 3



SKETCH 4A. POSITION OF DECK EYELETS & SCREW EYES

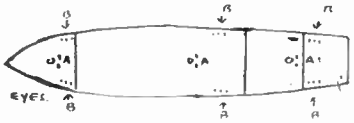
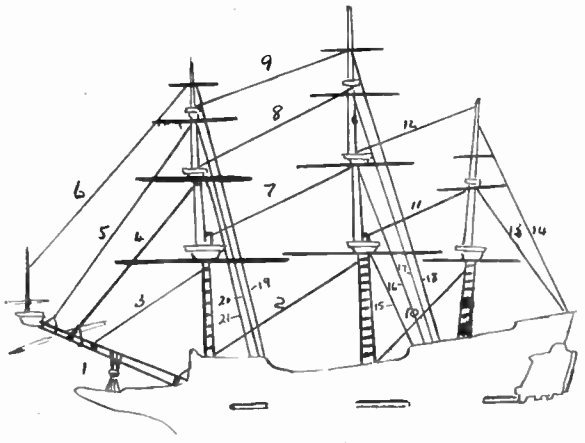


Fig. 4



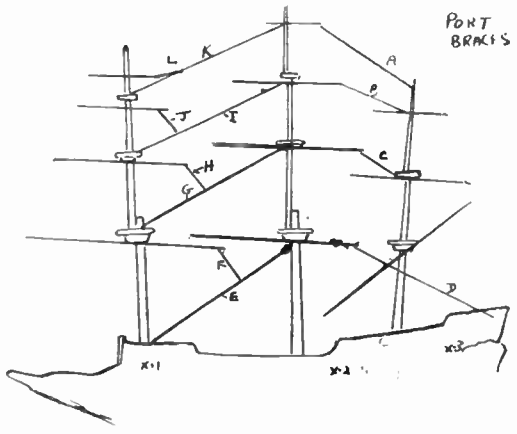


Fig. 5

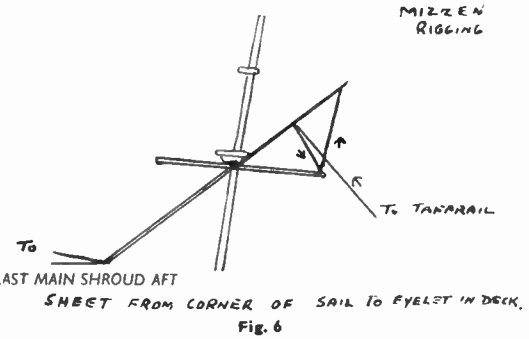


Fig. 6

These rigging lines must be repeated on all the upper square sails, both on foremast, mainmast, and mizzenmast and on foresail and mainsail with the exception of the sheets. These go from the corner of the foresail and mainsail to

(*Continued foot of page* 327)

How the home electrician can undertake
REPAIRING FUSES

IN order to use electrical items such as wireless sets, irons, and reading lamps, off a plug which is used for heaters, it is advisable to make use of what is termed a safety adaptor. This adaptor is fixed into the heating wall plug socket, and allows for the heater to be used in the standard 15 amp. socket while the iron or reading lamp is used in the smaller 5 amp. socket. The safety adaptor is provided with two small cartridge fuses which are for the purpose of protecting small consumption apparatus.

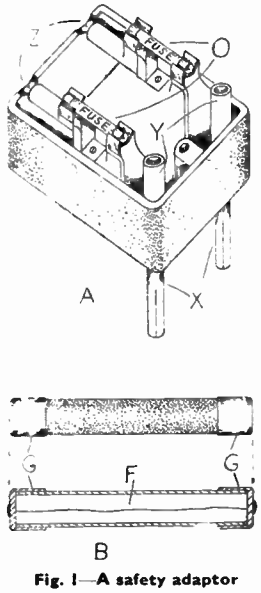


Fig. 1—A safety adaptor

One type of safety adaptor with the cover removed is indicated in view (A) Fig. 1, of the accompanying illustrations. Here we have standard 15 amp. plugs marked (X), which fit into the 15 amp. wall socket, and such apparatus as an electric fire is plugged into the 15 amp. socket (Y).

The 5 amp. outlet sockets into which is plugged an iron, reading lamp or wireless set, is indicated at (Z). The 5 amp. sockets are provided with two small cartridge fuses marked (O), and these fuses will break or blow if any fault occurs on the small apparatus.

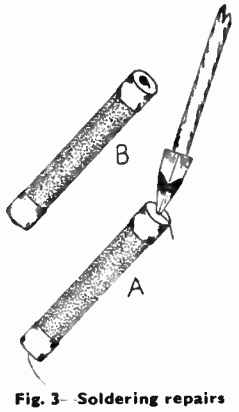


Fig. 3—Soldering repairs

The cartridge fuse is indicated quite clearly in view (B) Fig. 1, and a cross section of the cartridge shows the fuse wire marked (F) in position, connected to the soft metal ends (G). The fuse wire (F) can be renewed if found blown due to trouble on apparatus, and a simple way of doing the job is as follows.

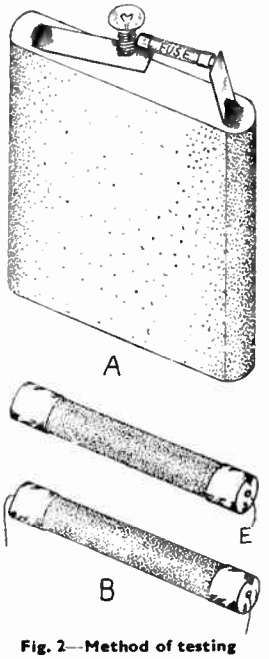


Fig. 2—Method of testing

First of all it is necessary to find out which fuse is blown, or in some cases both will be found blown.

A simple test to employ for finding the faulty fuse is indicated by view (A) Fig. 2. Use an ordinary flat type torch battery as indicated, hold the bulb with its end tip in contact with the long strip connection, and try the fuse with one end in contact with the other battery contact, and the other end touching the threaded side of the bulb, as clearly shown. If the cartridge fuse is in good condition the bulb will light up, provided, of course, the battery and bulb are sound. If, however, the fuse is faulty, the bulb will fail to light up.

Now take the faulty cartridge and make a small hole about $\frac{1}{32}$ in. in each end, as indicated at (E) view (B) Fig. 2. The ends of the cartridge are quite soft, and the holes can easily be made with the point of a small awl or small drill held in a pin vice. Obtain some 5 amp. tinned copper fuse wire and thread a piece through the holes made in the cartridge, as indicated in view (B) Fig. 2.

Usually the ends come off the fibre body fairly easily, and it is a good plan to slip the wire through one end and then take the other end off and pass the wire through, then refix the end on the fibre.

The fuse wire now in position must make a sound contact with the metal ends of the cartridge, and this is done by carefully soldering.

The soldering is best done with the point of a small iron and a piece of resin cored solder. Get the iron of the correct heat and well tinned, then apply a little solder on the end of the cartridge on the wire, as indicated in view (A) Fig. 3. Both ends are, of course, soldered and the finished job is left as indicated in view (B) Fig. 3.

Small cartridge fuses of this type can be repaired many times over if the job is carefully done in the first instance. (347)

Model Ship Building—(*Continued from page 326*)

points (X2) and (X3) on the outside of the hull, fastened to small eyelets.

The braces are our next consideration. and at our small scale we will not follow them right through to the deck, but just show sufficient to give the right effect, so as not to overcrowd our model with rigging.

Attach all braces as in Fig. 5. This shows, of course, only those on one side of the ship for simplicity.

Our final operation is to rig the mizzen lateen sail. All necessary rigging for this sail is given in Fig. 6.

And now to complete our model we need some flags. Owing to the frequent constitutional changes of this period the original vessel would have flown various sets of flags during her lifetime.

The set I have chosen would only be flown for a few months, but this would be about the time of her rebuild, at which period our model represents her.

The first we must paint is the Stuart Royal Standard to be flown at the stern flagstaff.

The second flag that we will show at the spritmast was only for a short time in use, but is very historic in that it saw service in many famous battles and was re-introduced to take the place of Cromwell's union jack on his son's abdication. It is picturesque and was flown by Montagu when he sailed to fetch home the exiled king in May, 1660.

It was superseded again when the actual Restoration caused the Navy to revert to the jacks used prior to 1648.

At the foremast we will fly the St. George's flag, at the main the flag of the union of this period, and at the mizzen the red ensign of this period.

The designs for these flags are shown in Fig. 7. At this scale they cannot be too detailed, but the effect can be achieved.

For those who like detail there were seven sets of gudgeons and pintles on the rudder of the actual ship.

We have now completed our little model and although the small scale made it essential to simplify such details as carving and rigging of this period, we have the effect that gives a real picture of the large warship of the period and an appearance that gives an authentic picture of the vessel and its rig, as our small scale will allow.

I hope you have enjoyed the creation of our model through its various stages and will be pleased to answer any queries sent to me care of our Editor.

If you have found added interest in building this model by the methods outlined, do not miss our future article dealing in the same way with other famous ships in our series of Kits.

The second and final details of scenic effects in

MODEL RAILWAYS

ONE of the most useful materials for making up an artificial ground level is plaster of paris, though, of course, either Keen's cement or builders' plaster are quite satisfactory for 'roughing up' on a sized brown paper substructure. Dental plaster, which is actually an extremely fine grade of plaster of paris, should find a ready use for really fine surface modelling, even very small buildings being produced by cutting it, whilst in a half-set state, with a penknife.

Mixing

There is an art in mixing plasters, and one of the secrets is the use of warm (not hot) water. If it is desired to give more working time between the mixing and the setting, the speed of hardening may be reduced by the addition of ordinary vinegar, the more of which is used in mixing, the slower will be the setting.

Thus, if one part of vinegar is mixed with the moistening water, setting will take place in about half-an-hour; if equal parts of vinegar and water are used, setting will take about two hours; whilst if all vinegar is used for the mix, six hours will be required. By this means, time is given for the manipulation of the plaster. The water and the vinegar should be mixed first, before pouring into the plaster.

Humps and soil heaps are easily represented by merely pouring the liquid plaster over a paper-covered wooden skeleton, the latter being made as described last week. Larger surfaces of rolling countryside are formed by tacking down rough sacking over the wooden skeleton and brushing this over with very liquid plaster. When the latter has set, more plaster can be daubed thereon and worked up into the desired shape.

Key the Plaster

To assist new plaster to adhere to older hard-set plaster, always thoroughly wet the old work with very liquid plaster, applied with a brush, applying the new work before this keying surface becomes dry.

To effect a good key between the railway baseboard and new plasterwork it is a good plan to drive some wire nails into the baseboard, leaving about half their length projecting above the surface. The plaster, when poured over, then will be firmly attached to the base, from which it may be levered as a unit, if desired.

Quick Setting

From the foregoing remarks it will be appreciated that whilst plaster of paris has a great advantage in speed of setting, papier mâché has the greatly desired quality of not splitting when it has to be drilled to receive a signal or lamp post.

To conserve wood, it is quite practicable to use old cardboard boxes, match boxes, screwed-up newspapers or other 'bulking' underneath sacking or hessian, applying either papier mâché or plaster of paris on top of this substructure.

It must be remembered that one single sheet of brown paper is not sufficiently strong to support wet plaster or papier mâché unless it has been first size-coated, dried, and painted, the modelling material being applied after the paint is set hard.

Cover Treatment

All modelled structures, whether of papier mâché or plaster are not waterproof unless they are painted, or at least, shellac varnished after they are hard set, and the unseen bases of such models must always be so treated to prevent moisture creeping up from below.

For outdoor scenic modelling there is nothing to beat cement, which may be either worked into shape or cast in an oiled mould of quite rough make. It may be coloured by the addition of dry paint colours, these being readily obtainable at any ironmonger's store.

The very frailest of substructures may be very thinly covered with 'washy' cement, which, when dry, can be again covered by successive layers, each of which will increase the strength of the model 'hill' until it can be stood upon if desired; such will be the strength of the finished model.

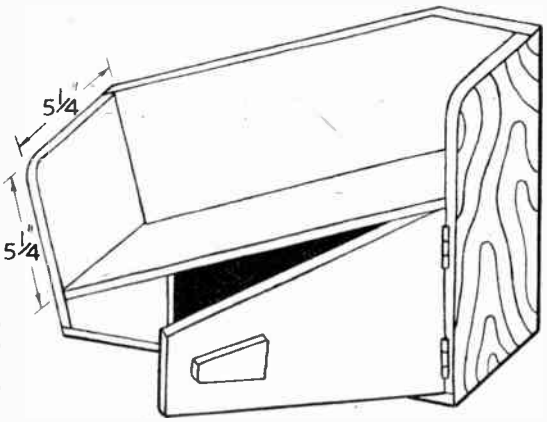
Ponds and Lakes

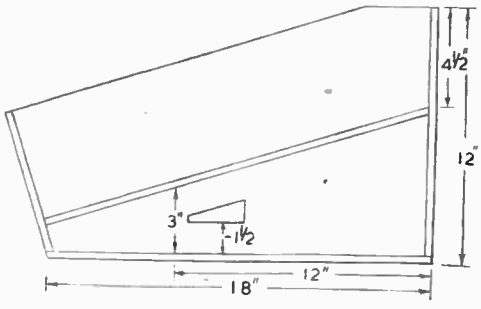
Ponds and lakes may be imitated—on indoor model lines, by sheets of 'hammered' glass (Muranese glass will do, but is not quite so realistic). The back of the sheet should be painted with a 'smudge' paint of greenish-brown tint, and the surface should be streaked and stippled with emerald green paint to give the effect of floating water weeds.

Should your railway layout include a dock-side scene, it must be remembered that even a small liner of, say, 350ft. length would be represented in 4mms. scale ('OO') by a model some 4ft. 6ins. long, so that your models of ships should be confined to barges, tugs, lighters or small oil tankers, which are of smaller size and will fit into the railway picture more unobtrusively. Such models are often procurable at reasonable prices as water-line models.

Novel Bookstand and Cupboard

EASILY constructed of ¾in. wood this novel bookshelf is designed to prevent untidiness which occurs when books are removed from a bookshelf of the usual type. The books are placed on a sloping shelf and are kept in position by their own weight. The cabinet part can be used for stationery and two of these bookshelves placed end to end would make



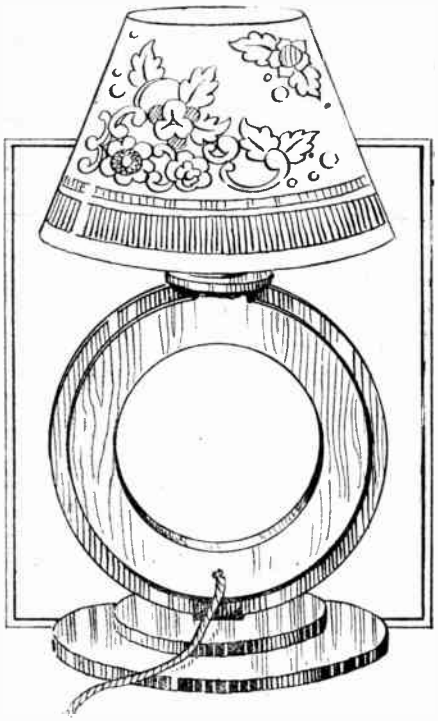


a useful addition to any writing desk. In this case the second one would have to be made the opposite way round with the shelf sloping towards the right.

If large books are to be accommodated the depth should be increased from 5¼ins. to 7ins.

Another idea for an attractive

NOVELTY TABLE LAMP



IF not wanted for personal use, the novelty lamp illustrated here would make a very acceptable gift for a friend. It is quite easy to make, and the work of construction is plain and straightforward. Some pieces of good quality wood such as mahogany or oak would be suitable, and it will be found two of Hobbies panels of wood H4 will be sufficient to make the whole thing.

The pattern for two main parts of the lamp is shown within the limits of one panel, the second panel being used for a second covering piece (A) and the base.

Now the novelty of the lamp lies in its method of make up, the flex leading up to the lamp socket being hidden in a groove within the three layers or circles of the frame.

A study of the illustrations before a start is made on the work will be sufficient to make the method clear. Two circles of ¼in. wood are wanted as (A), in Fig. 1, the central inner disc (C) of one when cut round and removed will answer for the upper layer of the base, see Fig. 2, which gives a cross section of the base made up of the two pieces.

The larger piece as (B) on the panel in Fig. 1 is 6½ins. diameter, with a disc 4ins. diameter cut from the middle in a similar manner to (A). From this latter piece two smaller discs are cut and glued to the frame. The disc shown 2ins. diameter will be glued at the top of frame (B), and over the tenon, and the smaller disc, 1¾ins. diameter will be screwed on top of this disc with a hole in the middle for the flex to protrude, and follow up to the lamp holder.

Centre Disc

Particular care must be taken in making the centre disc or frame piece (B) to get the slot carefully cut. An inner margin of wood (E) ⅜in. wide will be left and an open space or channel (F) ¼in. then marked which will leave an outer margin of ⅜in. Support the pieces well on the cutting table during cutting.

When the two side layers (A) are glued on, the piece (G) will be held securely. See that an even margin is kept all round in the gluing on, then round off the edges of the projecting inner disc. A small cross section of the three pieces is given in Fig. 3, the near side piece (A) being drawn away to adequately show the groove or channel in the middle section.

Now glue on the 2in. disc, and glue on the base to the tenon below, adding the small cover blocks each side to strengthen the joint at this place. So that the flex may emerge from the bottom of the ring, bore a hole in one side piece immediately opposite the swelling of the channel at the bottom.

Finish

Finish all edges and surfaces with glasspaper and round off the sharp edges where necessary. The wood may now be finished either with stain and varnish or coloured art enamel.

If a more or less common wood has been used then paint or enamel would make a good finish as any open joints will be well covered and should not be apparent in the finished article.

If mahogany has been used, french polish would look well, or again this wood may be lightly stained and then rubbed up with oil.

When the work of polishing or painting has been completed and all surfaces are quite hard, remove the top circular disc, which has been screwed in place.

Get a length of flex, sufficient to reach from the table to the nearest point from which the lighting is to be made, plus what will be required for the lamp itself. Push this through the hole in the ring, draw enough through to go round the channel and come out at the top. Thread the flex through the hole in the disc and then replace the latter by screwing it on.

The Fitting

Now screw the short brass barrel or sleeve of the holder in the hole in the top disc and draw the flex further through to connect up with the actual bulb holder. Draw the flex back from below to take up any slack in the groove. To the lower free end of the flex connect an adaptor ready for plugging in.

The shade support, Fig. 4, consists of a 2in. square of tin or thin brass, with a hole cut out of the centre, as shown. To this are soldered four bent wires which support the shade. Any stiffish wire will answer for these, and one of them is shown already in place in the illustration. Draw the outline of the wire on paper, getting the angle as far as possible correct.

(Continued foot of page 330)

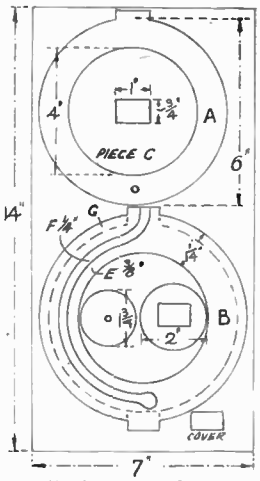


Fig. 1—Detail of parts

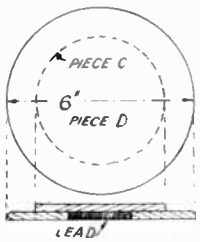


Fig. 2—Base section

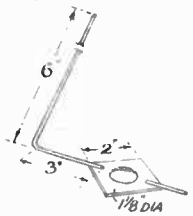


Fig. 4—The support

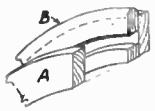


Fig. 3—The rims

Fig. 5—Shade shape

How the handyman with a family can make

A CRIB FOR BABY

THIS baby's crib can be made at a remarkably low cost and can prove snug and draught resisting for a young baby up to six months or more.

The entire crib consists of a steel frame 31½ins. by 17ins., canvas or strong fabric in three pieces. There are, one piece 59ins. by 19ins., two pieces 33ins. by 13ins. and trestle of four 3ft. lengths of wood 1½ins. by ½in. and four of 19in. lengths 1½ins. by ½in.

To begin making our crib, we first provide a frame 31½ins. by 17ins. We have two choices of frame. First a perambulator frame of the above dimensions is quite common and considered the better frame, as it already has fitted bolts to take trestle, but where both halves join, a short strip of steel bolted either side keeps frame rigid. If perambulator frame should be unobtainable, a frame can be made from strip steel ½in. by ⅛in. and bent into

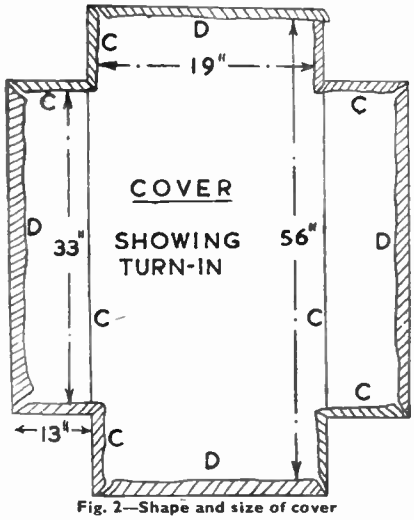


Fig. 2—Shape and size of cover

length and breadth shown and can be either joined by welding or bolted together by small steel strips.

Our next move should be the cover (Fig. 2). This probably calls for the sewing machine or a lady for stitching, which is found to be stronger when machine stitched. Our three pieces of canvas, one 59ins. by 19ins. and two 33ins. by 13ins. are now assembled and ready for stitching, allowing approximately 1in. turn-in (Fig. 2, C).

The reason for three pieces of canvas or fabric as the case may be, is that it is found to work out much cheaper and easier to obtain than a complete piece. Presuming three pieces are joined together, corners brought in and joined, we proceed to bind, cover edge to frame, frame shown (Fig. 3, A) and overlap (Fig. 3, D). This is found to be stronger when done in a blanket stitch, thus pulling 1in. overlap around frame tightly and blanket stitching. Nick small holes for trestle bolts on the frame (Fig. 3, B) and button-hole stitch these.

This should complete crib, but before we start our trestle, check on what is already done to assure ourselves that the trestle will work in conjunction with our

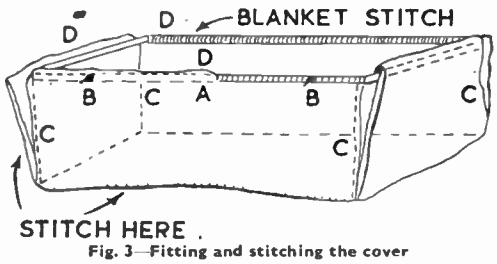


Fig. 3—Fitting and stitching the cover

crib. The width and length of the crib is 33ins. by 17ins. and depth approximately 12ins.

This completed, we begin on the trestle, by providing our four 3ft.

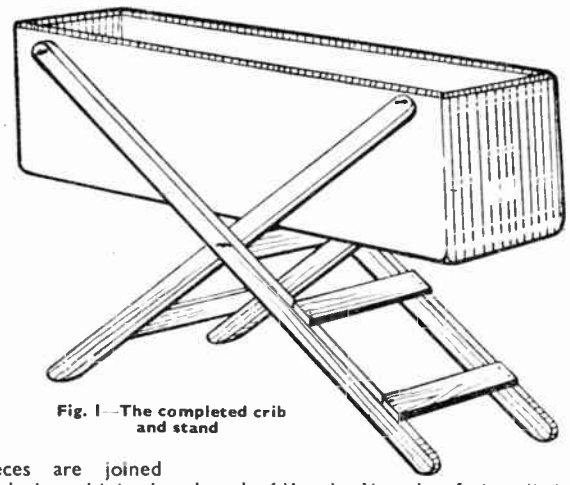


Fig. 1—The completed crib and stand

lengths 1½ins. by ½in., chamfering all the ends as shown in Fig. 1. This saves the carpet from being scratched and at the top gives better effect. This done we now fit our cross sections of 33ins. by 1½ins. by ½in. Four of these are required. For the bottom sections cut indents ½in. deep and 1½ins. width in trestle legs. Do likewise for the top cross section pieces, 9ins. apart from bottom cross section pieces. Use a good glue and also screw down with fine ½in. wood screws. Four of these are sufficient in each cross section piece. Join trestle legs together by boring ½in. holes in the centre of the legs and bolt together with 1½ins. long by ½in. diameter bolts. Also ⅜in. from the top of the trestle legs bore ½in. holes to take crib bolts. These bolts can be fitted with butterfly nuts to enable easier dismantling.

A mattress for this size of crib is easily obtainable and a useful addition to the crib would be a canopy made from ½in. wire and secured to bolts on frame. (335)

Lamp—(*Continued from page* 329)

See that both wires are alike, then solder them to the corners of the metal square. The support is then fitted to the lamp holder, the brass ring on it being unscrewed, the square dropped over it, and the ring then replaced.

A pattern must be made for the shade if this is not to be bought ready-made.

The shade may be of parchment paper or other suitable material.

The pattern is easily developed according to the diagram Fig. 5.

First draw line (A—B), then the centre line and line (C—D). Connect these points and extend them to centre (E). From here, and with radii (E—D) and (E—B), respectively, strike the arcs (D—F) and (B—G). In the centre of line (C—D), strike a 3in. diameter circle. Divide this into eight parts and measure off these parts on to arc (D—F).

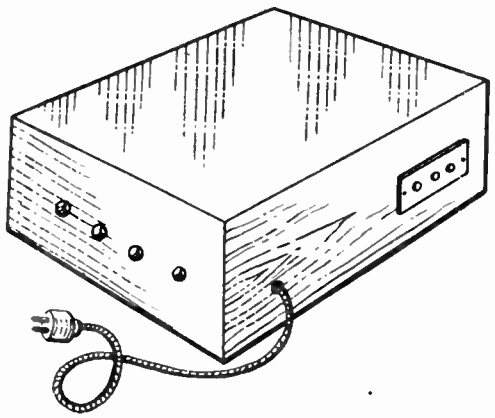
From centre (E), draw (E—G). Allow ½in. for overlap or gluing tab and cut out. Bend the material to shape and glue the tab or this may be punched with holes and stitched if so desired.

The finished decoration can be left to the worker. Some, with artistic ability can paint the shade with special paint or stains, and a type of floral design, easy to outline and colour in with a fine brush is given in the illustration.

FIRESCREEN DESIGN

The necessary wood for this week's design is obtainable from Hobbies Branches for 15/8 or sent by post from Hobbies Ltd., Dereham, Norfolk, for 16/6.

For the battery type receiver you can make an
A.C. RADIO ELIMINATOR



THIS unit is similar in size and shape to a high tension dry battery, and takes the place of the latter in operating a battery-type radio receiver, deriving current from the A.C. mains. Its cost is a little higher than that of a new good-quality H.T. battery, but it is, of course, almost everlasting. The current actually taken from the mains is extremely small, and many years of trouble-free operation should be obtained from the unit.

A transformer is used in the circuit, and this isolates the output from the mains, thereby guarding against the possibility of mains shocks.

The Transformer

The primary of this should be suitable for the house mains, which will usually be 230 to 250 volts, 50 cycles, A.C. The unit is not suitable for direct-current mains. (The latter require no transformer or rectifier, but additional care in other directions). It does not matter in the least if the primary is slightly underrun.

For example, a 250 volt transformer may be employed on 230 or even 200 volt mains. Over-running the transformer is not recommended, as it may become hot or be damaged, so the primary should not be designed for a *lower* voltage than the mains supply.

A secondary delivering about 150 volts is convenient. If the secondary gives less voltage, the output of the eliminator will be proportionately reduced. On the other hand, if the transformer delivers a much higher voltage, the output of the unit would be too high, and it would be necessary to wire a small resistor in series with the rectifier, to reduce the voltage.

Battery type valves used in receivers operated from 2 volt accumulator for filament supply should not receive more than 150 volts as high tension. Where a midget all-dry set is concerned, the maximum H.T. voltage is normally 90, but, in a few cases, 67. This must, therefore, be remembered, and the output of the eliminator reduced, if necessary, by adding a resistor, as will be explained.

The current consumption of the average battery set is not likely to exceed 15 milliamps, and may be much less, so one of the small transformers capable of delivering up to 25 milliamps is suitable. If the transformer is capable of giving a higher current, this does not mean it is unsuitable, but merely that it will not be fully loaded.

High Tension Rectifier

This is of the metal half-wave type, and one capable of handling up to about 25 milliamps at 150 volts or less, will cost only a few shillings. Note that the positive end marked in red or with a cross, is taken to the smoothing choke.

Some voltage drop will arise in the rectifier, depending upon its type and the amount of current taken. Its purpose is to allow current to flow one way only, thereby changing the A.C. from the transformer to direct-current, which is smoothed by the choke and condensers.

Smoothing Choke

Any small smoothing choke is suitable, because it will not be called upon to pass much current. A large expensive choke is not really required. Its purpose is to take the ripple out of the current coming from the rectifier, which would cause loud humming from the receiver. The higher its inductance, the more ably it will do this. The inductance is expressed in Henrys, and 5 to 10 Henrys is average. Such a choke will have a direct current resistance of around 500 ohms or so, and thus cause a further voltage drop.

As the circuit is not critical, any smoothing choke to hand can be tried, and will probably prove suitable. For very small sets, an old coupling transformer can be used. Connect to the two primary terminals in this case. The winding on a transformer will, however, be insufficiently robust for the current required by a larger receiver.

Smoothing Condensers

These are shown as C1 and C2, and will normally be 8 mfd. components. If electrolytic, they must be connected in the correct polarity, positive going to the choke and rectifier, and negative to H.T. negative. With smaller sets, condensers down to 2 mfd. can be used satisfactorily. However, 8 mfd. condensers are quite cheap.

If condensers of too small capacity are used, humming will mar reproduction. Occasionally values as high as 32 mfd. are used for C2, but in practice this scarcely seems to make a noticeable improvement over an 8 mfd. component.

Condenser C3 is really to by-pass H.T.1 to H.T. negative, and can be a 1 or 2 mfd. paper type condenser. If the receiver does not require this intermediate tapping, it can be omitted, together with the resistor R.

Building Details

After screwing down the parts, wire up as shown in Fig. 2. For the mains supply leads, use good quality twin flex, fitted with a proper mains plug.

The size may depend upon the actual components, but a base of about 5ins. by 7ins. should prove amply large. Unless the transformer is high, the front strip can be about 3ins. deep, and a complete box should be made in such a way that it can be placed over the base and front, and screwed in position. Two rows of ¼in. holes are drilled for ventilation.

A small socket strip is screwed as shown, so that the plugs on the receiver battery-cable can be inserted. Keep the choke and transformer as far apart as possible.

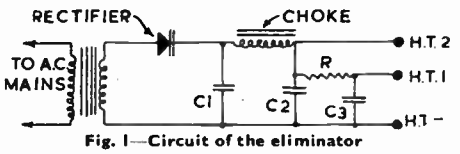


Fig. 1—Circuit of the eliminator

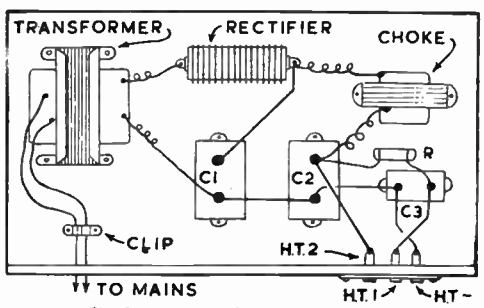


Fig. 2—The complete wiring diagram

Voltage Adjustment

The voltage output, particularly at H.T.1, will depend on the current taken. For example, if tested by a high-resistance meter, with no receiver connected, H.T.1 may be 120 volts or more, and H.T.2 even higher, but these may drop to 60 volts and 120 volts or less, when the receiver is taking current.

Fortunately most receivers are not in any way critical, as regards H.T. voltage,

and the voltage can easily be adjusted, if necessary.

Resistor R will drop 10 volts for each 10,000 ohms of its value, if 1 milliamp flows (a usual figure for detector valves, which are usually supplied with about 60 volts). Assuming that H.T.2 will be about 120 volts, then, a 60,000 ohm resistor is used, and in most cases this will be quite satisfactory.

If violent oscillation shows too much voltage is reaching the detector, use a resistor of up to 100,000 ohms or so, or connect a further resistor in series with that already present. It is also possible to use a variable resistor, so that this can be set to the required value.

If the voltage at H.T.2 proves too high, connect a resistor between the choke and C2. Here, about 10 milliamps will flow, with average 3 valve sets, so the resistor will drop 10 volts for every 1,000 ohms of its value. Again, a variable resistor is possible, but scarcely necessary, except for experimental purposes.

Measuring Voltage

If a good voltmeter is to hand, it is easy to measure the output at the sockets, with the receiver actually working, and to arrive at the figure required. Otherwise, the user can tell with sufficient accuracy by judging how the receiver works, as compared with the H.T. battery previously employed. Low voltages will show themselves by weak reproduction. Excessive voltage will cause oscillation and howling.

With a unit of this type, it is useless to measure the voltage at the sockets by means of the cheap meters which consume a high current. With these, the current drawn by the meter may reduce the voltage to such a low figure that scarcely any reading is obtained, yet when the meter is disconnected, the unit will work the receiver properly. This cannot be overcome, and arises in testing all circuits where high resistance is present. The remedy is to use a proper radio testmeter drawing an extremely small current, when accurate readings will be obtained.

Extra Sockets

Some old sets have many plugs, but some of these can usually be connected to a common supply voltage. If extra sockets are *essential*, these can be obtained by connecting a further resistor from C2 to the new socket, and wiring a 1 or 2 mfd. condenser from the latter to H.T. negative, as with the intermediate socket already present in Fig. 2.

Finally, see that the usual grid bias battery is used, and plugs inserted in suitable sockets, as the voltage here will have a considerable influence upon the volume and quality of reproduction obtained.

Some electrical problems solved in readers'

REPLIES OF INTEREST

Electrifying Rails

IS it possible for me to electrify the rails of a clockwork set so that it will be possible to use the electric train? I also require a transformer for the train, so could you possibly give me any information on this at the same time? (D.M.—Corby).

THE current pick-up for an electric train is obtained from the wheels and a centre shoe which runs on an insulated rail placed centrally between the rails upon which the wheels run. It might be possible to add this third rail by fixing small bolts to the sleepers, using insulating washers for each, and soldering lengths of 14 S.W.G. or similar straight stiff wire to the bolt heads, but a sound job should be made if the train is to run properly. Take one connection to centre rail and other to usual rails. If the engine has a wound field, it will operate from a mains transformer, the primary of this being suitable for the house mains. It is understood engines have been made with 6 and 20 volts motors. It would be wise to try 6 volts, increasing this if the motor does not run. Dry batteries are unsuitable, but an accumulator could be used. Transformers will not function on D.C. mains. If the engine motor has a permanent magnet, it will not function from a transformer with A.C. mains, and batteries must be used.

• • •

Battery Charging

I WANT to charge batteries with D.C. current. How do I go about it? (H.L.—Portadown).

CHARGING from D.C. is very easy, and the polarity will be found marked on the mains-supply plugs or sockets. The connections to use are as follows:—Positive mains socket to mains-type lamp-holder. Second lamp-holder screw to Positive on accumulator to be charged. Negative of accumulator to Negative mains socket. The charging rate in amps can be found by dividing the mains supply voltage by the wattage of the lamp in the holder. For example—240 v. mains and 120 watt lamp equals ½ amp. Usually the circuit may be arranged to make use of a lamp already employed for some useful purpose. If more than one battery is to be charged, connect batteries in series, Positive on one going to Negative on the next, and so on. Do not handle any bare leads or other connections without first withdrawing the mains plug to disconnect supplies.

• • •

Radio Controlled Models

I AM enquiring if you could supply me with data on a radio-controlled boat model. (F.D.H.—Ferryhill).

FOR radio control of models, a minimum of 2 to 3 valves are required in the transmitter, and a similar number in the receiver; both must work on one of the frequencies allocated by the G.P.O. To set up the circuits satisfactorily, a fair working knowledge of wireless is desirable. The transmitter can consist of any radio frequency oscillator working on the assigned frequency (preferably crystal controlled to prevent any chance of the circuit straying on to other frequencies), followed by one or two radio frequency amplifiers. The normal method of control is to provide oscillators which enable the radiated signal to be modulated with audio-frequency tones, one for each item to be controlled in the model. The receiver consists of a detector and one or more amplifying stages, with filter circuits permitting the audio-tones to pass to individual relays, which open or close according to whether the appropriate tone is transmitted, thereby switching motors which drive the model or operate rudder, etc. (Occasionally rudder is controlled by electro-magnets similarly operated). The normal range of operation would be up to a few hundred feet, depending upon amount of amplifiation, number of valves, etc. At present the G.P.O. is only permitting such operation on micro-waves and ultra-short waves, and the Postmaster General should be written, enquiring what frequencies may at the moment be adopted to ensure illegal transmission does not take place.

• • •

Pick-up Addition

MY AC/DC radio has no pick-up sockets. Can you tell me how to fix them? (R.T.M.—East Ham).

TO connect the pick-up you will need to take two leads to the receiver. One should go to the metal chassis. The other will require to go to the grid socket of the output valve, or to the grid socket or cap of the valve preceding the output valve. (Each can be tried, to determine which is best with the particular receiver). As you do not give sufficient details of the valve-types it is not possible to state which is the correct socket. This may be found from valve lists, by following the receiver wiring, or by having a local radio shop indicate the points in question. If it is desired to ensure no mains voltages reach any metal parts of the pick-up, a condenser of about ·1 mfd. may be connected in series with each pick-up lead.

The amateur handyman should know these

HINTS ON FILING METALS

TO deal fully with metal filing is beyond the scope of an ordinary article, but the few hints here described will be found very useful.

For a guide where a piece of work requires heavy or rough filing, a file with fairly coarse cut teeth should be used. The method of rough filing metal is described in the following manner with the aid of view (A) Fig. 1, of the accompanying illustrations.

Much depends upon how the file is held if the work of heavy filing is to be done with more or less ease. The left hand should grip the end of the file, as indicated in view (A) Fig. 1, and the right hand should firmly grip the handle. When filing do not use the file in a see-saw manner, take firm strokes, keeping the file flat and use pressure and force in a forward direction indicated by the arrow. Relieve the pressure and force on the backward stroke, simply allowing the file to trail over the surface of the work.

For light filing a slightly different application is needed if the work is to be a success. A file with medium cut teeth is used for light filing, and the file is held at the end with the grip made by the thumb and finger tips, as indicated by view (B) Fig. 1. Use less force and pressure as applied for heavy filing, but the required pressure is made likewise on the forward stroke in the direction of the arrow.

Light filing is done after heavy filing in order to get the coarseness of the surface reduced, and at the same time making quite sure it is made true to the square.

Finish filing is done with a fine cut or smooth file, and the file should be lightly held. The fingers of the left hand are simply held on the end of the file, as indicated in view (C) Fig. 2. Hold the file lightly by the handle, and like the previous cases, the cutting is done in the forward direction indicated by the arrow. Only very slight pressure should be applied, and the file should be lifted slightly off the work on the backward stroke.

In some cases mechanics finish off the surface of metal by a method known as drawfiling. A smooth cut file is used for drawfiling, and the file is held in the manner indicated in view (D) Fig. 2. Keep the file quite flat on the work, and with even light pressure draw it along the surface forward and backward in the direction indicated by the arrows.

Unlike previous filing operations already described, the pressure is maintained on the forward and backward strokes, the file being allowed to cut in both directions. When the surface is treated with the file it is the usual practice to finish it off with fine grade emery cloth, the cloth being folded round the file and the work done in a drawfiling manner.

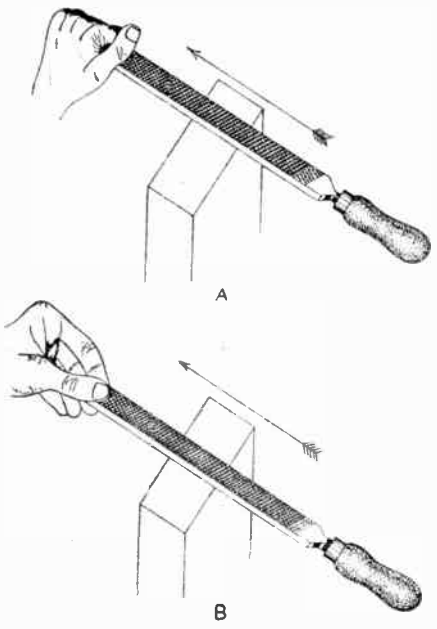


Fig. 1—Heavy and light filing

Two further hints on filing may be of interest to many readers, and these deal with filing out holes and curves in metal. The method of enlarging a hole is described with the aid of view (E) Fig. 3. The end of the round file is best held as indicated in view (B) Fig. 1, the handle being gripped in the usual manner. Commence filing the hole with firm forward strokes in the direction of the arrow, and at the same time turn the file in a clockwise direction as indicated by the curved arrow.

Practice the art of keeping the file square with the work and remember to take off pressure on the backward stroke. Whenever possible it is better to slightly change the position of the work in the vice, in order to keep the pressure on the metal during filing the hole.

When filing out a curve as indicated in view (F) Fig. 3, the method is the same as described for filing a hole. The work of filing a curve, however, is usually done with a half-round file, although with practice quite good results can be obtained with either half-round or round. (349)

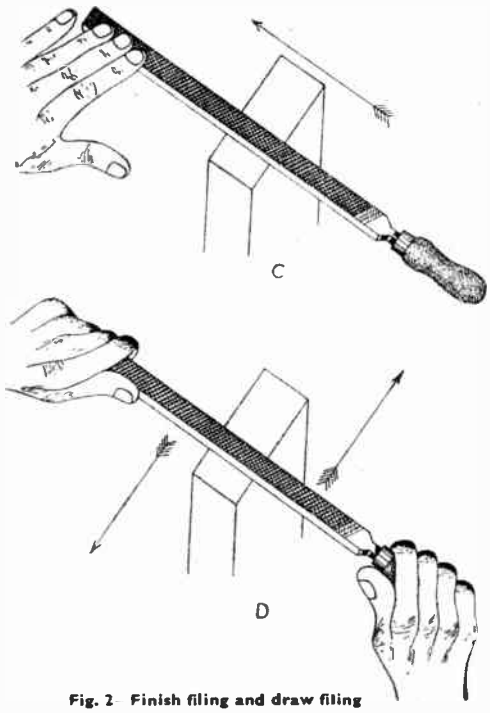


Fig. 2—Finish filing and draw filing

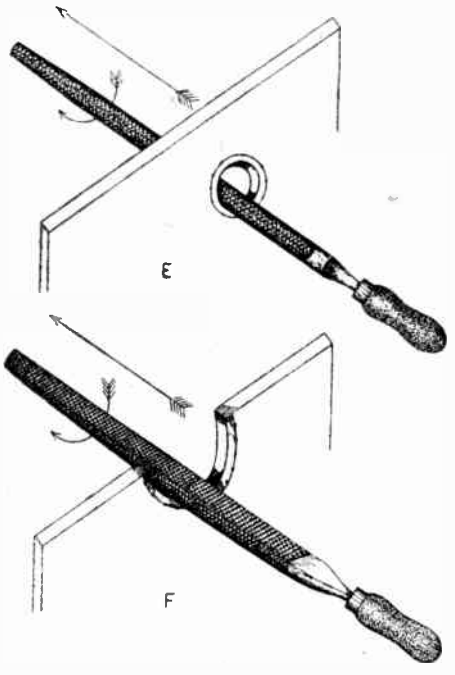


Fig. 3—Filing holes and curves

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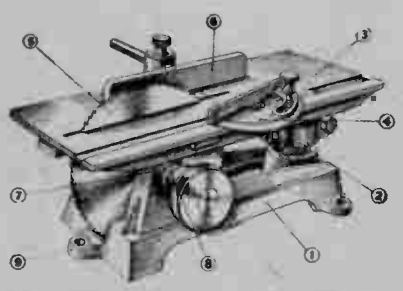

Note also that direction of saw now clockwise to take advantage of greater length of table and provide greater protection as saw now working behind the pillar supporting the table instead of in front of it.

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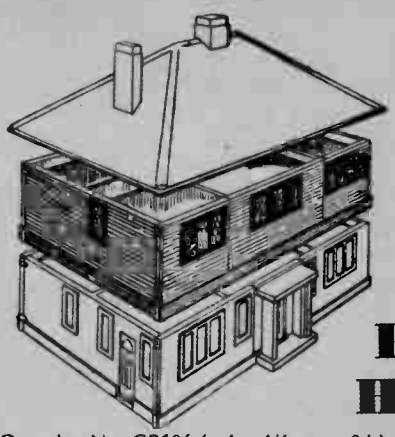

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Hobbies WEEKLY

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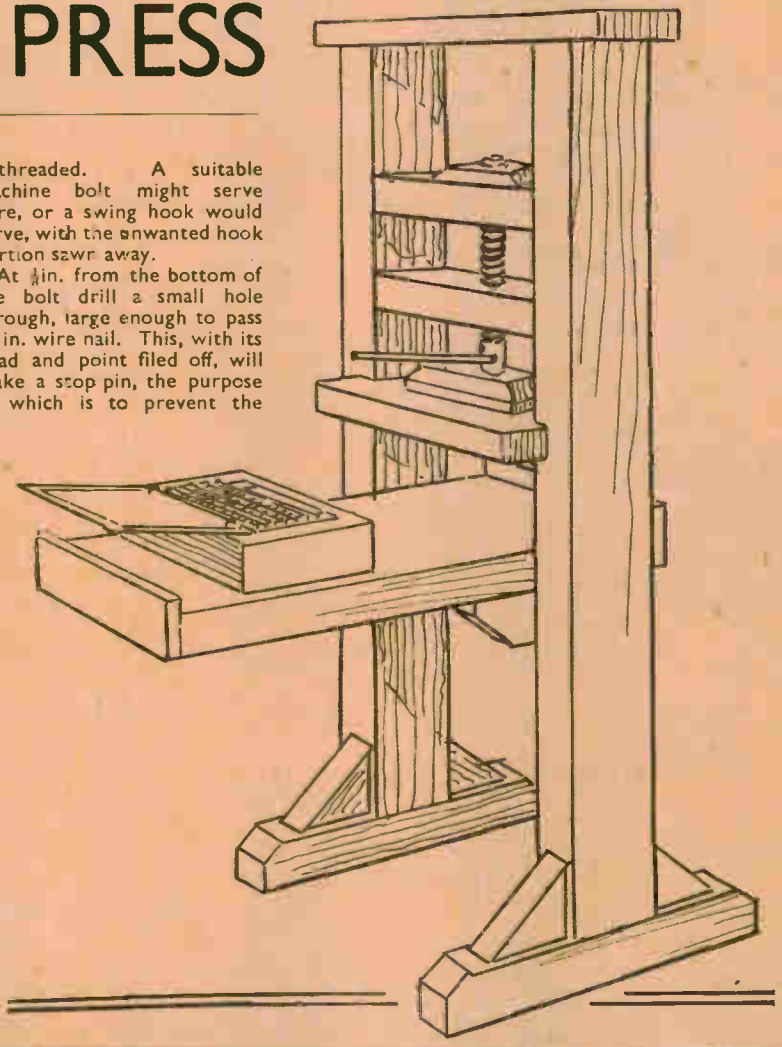
February 28th, 1951 Price Fourpence Vol. III No. 2887

A MODEL PRINTING PRESS



THIS is an interesting model to construct, especially for exhibition purposes. An added interest is the fact that it is capable of really doing a printing job, though, naturally, a small one. Its construction presents no difficulty and it should prove a fascinating job of work.

Fitting

A front and side view of the model are shown at Fig. 1. The actual length and thickness of parts, not given in the text, are provided in the cutting list at the end of the article. The upright posts are mortised and tenoned into the feet and top crossbar. The bars (A) and (B), through which the screw, which operates the platen (C) works, are also tenoned into the posts.

The table supports (D) are grooved into the posts just ¼in. deep. The angle brackets between feet and posts are cut from ¼in. thick wood, and are nailed and glued in place. The rest of the joints mentioned are fixed with screws, not nailed and glued, so that all can be taken apart if repairs or adjustments are necessary. Round-headed screws should, for preference, be employed; they are not so unsightly as the flat-head type in a model.

The Screw

Remove bars (A) and (B) and in the centres of them bore ⅜in. or ½in. holes through for the screw. This can be a bolt, either ⅜in. or ½in. and 4ins. long, exclusive of head, which should be cut off. About 1½ins. of this should be unthreaded. A suitable machine bolt might serve here, or a swing hook would serve, with the unwanted hook portion sawn away.

At ¼in. from the bottom of the bolt drill a small hole through, large enough to pass a 1in. wire nail. This, with its head and point filed off, will make a stop pin, the purpose of which is to prevent the

bolt leaving the platen when raised or lowered. At ½in. above this hole, drill a ⅛in. hole through the bolt, and another ⅛in. hole directly above this, at right angles to it. These holes are for the lever to act in for turning the screw.

In the top of bar (A) cut a recess round the bolt hole into which the nut, belonging to the bolt, can sit. Cover this with a 3in. by 1½in. length of ¼in. wood. This part is, of course, bored to fit the bolt, and is glued over (A) and strengthened with a screw, either side of the nut, as in detail Fig. 2. Now to make the platen (C).

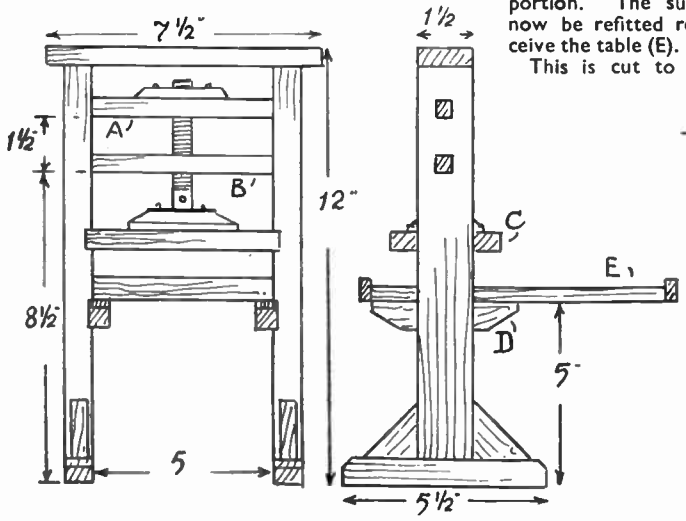


Fig. 1—Front and side view of complete model

The Platen

This is shown in plan and side section in Fig. 3. It consists of two pieces of wood, joined together, the upper piece carrying the screw. Cut the lower piece to dimensions given in the plan, and at each end cut away pieces, as shown, ¼in. thick, to pass over the posts. The surfaces of this part should be planed quite flat.

The upper piece is smaller, shown by the dotted rectangle, and in its centre, top surface, a 1in. diameter recess is cut out, ¼in. deep, with a centre bit. Bevel off the edges, as in the drawing. From a piece of sheet metal, about $\frac{1}{16}$in. thick, cut a rectangle the size of the flat portion of the wood, and in its centre drill a hole to admit the bolt, and a small hole at each corner for fixing screws.

At the bottom of the recess in the upper part of the platen lay a disc of thin metal to prevent the bottom ends of the bolt indenting the wood under pressure. Push the bottom end of the bolt through the metal plate and insert the stop pin to prevent its withdrawal. Now screw the plate to the wood and see that the bolt can rotate easily. If tight, then bore the recess deeper.

All being satisfactory, remove the table supports (D), replace bars (A) and (B) and work the bolt through them with the fingers. See the platen rises and falls smoothly, then screw the upper part, holding the bolt, to the lower portion. The supports can now be refitted ready to receive the table (E).

This is cut to dimensions given in the cutting list, and at each end a ¼in. by ⅜in. strip of wood is glued and nailed to form end rims. Place in position between the posts, let the rear end project just 1½ins. beyond the posts, and fix with two screws, each side, through the posts.

CUTTING LIST

Posts (2)—12ins. by 1½ins. by ¾in.
Feet (2)—5½ins. by ¾in. by ¾in.
Top bar—7½ins. by 1½ins. by ½in.
Bars (A) and (B)—6½ins. by 1½ins. by ⅛in.
Supports (D)—4ins. by ¾in. by ⅛in.
Table (E)—8ins. by 5ins. by ½in.
Lower platen—5½ins. by 3½ins. by ½in.
Upper platen—3ins. by 2ins. by ½in.
Panel of ¼in. fretwood—4ins. by 9ins.*
Smaller items from scrap
*For economy's sake the end rims of table can be cut from the panel in two pieces for each and joined end to end.

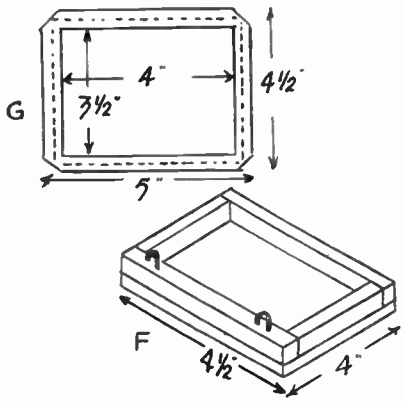


Fig. 4—Type box details

Type Box

The chase or type box (F) in Fig. 4, is a rectangle of ¼in. fretwood. Strips of wood, ⅜in. thick and ½in. wide are firmly glued and screwed to it, making a shallow tray to hold the type. A metal frame is now made to the size given at (C) from tinplate. This is to hold the padding between the type and flat base of the platen, to even out the impression.

Bend the short sides of the frame over at the dotted lines (midway) to make a pair of grooves into which the padding, in this case a thin sheet of smooth card covered with one or more sheets of white paper, can be slid. The front long side is bent over and hammered down flat, the rear one bent under and also flattened, so as not to prevent a free passage to the padding. In the front side at ½in. from each end punch a hole through.

Lay this frame on the type box, and where the holes are punched, prick through to the wood underneath with an awl. Remove, and in these holes drive a pair of small staples partly in, one leg of each only being driven into the wood. File off about half of the other legs, leaving two pins, with bent upper pieces, as in the drawing at (F). The frame can now be pushed over these pins, and should lie flat on the type bed.

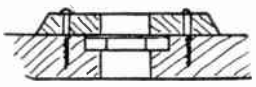


Fig. 2—Section detail

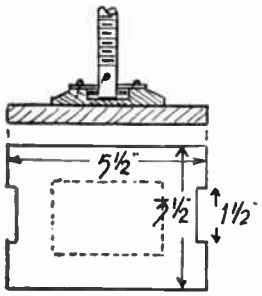


Fig. 3—The press parts

Now test the arrangement. Firstly, for turning the screw, provide a 4in. length of ⅛in. steel rod, which is inserted in the most convenient hole in the screw and moved sideways. Place the type box under the platen, and the latter should, under pressure of the screw above, press on the frame evenly, and clear the pins on which the frame is held in place. All being well, the model is ready for work.

The depth of the type box precludes the use of standard printer's type, but it may be possible to obtain a printing outfit in which the type is of metal, not rubber, but about ¼in. in length. Such outfits used to be made for stamping names and addresses, using a black oily ink, and may be still obtainable.

If not, an ordinary set of rubber type can be bought and used, but a light pressure only should be employed. The press could also be used, up to its capacity, for taking prints from lino blocks.

In use the paper is laid on the frame and kept in position while the frame is swung over to the type faces with the forefingers. It is then, after the type has been inked, pushed under the platen and the impression taken. (358)

For home, office or shop this is a practical
TELEPHONE BRACKET

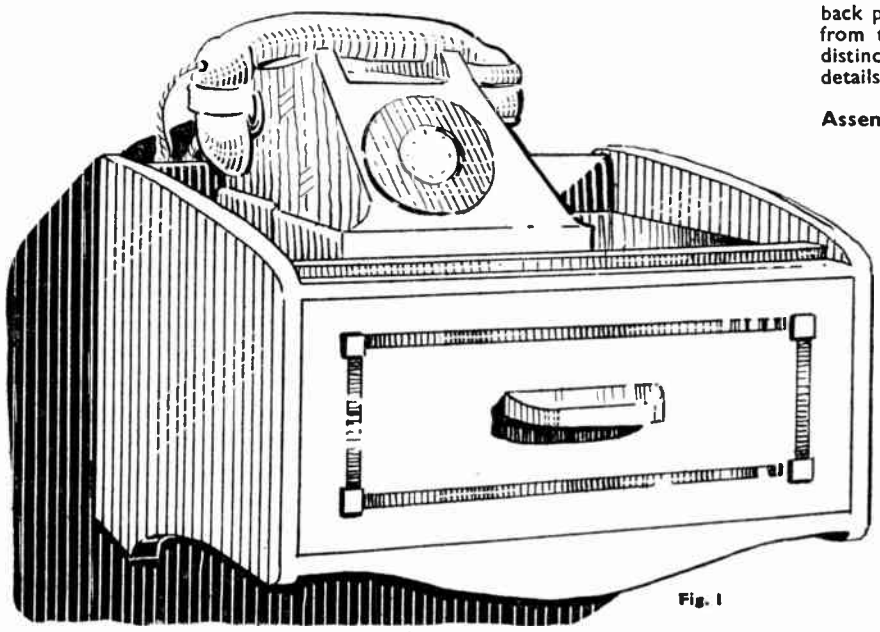


Fig. 1

WE have been asked by a reader for a design and constructional details of a bracket fitment for a home telephone. He mentions that he would like a drawer incorporated in the design in which a couple of pairs of gloves may be kept.

Now, this idea may appeal to a good many of our readers and workers, and some will, doubtless, make a little pocket money by making up some brackets on the lines shown and described here.

Careful measurement has been taken of an ordinary telephone instrument, and our details have, therefore, been based on these measurements, with a view also to economy in wood and simplicity of construction.

The overall size of the article is, length approximately 12ins., width from front to back 9¼ins. and depth 9ins. The drawer is of useful size, being also based on measurements taken from a large-size pair of gent's gloves.

Practical Outlines

The whole fitment, as can be seen from Fig. 1, is purposely kept plain in outline and with but little shaped work introduced to add just a touch of character and style. The stained or inlaid banding on the drawer front need not, of course, be included unless desired, a plain polished or painted front would, doubtless, look almost as well.

It has been considered a good point in the design to have the wiring of the instrument carried down the back of the bracket and thus kept as far as convenient out of sight. This is brought about by having the actual wood panel forming the back, set in ⅜in. from the back edge of the main shaped ends.

This method also makes for strength, as the screws forming the fixing of the back panel to the ends are kept well in from the edges of the latter. This is distinctly seen in the two constructional details Figs. 2 and 3.

Assembly

The method of assembling the bracket may be briefly described next, and we think, this, in conjunction with the full cutting list of wood required, should greatly simplify matters for the worker in making this useful article. The two shaped ends (A) are made first, and shallow grooves are to be cut in them to receive the top shelf (B).

Now the simplest way to form these grooves is by cutting them so that they run through at the back, as seen in Fig. 2. Where the top shelf is stopped off at the front, just before reaching the edge of the ends (A), the groove is cut down neatly with the chisel.

The tenon saw, in cutting the grooves can then be brought up to this point and the unwanted wood easily cleaned away.

Back and Shelf

It will be seen later when the back panel is fitted that the tail end of the grooves are not seen. If the grooving or housing, as it is termed, is carried out as above, it will be noted that the top shelf (B) must be notched out at its front corners to fit into the grooves in the ends (A).

Below this shelf the rail (C) is either housed into the brackets, in a similar manner to the shelf above, or simply butted up and screwed through at the ends, the heads of the screws being countersunk and afterwards filled with stopping.

Another, and cleaner method, perhaps, would be to insert round dowel pins into the ends of the rail, the dowels being dipped in glue and driven home

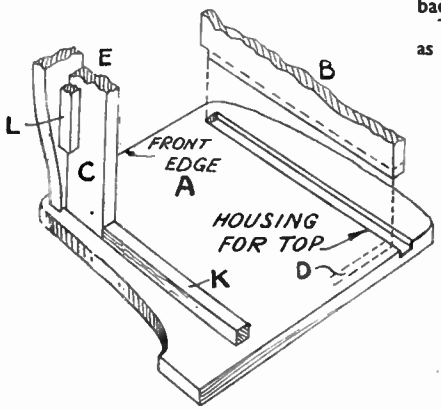


Fig. 2—Under view of parts

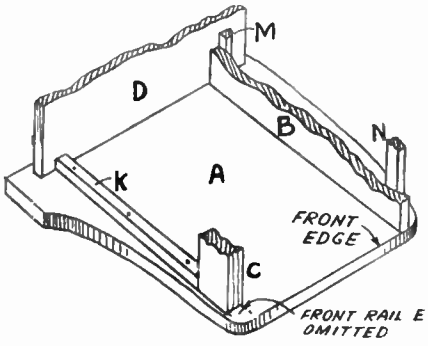


Fig 3—Further construction

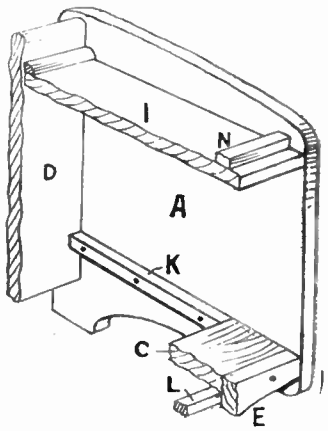


Fig. 4—End view inside

and the projecting heads cleaned off flush. The back (D) is a plain panel of wood, simply fitted to go between the ends (A), to which they are screwed or dowelled.

Along the front of rail (C) goes the front shaped rail (E). This is simply screwed on with its top edge flush with the top surface of rail (C), as seen in Figs. 2 and 4. Countersunk screws are again used here with heads filled.

The Drawer

It now remains, before making the drawer, to add just the few smaller items, (K), (L), (M) and (N) to the almost completed box. Piece (K) is a fillet of square wood screwed to the inside of the ends between rail (C) and the back (D). There are two, of course, and they form the runners for the drawer. Pieces (L) are simply stiffening blocks glued in the angle at the back of rail (E) and under (C).

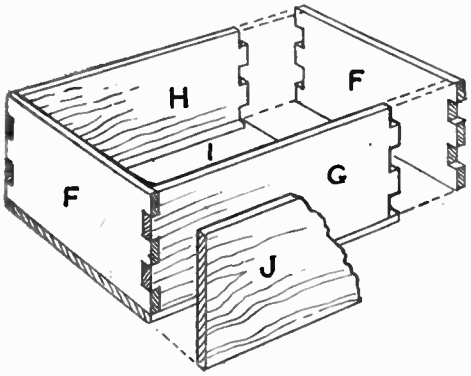


Fig. 5—Drawer construction

The quarter round fillet (M) is optional but adds to the finished appearance of the back and prevents the instrument from contact with the top of the back panel. Fillet (N) is required to hold the front of the instrument steady on the shelf while the receiver is being lifted.

All the foregoing pieces are glued firmly and either screwed or nailed with fine nails. The top edge of the back panel (D), it will be observed, is rounded off neatly and smoothly.

The Drawers

This needs but little explanation, as the sectional diagram Fig. 5 fully illustrates its method of construction and assembly. The rails (F), (G) and (H) are lock-jointed together to make a firm glued fixing and the floor (I) simply laid over it and screwed or pinned to it. The panel (J) is made to correct size to fit on the front of the 'box' by standing the latter upright on a panel of wood and carefully scribing round it. A perfect fit is thus assured, and after cutting round and gluing to the front (G), all edges may be glasspapered off and all surfaces made level and smooth.

The drawer may be found at first to be a tight fit into its opening, in fact, it might not enter at all until each of the sides and top have been rubbed down on a sheet of coarse glasspaper, with a finishing of fine paper. Thus the construction of the fitment, and a few further remarks may be added regarding the shaped parts.

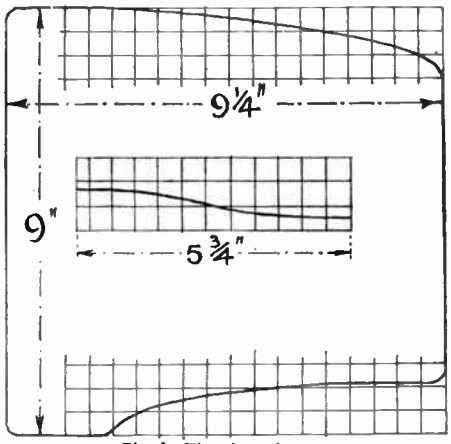


Fig. 6—The shaped ends

The Ends

In Fig. 6 is given an outline of one of the ends of the 'box', with ½in. squares drawn over these parts which are to be shaped. It should, therefore, be a simple matter to draw in the squares with tee square and set square, or a try square; and follow the simple curved line through them to get a correct outline.

The same remark applies to the half section of the front rail (E), half only of which is given. When the half has been lined in, trace it on to thin paper, then reverse the latter, placing it to a common centre line and put a piece of carbon paper beneath it and proceed to draw in the second half. Transfer the completed outline to the wood and cut round in the usual way.

Referring again to the outline of the bracket ends of the 'box', it will be understood that a piece of wood cut square and to size 9¼ins. by 9ins. will first be made, and the paper tracing of the curved top as well as the lower edge, be laid in place on the wood with carbon paper beneath for transferring the lines to it.

The one cut-out end can be used as a template for drawing round to complete the second end.

Finish

The matter of finish to the wood is largely dependent upon the sort of wood used. If oak is obtainable, this would be ideal and a stain and french polish finish is best, or the surfaces may be stained and waxed polished, The cutting list will be found most useful to the worker about to make up the telephone fitment.

(354)

CUTTING LIST

Side (A)—Two—9ins. by 9¼ins. by ½in.
Shelf (B)—One—11½ins. by 8½ins. by ⅝in.
Shelf, if housed ⅛in. into Sides (A) will be 11⅜ins. by 8½ins. by ⅝in.
Rail (C)—One—11½ins. by 1½ins. by ½in.
Rail, if housed ⅛in. into Sides (A) will be 11⅜ins. by 1½ins. by ½in.
Back (D)—One—11½ins. by 8ins. by ⅜in.
Rail (E)—One—11½ins. by 1½ins. by ½in.
Drawer Side (F)—Two—8⅛ins. by 4⅜ins. by ⅜in.
Drawer Front (G)—One—11½ins. by 4⅜ins. by ⅜in.
Drawer Back (H)—One—11½ins. by 4⅜ins. by ½in.
Drawer Floor (I)—One—11½ins. by 8½ins. by ½in.
Main Front (J)—One—11½ins. by 5ins. by ½in.
Runners (K)—Two—6½ins. by ½in. by ½in.
Angle Bend (L)—Two—10⅜ins. by ½in. by ½in.
Angle Bend (M)—One—11½ins. by ½in. by ½in.
Shelf Fillet (N)—One—11½ins. by ½in. by ½in.
Stiffening Fillet (O)—One—4ins. by ½in. by ½in. spare from (E).
Drawer Handle—From odd spare wood.

Leaded Windows—(*Continued from page 341*)

where the window treated belongs to a bathroom or lavatory, where privacy is necessary. The colour is applied to the inside of the window, dabbing it on with a piece of rag, until the desired tint is obtained.

Admittedly such methods of application rather messes up the fingers, and a cleaner system of colouring is to use the dabber, shown at (E) in Fig. 2, and mentioned before. A piece of tin or even an old postcard will be handy here to use as a protective screen to prevent the colour spreading beyond the pane or division intended.

There is another use for this lead, and that is to hide a joint between two panes of glass, say, in such cases when two or more smaller panes are used to glaze a window in place of one large enough. Large panes become expensive, and it may be unnecessary to buy one if some smaller ones are to hand.

For example, in design (B) a large window was filled up with four smaller panes of greenhouse glass, which happened to be available. The joints between were at places lettered (a-b-c) and these joints were covered both sides with the ⅜in. strip. The rest of the strips were of ½in. wide stuff.

It will be noticed that the simple design embodied the jointing strips, and there is no sign whatever that four separate panes of glass, instead of one were used. Of course, some diagonal leads could have been added here, or other additions to the design, but it was desirable to obscure as little as possible of the light, hence the open centre part.

Altogether, the work is very interesting, and any reader seeking a fresh craft, and we all like a change sometimes, may well try this leaded light work, which is not confined solely to windows but can be used to beautify the glass panels of a cabinet or book case, or to adorn a spare pane of glass for use in a fire screen.

The handyman can beautify his home by making

SIMPLE LEADED WINDOWS

MOST readers have seen those artistic leaded windows in country cottages and old houses, and sometimes in the modern houses about. These impart a charm that can be very pleasing. The construction of these windows by the conventional methods is difficult, but a much simplified system is now available, whereby the merest tyro can do the work successfully.

It consists in cementing specially prepared strips of lead to the glass, quite an easy work, and the results look quite as well as the professional job. The lead, cement and colours can now be obtained from many hardware shops, and an interesting job it is to apply the lead to one's own windows, and gain that quaint, cosy effect that leaded glass seems to give.

It will be understood that the lead can be applied to the glass as it is, after cleaning, of course. The possible designs are endless, but readers would be wise to choose a simple one to start with.

Designs

Two samples are given in Fig. 1, at (A) and (C) and it is entirely optional on the reader's part whether he accepts the designs as they are, or in the case of (A) omits the central ornament, and in (C) ignores the border. A sheet of designs can also be bought for a few pence.

The only tools required are sketched at Fig. 2. (D) is a wooden peg, with half the double prong sawn off. It is used to press the lead into close contact with the glass. (E) is a stick of wood, with a small pad of cotton wool, covered with a piece of rag at each end, for applying the colour to the glass afterwards to give the 'stained' effect if desired.

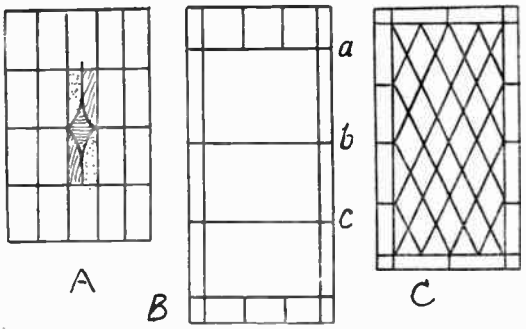


Fig. 1—Some simple patterns to use

Marking Out

To commence the work, cut a sheet of thin white paper to the exact size of the pane, and on this draw the chosen design. Use a thick pencil for this, one of those blue or black parcel pencils would do nicely. The design is then stuck to the inside of the window with a spot or two of gum, just enough to keep it in place, and no more.

You want a small table now, on which the lead may be laid, and carried out near the window. The lead is supplied in two sizes, ¼in. and ⅜in. strip, and readers can choose the size they prefer. The roll of lead is pressed into eight strips, which can be torn off as required, quite easily.

Fixing the Strips

Calculate roughly the length of lead needed for the job and cut off the roll. The cement should be stirred up a little with a wooden stick, and be then applied thinly to the back of the strips. The stuff is thick and sticky, so a soft brush is useless for spreading it on; what is needed is a hog's hair brush of the small size, such as house painter's use.

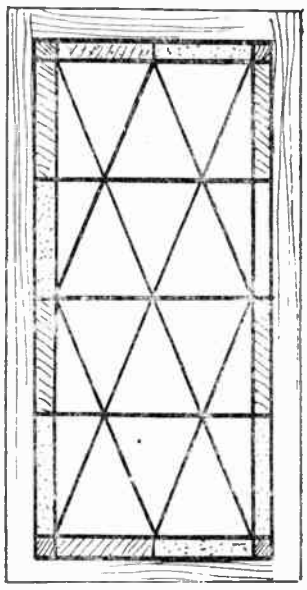
Tear the strips of lead off as required, tearing not sideways, but away from you. Pull the lead straight (it will curve a little as torn) and press it down to the glass bit by bit. Follow on with the wood peg to make it adhere well. The cement will get on the fingers during the work, and it is best to keep a rag at hand, moistened with paraffin or turps, to wipe the fingers clean now and again, to avoid soiling the glass.

Curves

Curves in the design are easily managed, the lead bending quite easily, but the inner edge of it will cockle up and should, therefore, be pressed down at intervals to make it adhere. Afterwards, the wrinkles can be smoothed out by gently rubbing over with the peg.

No cut ends must be left uncovered, as these may catch up when the glass is being cleaned. Those at the extreme sides are covered by a flat strip of lead, supplied with kit of materials, and is cemented and rolled on like the rest. Applied round the window, it not only covers the cut edges mentioned, but imparts a finished appearance to the work. The inside cut edges, such as occur in design (C) are covered by the inner strips of the border.

Some sequence is, therefore, necessary in laying the lead to ensure covering the ends properly. No difficulty, whatever, arises over design (A) but it should be apparent that the central ornament must be applied first, in order that the subsequent strips can hide the ends of the curved portions in the middle.



Diagonal Patterns

In design (C) the diagonals are laid first, then the short horizontal bits, and top and bottom vertical bits, which reach to the edges of the pane. Follow on with the border strips and finish with the binding lead.

In most designs, the lead strips, perforce, pass over each other, and they should be well pressed down to contact closely, as in detail (F) in Fig. 2. The sharp edges of the peg will be most useful here to mould the top lead over the one beneath. As the work progresses, a sharp eye should be kept to see if any parts of the lead strip rises from the glass, and such parts be pressed well and firmly down again.

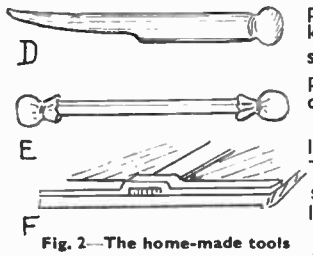


Fig. 2—The home-made tools

When the work is completed, leave it alone for an hour or two. Then clean any surplus cement, squeezed from pressure on the leads, quite off with a rag, just made moist with paraffin oil or turps.

It is as well not to disturb the finished job for a while as the cement may take some time before setting hard. Another point is not to apply the lead to the glass directly it is cemented, but rather to allow a lapse of an hour, or even two, for the stuff to get tacky.

Stained Glass

With the kit of materials is included a tin or two of coloured varnish, for those wishing to include a stained glass effect. This is especially to be recommended

(*Continued foot of page* 340)

Decorate your walls with simple
BORDER STENCILLING

DISTEMPERING the walls of houses is becoming increasingly popular, not entirely due to the scarcity and expense of wall paper, but rather to the fine colourful quality of the modern product. But no distempered wall really looks complete without a border to finish at the ceiling.

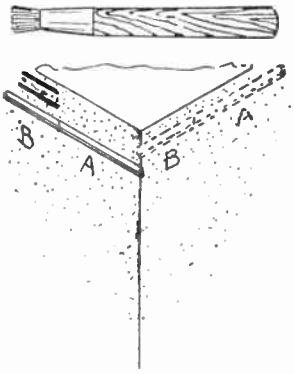
It is true that a fanciful decorative paper border can now be bought, but this can be comparatively expensive, too, costing, perhaps, as much as the distemper, and though it looks nice enough to finish off wallpaper, it seems incongruous in company with distemper. In short, it does not suit.

Simple Designs

An alternative to this is to stencil a border, either with flat paint, or distemper itself, the latter, of course, of a contrasting or harmonising colour. The necessary stencil can quite easily be cut, and the actual work of stencilling is simple enough. At Fig. 1, a group of four simple designs are given, though, of course, artistically inclined readers may prefer to design their own.

A strong cartridge or manilla paper is about the best material to use, and the only implement a sharp pointed knife. In the absence of a proper stencil knife, an ordinary pocket knife serves quite well. It soon blunts, however, and a strip of wood, to which a piece of fine emery cloth has been pinned, should be kept handy for putting and keeping an edge on the knife.

A piece of thick glass should also be provided to support the paper on while



cutting. It is the glass, of course, that soon blunts the knife, but it is necessary to get a clean cut edge on the pattern, and the glass underneath helps in the matter.

Cut the paper to the outside dimensions of the chosen pattern, pencil on it the area to be devoted to the design, and divide lengthwise into spaces of 3ins. each, or in the case of the second design down, the old but popular 'key' border, spaces of 2ins., one for each complete 'key'. To this latter design add six lines ¼in. apart, then the border can be quite easily copied. The other designs are simple enough to be copied freehand.

Cutting the Pattern

Lay the paper on the glass, and cut out the pattern with the knife. Let the paper slide over the glass, as the direction of the cuts makes necessary, but always hold it quite firmly by pressure of the fingers, as should the paper slip, the knife may leave the lines and cut away where not wanted.

Take great care also that the knife slips not when cutting the narrow ties, which divide the component parts of the pattern, though if this should happen, an effective repair can be made by the use of adhesive tape. Those circular spots could be more easily cut by the use of a suitable punch, holding the paper on a piece of hardwood for the purpose.

Varnish

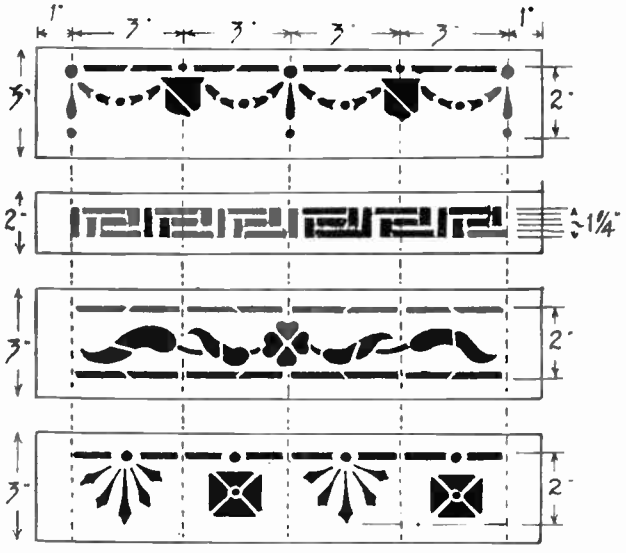
When the design is fully cut, the stencil should be given two or more coats of varnish, to help it repel the water in the distemper, and cause it to last out, at least for the job. When the varnish is quite set, the stencil is ready to use. Whether flat paint or distemper is to be employed for the work, the stuff should be thick, say, of a pasty nature.

Oil paint is not recommended, as the oil tends to spread out under the pattern and soil the surface, besides blurring the lines. Whichever is chosen, it should be, naturally, of a different colour to the rest, or at least a darker tint.

An ordinary paint brush is no use for stencilling, as the brush is not drawn over the work, as in the usual practice, but dabbed on. There is no need, however, to really purchase a proper brush, though one would last for a long time come to that, if the reader has a worn paint brush about.

This can be cut across, leaving the bristles ½in. long, and flat across the end, not pointed. In Fig. 2 the ideal form of brush is sketched at the top, and will give a good idea of what is wanted.

The patterns are repetitive, and could be laid against the wall, and shifted along



as done, until the whole length is completed. This method, however, often results in some smudging, as the paper stencil contacts some parts of the design just done. A safer plan is to do alternate portions round the room, and then to return over the ground, and finish the blank spaces. Each length of pattern is just 12ins. long, so if a 12in. space is left between each on the first round, the second round will fill in accurately.

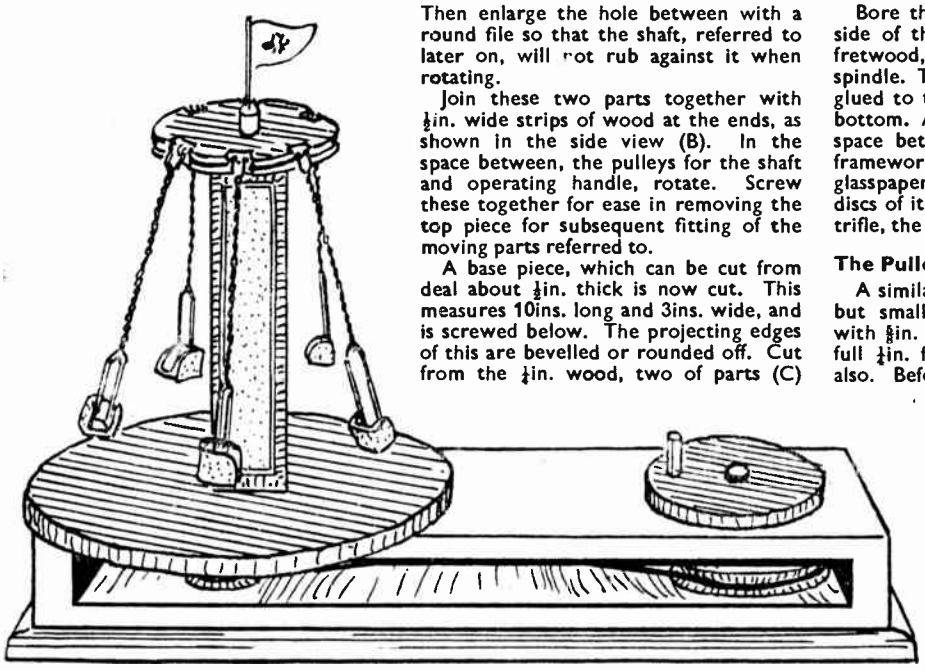
Measuring Strip

If this is adopted, use a 12in. strip of wood for measuring off. When the corners of the room are reached, the accurate space to leave can be measured with the stick by pencilling the distance on it from the end of the pattern just stencilled to the corner (call this A), and then laying it to the other side of the corner, where distance (B) is the remainder.

When the whole is finished, go over the border carefully, and make good with the brush any defects that may have occurred. The job should then look well and be worth all the trouble expended. (379)

Some odds and ends complete this working

MODEL CHAIROPLANE



AN interesting working model this, of a fair attraction. It is of reasonably simple construction, with nothing difficult to encounter, and should prove a novel piece of work. It follows out fairly closely the original prototype, with what might be the tricky parts omitted. Carefully made, the little chairs will swing out in circle, just like the real thing, when the handle is turned.

Framework

Some of the parts are grouped together in Fig. 1, forming what we might call the framework of the whole. From ¼in. wood cut two of parts (A). Run a pencil line along the middle, and on this, at the points indicated, bore holes ¼in. diameter through both.

It would be as well to temporarily nail both together, and bore the holes through both at one operation. In the top piece, at the left, saw out ¼in. by ½in. mortise slots, each side of the hole.

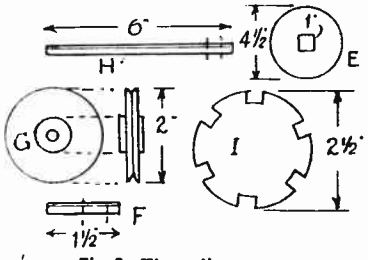


Fig. 2—The pulley parts

Then enlarge the hole between with a round file so that the shaft, referred to later on, will not rub against it when rotating.

Join these two parts together with ½in. wide strips of wood at the ends, as shown in the side view (B). In the space between, the pulleys for the shaft and operating handle, rotate. Screw these together for ease in removing the top piece for subsequent fitting of the moving parts referred to.

A base piece, which can be cut from deal about ½in. thick is now cut. This measures 10ins. long and 3ins. wide, and is screwed below. The projecting edges of this are bevelled or rounded off. Cut from the ¼in. wood, two of parts (C) and (D). In the latter cut some ½in. long tenons at the bottom ends to fit the mortise slots in the top piece. Glue and nail these parts together to make a square hollow pillar, 1in. each way, and fit in the top piece.

Cut a 1in. square piece of the wood,

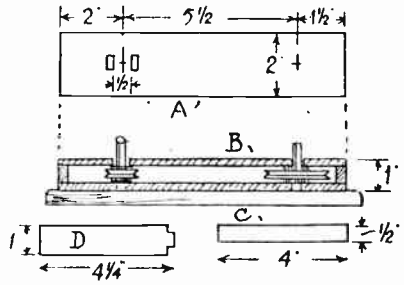


Fig. 1 Section and plan of base

and in its exact centre bore a ¼in. hole. Glue and nail this to the top of the pillar, and, to ensure easy rotation of the shaft, see that the holes in top of pillar and bottom piece of the framework are truly in line. Test this with a piece of ¼in. round rod.

From ¼in. wood cut the part (E), shown in Fig. 2. Push this over the pillar, removing the top part (A) first, and screw it from below (A), fixing it firmly to the latter part. From ¼in. round wood rod, cut the spindle of the handle (F) and the shaft (H). Also from ¼in. wood cut the round disc (G), and file a groove round its edge rather deeply.

Bore this ¼in. in the centre and each side of the disc glue ¾in. discs of ¼in. fretwood, boring these also for the spindle. This pulley, as we can term it, is glued to the spindle, ¼in. full, from the bottom. As the pulley is to rotate in the space between top and bottom of the framework, it would be as well to glasspaper the outer sides of the small discs of it to lessen the total thickness a trifle, the pulley will then turn easier.

The Pulley

A similar pulley is made for the shaft, but smaller in diameter, 1in. in fact, with ⅝in. discs each side. This is glued a full ¼in. from the bottom of the shaft also. Before fitting these parts in their respective positions, a little lubricant should be applied to the bearing holes to ensure easy motion. A spot of lard, with a pinch of powdered black lead will be about the best lubricant to use.

Make it a stiff paste, and work it well in the bearing holes in the framework, and at the top of the pillar. Now place both shaft and spindle in their holes, replace the top part, and screw down. It will be seen that fresh screw holes must be made to fix the top down again to replace those covered by the circular part (E).

Winding Cord

For a band, to connect the pulleys, very thin whipcord or common grocer's twine will do nicely. Pass this round the small pulley, cross the ends and pass those round the large pulley, and there knot tightly. Complete the handle by gluing to the top of the spindle a 2in. diameter disc of the ¼in. fretwood, with a small piece of the rod glued in it to grip with, as seen in the general view. Let the glue harden, then on rotating the handle, the shaft should turn easily. It will improve when 'worked in' and the lubricant has not been skimped.

Cut part (I) from ¼in. wood, and divide the edge into six equal parts. At these spots saw out the slots shown, ⅜in. wide and ¼in. deep. File a groove in the

(Continued foot of page 344)

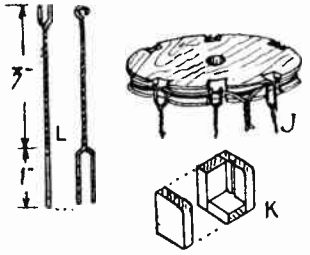
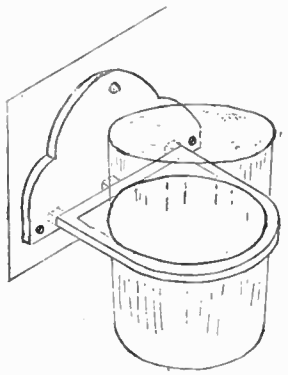


Fig. 3—Pillar parts

A practical article for the bathroom is this

PLASTIC BEAKER RACK



THIS is another useful but light, cheap and handy plastic model, which can be made from a rectangular piece of Perspex 6ins. long, 4ins. wide, and 4mm. thick.

Its construction requires accurate fretsaw work, neat filing, and plenty of patience.

Your first task is to cover the Perspex sheet with a thin but good quality coloured gummed-on-one-side paper. When this is dry, trim the overlap to the perimeter of the plastic.

Fretsaw Cutting

Now draw the central line lengthways on the gummed paper, and set out the front view and the plan of the beaker holder, exactly as is shown in the diagram. Use the steel point of your compass very lightly, and do your drawing work accurately. When this is completed use your fretsaw to remove the outer shaded portion of the plan of the beaker holder. Keep to the outside of the cutting line so as to allow for smoothing and finishing.

To remove the circular shaded area, take your hand-drill fitted with a No. 17 drill, and make a hole near to the circumference inside the circular area of the Perspex. Release one end of the fretsaw blade and thread it through the hole. Then re-adjust the fretsaw, and cut out the circular piece on a V-block fixed in your vice.

Now fretsaw along the curves of the back and then across the dotted line to separate the two pieces of the model. Finish the front by cutting out the three $\frac{3}{16}$in. pins. Again keep to the outside of the contour lines of the pins. Remember that it is better for the pin to be a little too wide than too narrow.

Cleaning

With No. 1 and No. OO glasspaper smooth down all edges and curves of the front piece except those of the three pins. To make the slots in the back for these pins drill holes with a No. 14 drill, and then file each of these to shape with a 3in. needle file.

By frequent testing you will eventually find a tight fit for each of the pins. Now drill out the wood screw holes with a No. 30 drill, and counter sink these to receive size 4 chromium plated wood screws to fasten the model to the woodwork.

Assembly

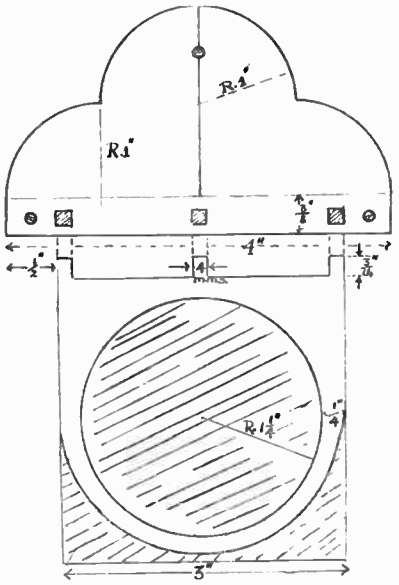
When both parts are entirely finished, make a final trial fitting. Then to fuse the parts together, dip a No. 3 paint brush into some concentrated (glacial) acetic acid and smear a layer of this on the sides of the pins, and along the shoulders between them. Poke the slots with the brush, too.

Fit the parts together again, and leave for 24 hours. If your work is good and the fit is tight, there will be no need for any external pressure. When you resume the work fix the bracket in a smooth-jawed vice, and cross file away the slight protrusions of the pins behind the back with a 10in. smooth parallel flat file. Clean up the joints and the surface of the Perspex with your glasspaper.

Polished Finish

To give your work the expert's finish, remove all scratches with the glasspaper, and rub down with a piece of old stocking moistened with Silvo. Then wipe away the dried Silvo, and rub vigorously with some clean silk.

Now your model is ready for fixing to the woodwork of the room where you want to use it. (359)



Chairoplane—(*Continued from page 343*)

edge, exactly as done for the pulley, but not quite so deep, and bore it to fit the shaft.

Some half dozen hangers must now be made, to which the chairs will be fitted. These are shown at (L), and are made from wire, not too stout a gauge. Cut twelve pieces about 6ins. long, and treat each two of them as a pair to make one hanger. Proceed in this manner.

Ring Parts

At the tops of each pair, twist the wires to form tiny rings. Then, about $\frac{1}{4}$in. below these, twist the wires together for a length of 3ins. Open out to $\frac{1}{4}$in. apart and straighten the remainder parallel. Cut all the hangers to a length of 4ins., and try to get the whole six alike.

The chairs (K) are made from $\frac{1}{4}$in. fretwood, for the centre parts, with side pieces of $\frac{1}{8}$in. wood. They should be about $\frac{5}{8}$in. square. In the side pieces, before they are glued in place, make a shallow saw kerf, where shown, in which the wire ends of the hangers can pass. When the glued up chairs are set, push the wire ends through these saw kerfs, and bend over about $\frac{1}{8}$in. of each inwards to keep them from working out.

Assembly

These are now fitted to part (I) to swing quite freely. Get a few inches of thin iron wire, and thread it through the eye holes in the tops of the hangers. Pass the wire round the groove in (I), see each hanger is in its respective slot, then twist the ends of the wire until it sinks into the groove.

This will be better explained by looking at detail sketch (J). Now glue (I) to the shaft, letting it clear the top of the pillar by about $\frac{1}{8}$in. All being well, as the shaft rotates, the chairs will swing round and out merrily.

Painting

Finish the toy with a stout pin, driven into the top of the shaft, and furnished with a tiny flag. Paint the whole attractively, any bright colours will do, the brighter the better. One 7ins. by 14ins. panel of fretwood will provide the material for all parts of that thickness, with a 3ins. by 10ins. piece of deal for the base. One 4ins. by 9ins. panel of $\frac{1}{8}$in. wood is needed, unless the reader already possesses a few scraps of that thickness, as little is necessary, about 9ins. of $\frac{1}{4}$in. round wood rod for the shaft, etc. (368)

How to convert a 'grandfather' case into a HALL CLOCK CUPBOARD

A GRANDFATHER clock in the hall, undoubtedly, gives an air of distinction to a house, but it is not always possible to fit such an article of furniture in some of the smaller halls. This is where the more modern grandmother and the even smaller granddaughter clocks are extremely useful.

The subjects of this article is just such a granddaughter clock of quite modern design. It is planned to house in the top portion any clock you may have available and, if possible, one without a pendulum. Instead of the usual pendulum and weights, the base of the clock case is divided off to accommodate umbrellas, and with a small compartment for gloves or any other odds and ends.

General Appearance

The old grandfather clock cases were mostly made of either oak, walnut or mahogany, but you must make your own choice regarding the kind of wood to use. It may depend on the present hall furnishings, or you may have a small stock of wood you wish to use up. You can, in fact, use practically any type of well seasoned wood and make a really satisfactory job.

You may have to vary some of the measurements slightly, as for instance, if you use plywood, some form of backing and extra strengthening bars may be needed.

The main framework of the case is made up of two sides 4ft. 9ins. long, 6ins. wide and ½in. thick: the front is the same length and thickness and 10½ins. wide, and the back can be of plywood. The back is strengthened by bars of wood 3ins. wide and ½in. thick across the top, bottom and centre.

Refit the Door

Provided the door in the front is marked and cut out carefully, the actual piece of wood taken out can be used for the purpose. The writer used a fretsaw on the corners and a fine keyhole saw for the remainder of the work which left just a nice gap, and when finished off with a narrow beading glued round, made a perfect fitting door.

This part can all be done and a neat pair of ornamental hinges fitted before the case is put together. The front is then ready to be glued and pinned to the sides: the back must wait until some of the interior fittings have been made.

Shelf

First of these then had better be the shelf for the clock to stand on, and its position will depend upon the type and size of the clock. It will be seen from the drawing that the top portion, or hood of the clock as it is called, is 12ins. deep, therefore the centre of the clock hands must be 6ins. from the top. From this the position of the shelf can easily be calculated.

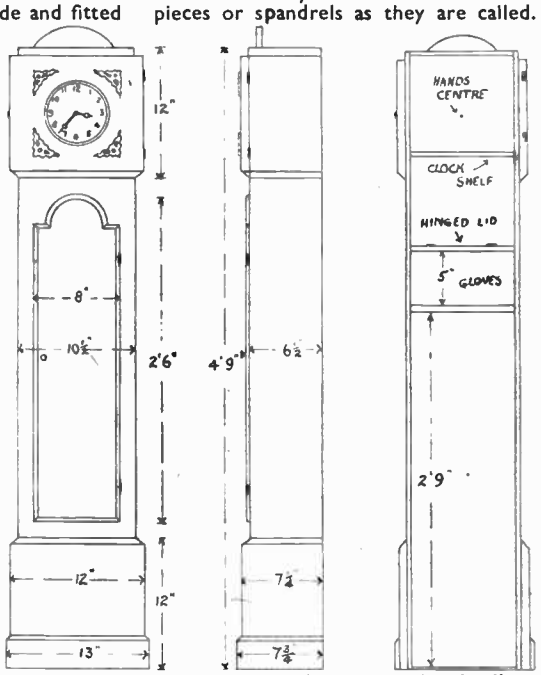
The clock can just stand on the shelf or it can be secured in a framework of some sort. It depends upon the type of clock used and whether it is wound up from the front or the back, and this little problem must be left for you to decide. A piece of ½in. thick wood will be about right for the shelf.

A hole is cut in the hood portion of the case at the front about 8ins. square, which will allow ample space for the removal of the clock for winding if it is necessary.

The base can now be made and fitted on to the framework. For this ¾in. thick boards are used, but ½in. ones will do nearly as well, the only difference being a more steady and better balanced case when the thicker boards are used.

The height of the base is 12ins. made up of two or more boards glued and pinned on. Using ¾in. boards the front will be 12ins. wide and the sides 7¼ins., the corners being mitred to produce a better finish.

The top edges can be plain bevelled or an ornamental moulding can be worked on. A strip of 3ins. wide and ½in. thick wood is cut into a 13in. length and two 7¾in. lengths and fastened right at the bottom, the corners are again mitred and the top edges moulded as before. A few panel pins are used to give added strength when fixing all these boards in position.



Front and side view with interior construction detail

Top

We can now build up the hood or top portion of the case. As the front is in the form of a door, the hood is made slightly different from the base, the corners not being mitred.

For the sides two pieces of wood are cut 11½ins. long, 6½ins. wide and ½in. or ¾in. thick, the former thickness, probably, being best for the job, as it would not be top heavy. Bevel off the bottom edges or else work a moulding similar in pattern to the base.

The door could very well be made of plywood fixed on to a light framework to make up the necessary thickness of ½in. or ¾in., whichever is decided on. The width of the door when using ¾in. wood is 12ins., but for ½in. thick wood, this will be 11½ins., the depth in either case being 11ins.

A bevel or moulding is not worked on the bottom of the door, but is a separate piece of wood glued and pinned to the case. The door will then have something to rest upon when closed.

The Dial

Before fixing the door in position with a small pair of hinges, a circular hole is cut in the centre to fit the clock dial. It can be left quite plain or ornamented to suit your fancy, such as a bevel either on the outside or inside, or a thin circular overlay can be fastened about ½in. from the hole.

The outside of the door can also be ornamented by four fretted corner pieces or spandrels as they are called. Many of the brass dials of the old grandfather clocks are ornamented in this manner and some are very fine examples of the patience of the old craftsmen.

A piece of ½in. wood is fastened on to the top of the case and finished off with a semicircular piece 7ins. long and 2ins. wide, glued and pinned on, as shown.

Although it is not necessary to fit a bottom in the case, it would certainly be an improvement, and need not consist of more than a piece of plywood well fitted.

The internal fittings to the clock case are quite simple and do not require much explaining. They can, of course, be altered and improved to suit your own requirements.

The bottom portion is reserved for umbrellas and 33ins. has been allowed for them. A piece of ½in. wood is, therefore, placed at this height from the

(*Continued foot of page 346*)

Experiments with salicylic acid and sodium salicylate in HOME CHEMISTRY

MOST home experimenters have at some time tested for ferric salts with sodium salicylate and been rewarded with a splendid purple colouration.

Though this is our main use for sodium salicylate, there are many other interesting experiments we can do with it and with salicylic acid itself. 1oz. of each may be bought for a few pence from any chemist, if you have not already got them.

Let us start with salicylic acid. This acid occurs in nature in the meadow-sweet plant and in oil of wintergreen. It is used as a preservative and as an antiseptic, and for manufacturing our old headache stand-by, aspirin.

Shake a little of the acid with cold water in a test tube. It does not dissolve. Now heat it. As the water nears the boiling point the acid dissolves. On cooling, it crystallises out in long white needles.

Carbolic

Salicylic acid gives us one method of making that useful disinfectant carbolic acid, or as it is known to chemists, phenol. When salicylic acid is heated with lime (calcium oxide), the lime removes carbon dioxide from the acid and becomes chalk (calcium carbonate) and converts the acid into phenol.

Try this by mixing intimately equal bulks of salicylic acid and lime and heating in a dry hard glass test tube. Slope the test tube down with the open end over an evaporating dish. Now heat the tube. Immediately the sweet smell of carbolic acid will be noticed and drops of it will condense near the open end of the tube and fall into the basin.

You can prove this is phenol by taking up a drop on a glass rod (do not touch it with the fingers, as it raises blisters) and dissolve it in water in a test tube. Add ammonia and a filtered solution of bleaching powder and warm it, when a blue colour will appear.

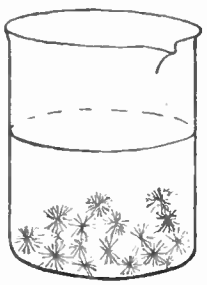
The residue in the tube will effervesce with a dilute acid, and if a glass rod dipped in lime water be held in the mouth of the tube it will become milky from carbon dioxide. This shows that the lime has become calcium carbonate.

If we boil salicylic acid with dilute nitric acid a curious new acid is formed called nitrosalicylic acid. To prepare it take some salicylic acid and boil it with dilute (strength about 10 per cent) nitric acid. The solution darkens to deep red-brown. Add a little more nitric acid and reboil it.

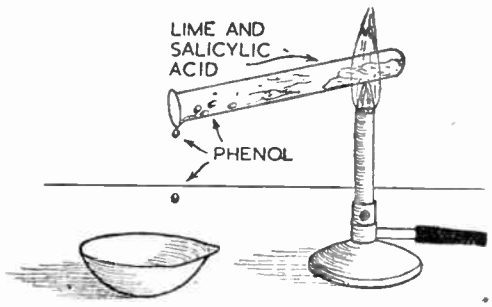
If the solution does not darken further, the reaction is complete. On cooling the acid separates out as a buff powder. Filter it off and dissolve it in a small quantity of boiling water. As the solution cools the acid separates out as small white felted needles.

Experiments

And now let us do some experiments with sodium salicylate. Its appearance differs from salicylic acid, for its crystals look like pearly white scales. It is also unlike the acid in its solubility, for it is very soluble in cold water.



Crystals of bismuth salicylate



How to make carbolic acid

We can use this difference to prepare the acid. Make a solution of sodium salicylate and add to it dilute hydrochloric or sulphuric acid. A white precipitate of salicylic acid is immediately formed. Filter this off and dissolve it in boiling water. The familiar needles of the acid will crystallise out on cooling.

Salicylic acid, of course, forms salts not only with sodium, but with other metals. Most of them are soluble in water. Some have beautiful crystalline forms; for example, bismuth salicylate.

This is easily prepared by mixing cold solutions of bismuth nitrate and sodium salicylate. It is precipitated as a white powder. Filter this off and put it in a small beaker. Add a little water and boil it. The salt dissolves and as the solution cools, pretty spherical groups of colourless needles separate out.

Lead salicylate may be prepared in the same way, using lead acetate instead of bismuth nitrate. Lead salicylate crystallises from hot water in star-like groups of small colourless prisms.

Copper salicylate, though soluble in cold water, may be precipitated by using strong solutions. Add powdered copper sulphate to boiling water in a wide test tube until no more dissolves. As it cools the excess copper sulphate crystallises out. Pour the strong solution off the crystals and add to it a strong solution of sodium salicylate made by dissolving the salt in an equal bulk of cold water.

A lovely grass-green precipitate forms. Filter this off and add to it just enough hot but not boiling water to dissolve it. A deep green solution is formed. From it copper salicylate crystallises out on cooling in tufts of light blue needles.

And now let us end these experiments with a nice smell. Put a little solid sodium salicylate in a test tube, cover it with methyl alcohol and add a few drops of strong sulphuric acid. On warming it you will notice the fragrant odour of oil of wintergreen (methyl salicylate), which is so useful as an embrocation. (283)

Clock Cupboard—*(Continued from page 345)*

bottom and is in reality the bottom of a small compartment designed for gloves and other small articles. The front of this compartment is a strip of thin wood or even plywood about 5ins. in height and on top of this another piece of thin wood to form a lid. This can be hinged direct on to the back, or, if preferred, on to a 1in. wide strip of wood fastened on to the back.

A few brass cup hooks screwed under the base of the glove compartment are useful for clothes brushes, keys or dog lead, and put a finish to the interior fittings.

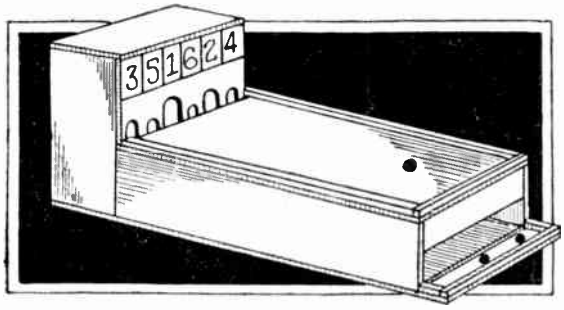
The case can now be glasspapered smooth, nail holes, if any, filled with a wood filler, and then polished. The ideal finish for any worth-while piece of furniture is, undoubtedly, by wax polishing, but when properly done, this requires patience and generally takes rather a long time.

To get the best results the polish should be well rubbed in and then left until next day, when the surface should be well rubbed with a clean cloth. Then apply some more polish and repeat the process until the required finish is obtained. Some woods may require some weeks spent on them, but the final result is well worth the time spent on doing it.

A much quicker method is to go over the case with a good french polish (366).

An ingenious and attractive game—

ELECTRIC MARBLE BOARD



THE Marble Board shown here has several modern features that make it an interesting piece of work to make up and a fascinating game to play. When a marble is successfully holed it automatically lights up the relative score for that hole, the marble then being returned to the front of the board ready for re-playing. The simple lighting system is provided by a torch battery and flashbulbs, all housed inside the case.

It will be readily appreciated that the measurements given can be easily varied as required to suit whatever material is available. The dimensions shown in the cutting list provide a board that is large enough to make the game interesting but not too intricate for the home handyman to tackle with confidence.

Wood of ¼in. thickness is allowed for throughout, though, if necessary, some of the pieces might equally well be cut from stout cardboard reinforced at the corners, to save wood in these times.

Materials Required

Very little other than the wood shown is required, and that only the odd bits and pieces that the handyman collects out of habit and which always 'come in useful sometime'. A piece of 2 round iron rod (or steel knitting needle); some thin metal strip from which to cut six pieces each 3½ins. by ½in.—thin brass, tin or sheet lead will do; six low-consumption flashbulbs and a single cell torch battery; a strip of Perspex or similar transparent material to cover over the cut-out score figures; a few oddments of dowel; and, of course, a supply of marbles!

The Case

Make a start with the case itself. It will be seen (Fig. 1) that the base extends the full length of 20ins. The long parts of the sides are 15¼ins. long and the upright side pieces 2¾ins. wide and 6ins. high. This leaves a gap at the serving end of the board, where the marbles are delivered. They are prevented from rolling off by three thin strips glued round the bottom edge as shown, and similar strips are glued round the piece forming the rolling board, for the same reason.

The end piece at the serving end is 7½ins. long and only 1½ins. wide, to leave the necessary gap for the marbles to roll off the delivery. The other end of the case is in two parts, the bottom piece 1½ins. and the top piece 3¾ins. wide. This leaves a space of ¾in. between, through which the electrical contact makers project slightly, in the manner explained below.

The lid, measuring 8ins. by 3ins., is hinged on as shown, and the scoring board (which rests on the rolling board) measures 8ins. by 3ins. also. This scoring board is fretted out, as shown at Fig. 2, with six holes of various sizes and corresponding figures above the holes. The scores shown are just one suggestion; but take care to see that the lowest scores are placed over the biggest holes, and that the highest are situated between the lower ones.

Make sure, too, that the marbles to be used do really pass through the smallest hole—otherwise one's friends may come to take a poor view of one's sportsmanship!

The Internal Woodwork

A general view of 'the works' is shown at Fig. 3. When the marbles pass through a hole they roll down a slanting board to the contact makers, as seen at Fig. 4. This board measures 7½ins. long and 1¾ins. wide. It has to be fixed to the rolling board at an angle, so needs one edge tapering for this; and to give plenty of clearance for the marbles to get away. the bottom edge is also tapered, as shown.

To hold this slanting board in position two little arc-shaped pieces are cut and glued to the sides of the case. But it is best to leave these until later when the exact size required can be easily gauged. Divide the board into six equal sections. then glue across it some small strips, in pairs tapering together, to guide the marbles down to the contact makers, as shown at Fig. 4.

After the marbles have pushed forward the contact makers they fall on to another slanting board which delivers them to the playing end of the case. So cut this board next, measuring 17½ins. long and 7½ins. wide.

A lamp board is required, 7½ins. long and 2¾ins. wide, and a strip 7½ins. by 1¼ins. to form the base of the lamp houses. The spaces for the lamp holders are then divided off with five little pieces each 1¼ins. square.

The Lighting

Now we come to the lighting arrange-

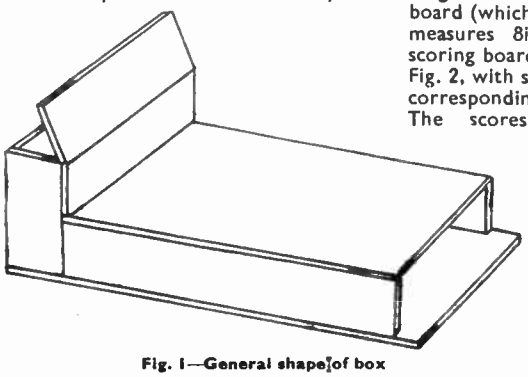


Fig. 1—General shape of box

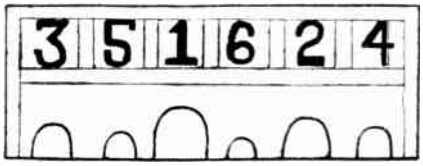


Fig. 2—The entrance arches and numbers

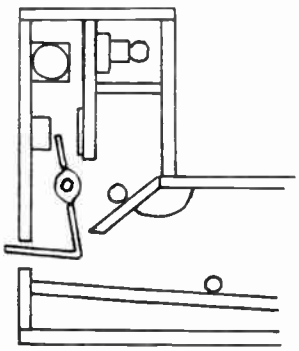


Fig. 3—Section of top end

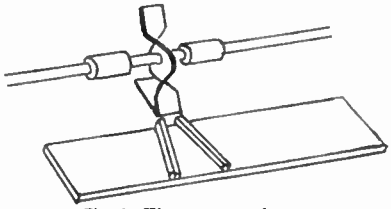


Fig. 4—The contact pieces

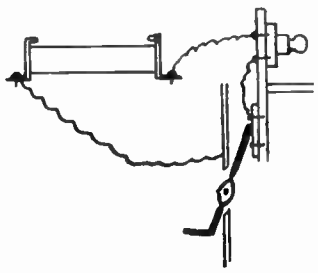


Fig. 5—Electrical contacts

ments. Six bulb holders are screwed in their places along the top of the lamp board (not forgetting the two holes behind each for the wires to come through). At the bottom of the board and on the other side of it, six metal plates (tin will do well) each about 1in. square are screwed, one immediately under each lamp, as shown at Fig. 5.

The contact makers swing loosely on a metal spindle 8ins. long and about ¼in. diameter.

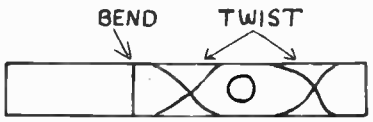


Fig. 6—Shape of ball piece

A piece of iron rod, or steel knitting needle, serves for this. Flatten it a little at each end, so that when later it is driven into the holes drilled for it in the sides of the case, it will not move round. For the contact makers themselves cut six pieces of the thin metal strip each 3½ins. by ½in. Bore a hole in each 1½ins. from one end, of just sufficient diameter to fit the spindle nicely and sharpen up the edges of the holes if necessary, so that the strips swing easily on the spindle. Now we have to bend them to the required shape.

For the efficient working of the toy it is essential that these pieces shall fall forward smoothly when pushed by the falling marble, and project out of the back of the case so that they can be pushed back to their original position afterwards. So it is worth while to experiment first with one, then make the others when just the correct position has been found. Fig. 6 shows their general shape.

About 1⅛ins. from the end that is furthest from the hole, they are bent to a rightangle. Between here and the hole they are twisted to a rightangle that way and at the other end given another twist similarly. If the metal is at all thick or stiff, the twisting is made neater by cutting the strips narrower at these points.

The holes for the spindle that are made in the sides are 2¾ins. from the bottom and ⅜ths from the back end. Put the spindle in temporarily, with one of the contact makers on it, for a trial. Normally the top end of the contact maker leans backwards a little and the bottom forward, to meet the marble. When a marble strikes the bottom part it pushes that back and the top end comes forward and touches the contact plate, which closes the lighting circuit on that number.

By means of the arc-shaped supports, arrange the slanting board to deliver the marble just at the right place; and glue a thin strip along the top inside edge of the case as a stop to prevent the contact makers from tilting back too far.

Assembling the Contact Makers

Having arrived at the position and exact shape for the contact makers, make the other five identical with the first. To position them on the spindle and prevent them from moving, five collars each 1⅛ins. long and (for the ends) two of ½in. are required. These can be cut from small metal tubing if available, or easily made from a piece of ½in. dowel. If the latter is used, cut off the lengths first, then bore down each with a hole of the necessary diameter, to allow them to slide loosely on to the spindle.

Thread the collars and contact makers alternately on to the spindle, making sure that all the space is taken up but that the contact makers are not too tight to move easily, then fix the spindle into the sides of the case permanently. Handymen who are good at tapping threads will make the spindle long enough to have a screw nut on either side of the case; but this is by no means essential, provided the spindle is held fairly tightly in its position.

Wiring Up

First make a simple holder for the single-cell battery, from two pieces of metal strip, as shown at Fig. 5, and screw them to the inside back of the case behind the lamp board. Do not forget to remove the cardboard lip at the bottom of the battery, so that contact is made with the holder at both ends.

CUTTING LIST
(for wood of ¼" thickness)

No. of pieces	Description	Size
1	Base	20" × 8"
2	Sides	15½" × 2¾"
2	Sides	6" × 2¾"
1	Rolling Board	15½" × 8"
1	Front End	7½" × 1½"
1	Back End, top	7½" × 3¾"
1	Back End, bottom	7½" × 1½"
1	Scoring Board	8" × 3"
1	Lid	8" × 3"
1	Slanting Board	7½" × 1¾"
1	Marble Delivery Board	17½" × 7½"
1	Lamp Board	7½" × 2¾"
1	Lamp Compartment Base	7½" × 1½"
5	Lamp Compartment Sections	1½" × 1½"

Connect one terminal of each lamp holder to a master wire running along the back of the lamp board and join this to one end of the battery holder. The other terminal of each lamp holder is wired to its corresponding metal plate below, and the other end of the battery holder is connected to the spindle.

To finish, hinge on the lid, cover over the cut-out figures with some transparent material, and go over the case with stain, varnish, or bright enamels as preferred. (380)

QUEER HOBBIES OF THE WORLD

IN the little town of Brightlingsea, Essex, lives Mr. W. Sutherwood, a local newsagent with a strange and novel hobby. In his leisure-time from selling newspapers and periodicals from his newsagent's hut on the beach at St. Osyth Stone, Mr. Sutherwood looked around for an unusual hobby which would occupy his time. So he started to collect matches—not with the idea of making one or other of the usual conventional bus or house or ship models from them—but to make himself a walking-stick. It took him a very long time, but by carefully interlocking the spent matches, gluing them together one by one, he was eventually able to build up a hard core of solid wood, strong enough to form the straight part of his stick. Then came the curved handle, which gave him much trouble, as the matches had to be broken with great care so that their outer surfaces when fixed into position formed a smooth curve. Much patience was needed to glue them together in this fashion, but at last the required shape and strength were achieved. Mr. Sutherwood's match-stick cane is just about the normal weight for an ordinary walking-stick, which is surprising, and is of the conventional size and design. It has been skilfully varnished to give a hard gloss finish, and is usable just like a straightforward stick. (280)

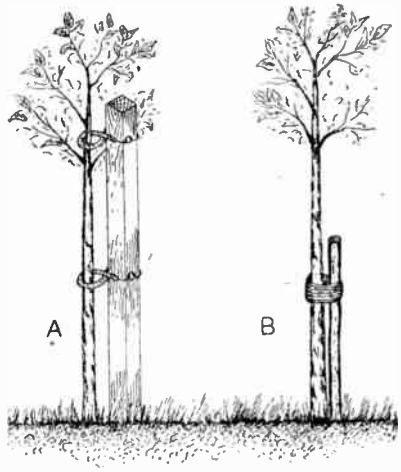
DR. CLAUDE BAKER GABB, of Tunbridge Wells, Kent, who died not long ago, had one of the strangest hobbies ever invented. Every weekday for some 30 years he looked through the 'Deaths' column in the press of this country and of any other country he could get hold of. His purpose was to note down the names, ages and occupations of all those who were 90 or over when they died. Then, once a year, he drew up a detailed summary of his unique findings. He discovered, for instance, that 1938 was the best year for longevity, for 531 nonagenarians died then. The lowest number was in 1918, when his figure was only 238. Over the whole of the time he pursued this hobby, he had records of over 13,000 people who reached the age of at least 90. He also gleaned other pieces of information. He revealed, for instance, that more women lived to a great age than men—the rate being nearly three women to one man—and that old age is commonest among clergymen and their widows, and in Canada and Ireland. As fate would have it, Dr. Gabb was able to follow his unique hobby right up to his own death at the age of almost 91. So he just qualified for his own list! (280)

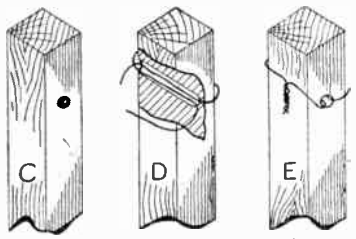
Make secure against weather with proper

FENCE AND TREE SUPPORTS

IT is a good plan to take a little care when supporting young trees in the garden if trouble and bad tempers are to be avoided. Take a look round at some gardens and it is surprising the number of small trees without support of any kind, many slanting over at a good angle as a result of high winds and gales.

Again it is difficult to know sometimes if the young tree is giving support





to the supplied stake, as for example indicated in view (B) in the accompanying illustrations. Clearly the stake is much too small for the size of tree indicated, and after a moderate gale or two, both tree and stake will be seen in anything but an upright position.

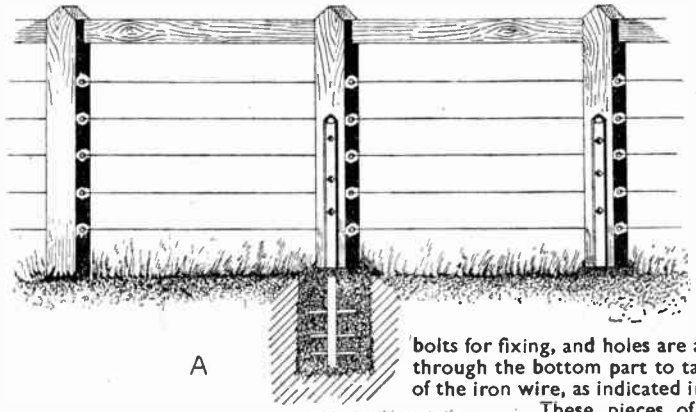
If the young tree is worth a support at all the job should be done in a little more thorough manner.

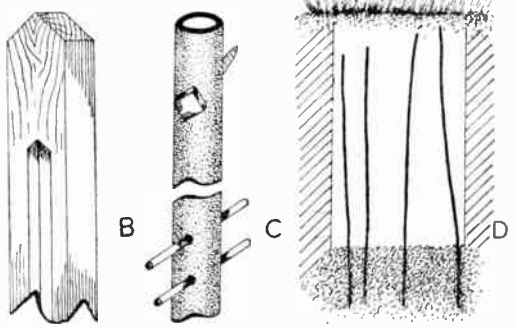
The writer finds the following method quite good and stands up to high winds and gales very well. The method of support is indicated at view (A), and shows the stake of ample size which is necessary to support the tree.

In place of the common method of binding the tree to the post with string, a much better way well worth trying is as follows. First have the stakes large enough, and make holes, as shown in view (C), one being near the top and the other half way down, as seen in view (A) A length of fairly strong galvanized wire is needed, also some pieces of strong rubber tubing.

The piece of wire is inserted in the hole, as seen in the section view (D), and the piece of rubber tube is wound round in contact with the tree, as shown in view (A). The ends of the wire at the back of the stake are twisted up with pliers, as shown in view (E). Provided, of course, the stake is driven well into the soil, young trees supported in this manner will stand up to rough weather very well. (377)

THE wooden posts of light fences are subjected to rotting away at ground level in just the same way as posts used for supporting heavy fences. Whereas repair work for heavy fences entails a more heavy form of support in the way of concrete posts well cleated and cemented in the ground, a light fence can be dealt with in a little more simple manner.





In the accompanying illustrations, view (A) indicates a form of light fence with the left hand post shown rotting at ground level, and the middle and right hand posts have been treated and supported in a manner described as follows.

The actual supports are in the form of galvanized iron tubing, odd lengths of which can often be obtained from builders or ironmongers.

The tubing should not be less than 1in. diameter, and of such length as to allow for about 2ft. in the ground and to reach about half way up the posts above ground level. A number of coach screws of the required length to pass through the tube supports well into the wooden posts are required, also some lengths of iron wire about ⅛in. diameter and, of course, some cement and small gravel and a little sand for making a concrete mixture.

The rotten portion of the post is best cut away, and then chisel a groove down the post to make a seating for the tube, as indicated in view (B). Holes are drilled through the tube to take the bolts for fixing, and holes are also drilled through the bottom part to take lengths of the iron wire, as indicated in view (C). These pieces of wire bind the tube and concrete, and ensure a good sound joint, as is shown in the middle post view.(A).

The hole to take the tube should be about 1½ft. to 2ft. deep and about 1ft. square and a few lengths of the iron wire are driven in position, as indicated in view (D).

The tube is now bolted in position and the post drawn upright, after which the hole is filled in with a mixture of concrete. Puddle the concrete well into the hole with a stout stick to make quite sure of it binding to the tube and wire.

(378)

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