Hobbies WEEKLY

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Instructions for making

A MODEL INN SIGN TABLE LAMP

FOR a bedroom or a private 'den' it is rather nice to have something out of the ordinary in the way of table lamps. The electric table lamp standards in the shops today are many and various, but they all have one thing in common. They are expensive. It is well worth while making one yourself if you have a little spare time at your disposal.

Inexpensive

Here is a suggestion for an entirely original and inexpensive table lamp which, as you can see from Fig. 1, takes the form of a miniature inn sign. It is very simple to make. The only tools you will need will be a chisel, a small saw, a drill and a screwdriver. Of course, if you have a complete carpenter's tool kit, so much the better. Some carpenter's glue, a few 1½in. and 2in. screws and some glasspaper of assorted grades will complete your requirements.

Cut out the piece for the pillar first from a length of 1¼in. square wood. The pillar should be 10ins. long exactly. The long corners may be bevelled if you choose, but if you do, strip no more than ¼in. off with your chisel. The end corners should not be bevelled. When this has been done, smooth the pillar down with glasspaper.

In making a standard of this type, a difficulty frequently experienced is that of boring the hole for the flex through the middle of the pillar. However, this can be overcome quite easily. If you cannot obtain a drill long enough, or if you feel rather doubtful about your ability to bore a hole of this length, try this method. Saw the pillar lengthwise into two parts, gouge out a ¼in. groove down the length of one half and then glue the two pieces together again.

The base should measure 6ins. by 4ins., and should be cut from wood ¾in. thick. Here again, bevel the upper edges and smooth off the surfaces with glasspaper. Mark out on the upper surface of the block where the pillar will eventually stand. This should be ½in. from one side. With a chisel cut out a square the width of the pillar and ¼in. deep into which the pillar can be fitted. Now bore a hole through the base for the flex, making sure that it coincides exactly with the hole in the pillar. Run a ¼in. groove along the underside of the base from the hole to the nearest side along which to run the flex away to the wall plug (Fig. 2).

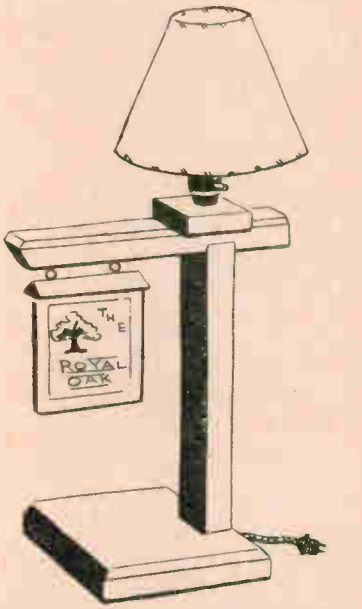


Fig. 1—How the lamp looks when completed

Now fit the pillar into the base and screw it securely in place, using two of the 1½in. screws. Sink the heads of the screws well into the underneath of the base so that the balance of the lamp standard will not be upset. A little glue will help to hold the pillar and base together, and will serve to fill in the cracks where the two pieces join.

The Cross-piece

Cut the cross-piece to measure 9ins. in length by 1½ins. square. 2ins. from one end you must prepare a groove in which to countersink the head of the

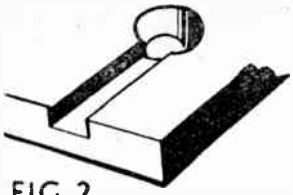


FIG. 2

pillar. This joint should be ½in. deep and, of course, 1½ins. wide. Do not forget to bore another hole for the flex exactly coincident with the hole in the pillar, as shown in Fig. 3. Glue and screw down the cross-piece so that the longer overlap coincides with the longer part of the base.

The bulb socket, which you will have to purchase at your local electric dealer, stands in another wooden block. Cut this out next to measure 2½ins. square from wood ½in. thick. Bevel the edges and smooth with glasspaper again. Bore a hole dead centre large enough for the bulb socket to fit into tightly. When this is done, screw the lamp block down on to the cross-piece immediately over the pillar.

Threading the Flex

Now thread the flex up through the lamp standard. Attach the two wires to the terminals of the bakelite bulb socket and, pulling the flex back down into the standard, sink the socket tightly into the lamp block. Glue it in for additional security.

The inn sign itself is extremely simple. Cut it out from a piece of good quality three-ply to measure 4½ins. long and 4ins. wide. Smooth it down and

FIG.3

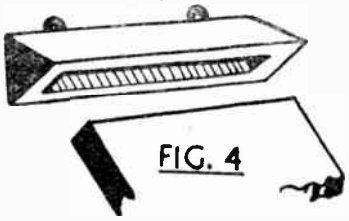


FIG. 4

glue over the top a small wooden gabled 'roof'. It is advisable to countersink the actual signboard into this triangular strip of wood, as shown in Fig. 4. Now sink two small hooks into the underside of the cross-piece, and two 'eyes' into the gable of the inn sign. The little hooks and 'eyes' used for curtain springs are ideal for this job. Hook the board up and ensure that it swings freely.

If you are artistically minded you can paint the signboard yourself with the conventional 'Red Lion' or some other such design. If not, suitable coloured pictures frequently appear in magazines. They can be cut out and glued on to the board. The lettering you will have to do yourself, using a very fine brush.

When your lamp standard is plugged into the wall plug and a bulb has been installed, there remains only a shade to complete the finished article. This shade should not be too large or it will completely hide the inn sign. One about 6ins. in diameter and of the same height is the most suitable.

You can buy such a shade quite cheaply or, again, you can make one yourself. First make a wire frame and then cover it with good quality cartridge paper or thick wax-impregnated paper. Bind this cover on to the frame with raffia or some coloured wool. Attach the shade to the bulb socket by means of wire struts, and the inn sign table lamp standard is now made.

Just a few final tips with regard to the making of this novel lamp standard. First, never use glasspaper in your fingers. Wrap your sheet round a block of wood cut to a size that can be held in the hand with comfort. This will ensure an equal pressure on all parts of the wood surface that is being finished. Secondly, it is a good idea to glue a piece of baize under the base of the standard to prevent it from scratching the furniture. And it will also confine the flex lead within the groove you have cut for it in the base block.

If you are an artist, or if you have a friend with talents in that direction, why not decorate the shade of the lamp? A black-and-white sketch of a picturesque old half-timbered country inn would be very much in keeping with this novel inn sign lamp.

Lastly, do not take too much elaborate care with the finish of your lamp standard. Do not highly polish it, as it will look best if the finish is deliberately rustic. A small tin of light oak stain will suffice to give it a final air of rustic charm. (116)

A Simple Burglar Alarm

WE are not suggesting that the treasures in your 'den' are likely to attract the attentions of burglars but a great deal of fun can be had from fitting a simple warning device such as described below.

Fig. 1

Fig. 2

Cut a 3in. length of ½in. wide copper strip and turn up ½in. at each end, as in Fig. 1. Then cut another length 2½ins. long, and make a ½in. step in the middle (Fig. 2).

Drill holes at (A), (B) and (C). Screw the bracket in one corner of a baseboard 8ins. by 6ins. (see Fig. 3), taking care to countersink the screws ½in. below the centre of this bracket. Screw the stepped bar so that it projects beyond the bracket but, because of the step, does not touch it. This stepped bar must be able to move freely, so that you will find it advisable to use a washer and to adjust the size of the hole (C) accordingly.

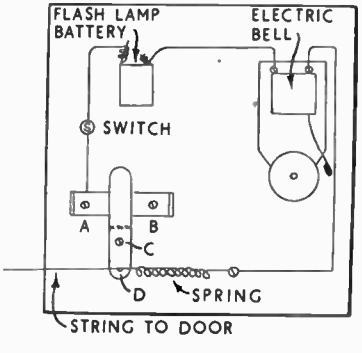


Fig. 3

Attach a spring to the hole (D) and fix this to the base in such a way that when the spring is closed the copper arm is held firmly against one of the turned-up ends of the bracket.

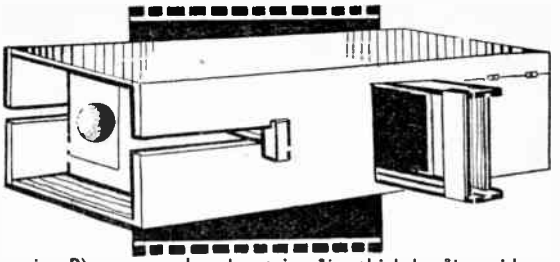
Now fasten a string to the door of such a length that the movable arm is held in the 'off' position. This will extend the spring (see sketch).

Connect up to switch, battery and bell as shown. When the door is opened inwards, the tension on the spring is relieved. The spring returns to its normal length and pulls the movable arm against the bracket. This completes the circuit.

The relative position of the string and spring will depend on where you wish to put the alarm and whether the door opens inwards or outwards. Knowing the principle on which the alarm works will enable you to make the necessary adjustments. (123)

For the winter evenings—

A HOME-MADE MAGIC LANTERN



THE making of magic lantern slides is not a difficult art, and the showing of one's snapshots to a large audience by the use of them is an interesting pastime. The magic lantern also has a more practical use in the showing of slides to illustrate a lecture or talk. The model explained below takes the standard 3¼ins. square slide.

Wood of ¼in. thickness is used for the main body of the lantern. A top and bottom, each measuring 1ft. 7ins. long by 6ins. wide, are first prepared, followed by the two sides, which are of identical length but 6½ins. wide.

At the front edge of each side a 3½ins. long and ¼in. wide slot is cut, this being halfway up the height (see drawing A). With its outside edge at 8ins. from the front edge a 3¾ins. high by 1⅛in. wide rectangle is taken out with the fretsaw; the position of this opening on each side is also shown at (A).

To permit access to the lamp a door is made at the back of one of the sides. This is done by sawing down a line parallel to but ¾in. away from the top edge for a distance of 7ins., and sawing across from the bottom edge to connect up with this. The rectangle thus sawn out is hinged into place with small fancy hinges. This, with certain other detail, is illustrated at (B).

The four sides of the main body can then be glued and pinned together to make a box framework of 6½ins. square end-section. A piece of wood 6½ins. square is then glued and pinned over the back of the body, and through the middle of this a 1⅛ins. diameter hole is bored. A lampholder of the type having a push-pull switch in the body can be passed through this hole, being held in position by the shade-carrier ring on the inside. The flex from the lampholder is fitted into an adaptor or plug (drawing B).

An ordinary double-convex cycle lamp glass makes a good lens for this lantern. This is slightly more than 3ins. in diameter.

A piece of plywood 5⅞ins. square has a 3⅛ins. diameter hole cut from its centre to take the lens, while a 2⅞ins. diameter hole is cut in the centre of each of two pieces of cardboard 4½ins. square. One cardboard plate is accurately centred over the hole in the wood and is glued there, the cycle glass is dropped into place, and the second cardboard plate is glued above it.

Small wooden fillets ¼in. square are glued and pinned at top and bottom of this fitment so that it will just slide along the inside of the box; a sectional view through this fitment is shown at (C). Two small wooden knobs are made, and a screw passes through each into the edge of the fitment, each of these knobs fitting into one of the slots on the body. With their help the lens mount can be slid along the body quite comfortably.

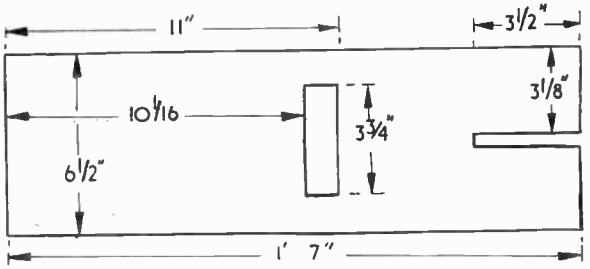
The lens just described is known as the objective lens, and it is also necessary to make and fit a condenser lens.

This is made up in much the same way as before, but this time two such lenses are prepared, and the wooden mount is made 6ins. square. Having made two separate lens frames they are joined together at top, bottom, and along the edges by strips ⅜in. thick by ¾in. wide; a sectional view through the assembled condenser lens is shown at (D).

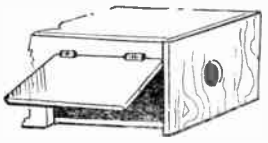
At this stage the inside of the lantern body can be thoroughly glasspapered and given one flat and one high-gloss coat of white paint. When this latter has dried the condenser lens can be permanently fitted into place immediately behind the rectangular slots cut in the two sides.

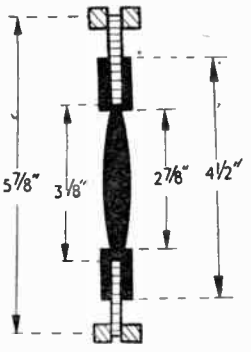
The frame to take the slides is the next item to be made and fixed.

Two pieces of ⅞in. wide by ¼in. thick wood, 1ft. 2½ins. long are taken and down the centre of each a groove ⅜in. wide is worked to a depth of ⅛in. With outside edges at ½in. from the ends of these, slots ⅝in. wide by 3/16in. deep are cut on both edges of each grooved strip, and the framework is assembled by gluing and pinning four strips of plywood, 3⅝ins. long, into the slots (see drawing E).



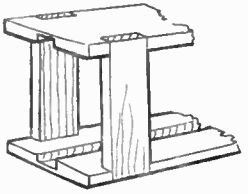
A


B



C


D


E

It is absolutely essential that this slide be made to exact measurements and dead square, and it should be well tested with an actual lantern slide to see

(*Continued foot of page* 84)

An enthusiast's notes on

ROACH FISHING IN WINTER

ROACH fishing is at its best during the winter months. From October onwards you stand a good chance of catching the patriarchs, the big ones that come nosing around the lie-ups and slacks close inshore when the river is rising after rain.

Other reasons why roach are likely quarry at this time of year may be summed up as follows: There is generally some colour in the water in contrast to the gin-clear, low waters of summer; the weeds have died down, and their natural larders are less well-filled with food; there is little or no traffic on and about the streams; boating, bathing, and picnic parties are gone. Thus there is less disturbance for the angler—and the fish. The latter are also in their finest condition now.

Points to Remember

The colder the weather, the deeper will the fish keep in the water. Therefore, when frost prevails, try the deepest places.

If the river is in flood the roach will come inshore to escape the heavy current. They then frequent corners, lie-ups, eddies under the bank, slack water, ditch-mouths, and similar spots. As the water recedes when the flood-water runs off and begins to clear again, the fish will move out once more into the centre and their usual swims.

Under frosty skies, roach will mostly be lurking in the deeps, but as the sun warms up the water during the day they will return to shallower water. The best time to seek them, therefore, is in the early afternoon when the warmth of the sun—such as it may be—has taken a little of the icy sting away.

Choose, if you can, a day of mild, calm conditions, a water nicely ale-coloured, some cloud overhead—such days as we occasionally experience during November and early December. Make a point of clothing yourself to meet the weather conditions prevailing, and take a hot drink with you—tea or Bovril will do nicely.

You should seek the inshore eddies and swims towards midstream. Roach often bite well on a rising water.

Baits

Baits for roach are many, but at this period—the colder months of the year—you may rely upon just two or three, plus a little ground-bait. In case you do not know how to make this, try the following method. For 'Cloud' ground-baits dry an old loaf in the oven, after cutting it into slices, then pound or grind it up into a powder, add a spoonful or two of condensed milk and a little sugar, and mix all together thoroughly. When at the waterside, damp the stuff and make up into little balls, ready to drop into your 'swim'. It will sink slowly and dissolve. (Cloud ground-bait is the thing for the quieter waters. When fishing heavy or streamy waters use bread-and-bran ground-bait).

Regarding hook-baits, the likeliest of all, perhaps, is a cube of bread crust. Even on cold days roach will often succumb to its attraction.

Worms are next in order. Lobworms, after a flood, are killing and, whatever the conditions, you can aways venture the tail-end of a lob, fished on ledger or float-ledger tackle. There are times when it is a real winner; moreover, big fish fall for it.

Red worms in a slightly coloured water are also winning baits. See that they are bright and lively, and keep them in fresh clean moss for a day or two beforehand. If you are likely to be fishing regularly during the winter, get up a stock of these worms, and keep them in an old tub or barrel half-filled with leaf-mould and bits of old sacking, with a layer of moss on top. Inspect periodically and remove all sickly or dead ones.

Collect sufficient for a day's fishing a little time ahead, and place in a porous flower-pot in fresh, well-washed moss to toughen and brighten them. Some anglers I know sprinkle a little milk on top, but there's nothing in this 'tip', I fancy. If prolonged bad weather or some other cause prevents you from going on the day appointed or for some time after, return the baits into the stock tub.

Maggots are also much used in winter, but in very cold weather are apt to lose their lively wriggle much quicker than worms when in the water. To keep them lively, place in a suitable tin and carry them to the riverside in your trouser pocket. And don't leave the tin on the frosty bank whilst fishing—the frost doesn't suit them Keep the tin in your pocket or in your bag or basket when not actually in use.

Tackle

For tackle, the usual roach-rod or general rod, is required, with 40yds. of undressed silk line, on a free-running reel of the 'Aerial' or 'Nottingham' patterns. The cast should be at least a yard long, of nylon or synthetic gut, as 'Monoflow', and the hook—No. 12 or 14 crystal or gilt—should be mounted on a short length, 9ins. to 12ins., of 3x gut or nylon. For a float, use a light quill for quiet waters, and a heavier tapered cork float when fishing a strong stream. In a heavy current a big float is needed to carry plenty of split-shot or lead to keep the cast and bait near the bottom.

Remember, also, that when roaching in winter you may hook a hefty chub or a grandfather perch if fishing with worm or maggot (as a rule only roach will sample bread crust on cold days), and therefore your bottom tackle must be strong or disaster may well occur.

The advantage enjoyed when roaching in winter is that you may catch a few of the bigger ones, and you may locate them in good numbers collected in some eddy or lay-by under the bank. And when that happens, your luck is certainly in. (121)

Home-made Magic Lantern—(*Continued from page* 83)

that it holds the latter comparatively firmly, yet still permit of easy slide changing.

To test out the magic lantern set it up about 6ft. away from a suitable distempered wall or sheet stretched across the wall. Fit a 75 watt bulb in the lamp-holder, connect up to the power source, and switch on.

Put the slide carrier into one of the slots in the body and let it pass across the latter and out of the slot at the other side. It should be found that there is just sufficient clearance for the slide to move freely.

Take a magic lantern slide, put it in the slide holder from the end (putting the slide upside down) and slide the carrier through the body until the image appears on the screen. By means of the knobs on the objective lens mount, focus the image by sliding the mount along the slots until the image is perfectly sharp. No further adjustment of the lens is necessary while the lantern is set at that particular distance from the screen.

When the first slide is in position a sufficient amount of carrier will be projecting through the other side of the body to allow a second slide to be put in place there. The image of this is thrown on the screen by pulling the carrier forward again, thus allowing the first slide to be removed and a third put in its place.

After tests have proved the lantern satisfactory, the outside of the body can be glasspapered and the whole given two coats of paint. (479)

Step-by-step instructions for
A CROSS-BOW

WITH a useful range of some 50yds., this cross-bow is a fascinating, one-evening project. Construction has been simplified to a degree, and no special materials are required. A general idea of the finished article is given in Fig. 1.

Main wood parts for the barrel and bow are shown in Fig. 2. The bow and leaves should be made from birch strip, and note that the bow itself tapers towards each tip. The two leaves—one 8ins. long and the other 5ins. long—need not be tapered.

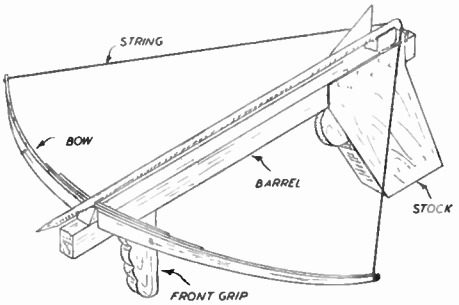


Fig. 1

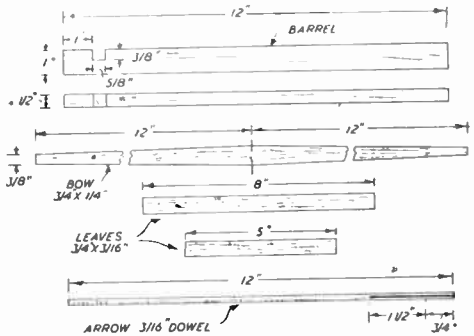


Fig. 2

Stock and Trigger

The stock and trigger assembly are shown in Figs. 3, 4 and 6. The stock sides (Fig. 4) are fretted out from $\frac{1}{16}$in. ply, the trigger from $\frac{1}{2}$in. ply. The two small pieces for the arrow rest and string release are dimensioned as shown.

When all the necessary parts have been cut out, start by assembling the bow—Fig. 5. The bow and the two leaves slot into the barrel and are glued in place. Bind the bow to the leaves at the centre, as shown. This joint is backed up with a triangular block forming the front arrow guide.

The complete assembly, together with the trigger assembly, is shown in Fig. 6. The front grip is optional. If used, it can be fretted out of $\frac{1}{2}$in. ply, glued and screwed to the barrel. Work to the main dimensions given and shape for hand grip.

The trigger mechanism should be clear from Fig. 6. The trigger itself and the release lever are fretted out of ply and pivoted on short lengths of dowel passing through each ply side. Final action is to pull a small length of wire down into a bush through the rear of the barrel, releasing the bow string. A light spring returns the trigger to normal or 'firing' position and raises the wire to engage the bow string. The guide or string release holds the bowstring clear of the rear arrow rest so that when triggered it springs forward, striking the arrow and propelling it forward.

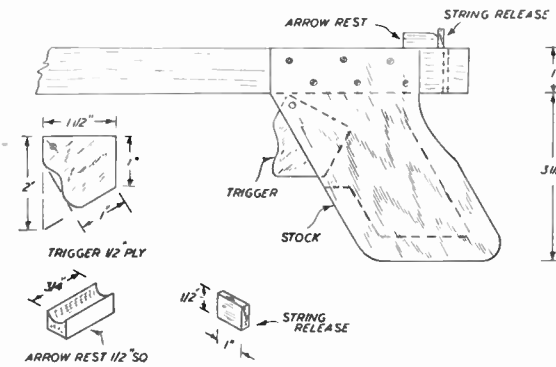


Fig. 3

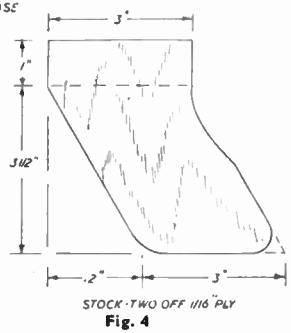


Fig. 4

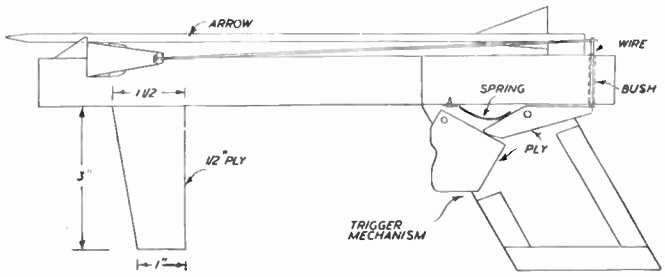


Fig. 6

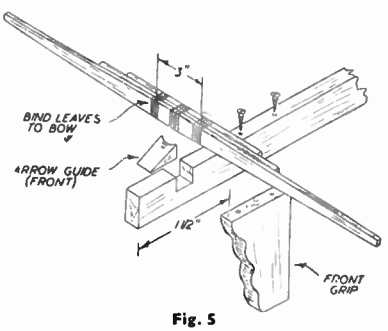


Fig. 5

Assembling the Mechanism

To assemble this mechanism, screw and glue one stock side in place and then mount the trigger mechanism on dowel. Check for the required movement and then screw the other stock side in place, filling in the outline with $\frac{1}{2}$in. thick material. The stock can then be carved and glasspapered to any suitable shape.

The bow is 'strung' with linen thread, or similar thin strong twine. Tension should be so that the bow has an initial set of about 1$\frac{1}{2}$ins. Bind the string well to each end, as shown in Fig. 7.

The arrow is simply a length of $\frac{3}{16}$in. diameter dowel, sharpened at one end and slotted at the other. A card fin or 'feather' is glued into this slot, the arrow being bound with thread or cotton on each side. Notch the end of the arrow slightly (Fig. 8). Bend the card fin so that the two 'feathers' are approximately at right angles to one another. When in place on the 'gun' with one feather vertical, these will now clear the barrel assembly when fired.

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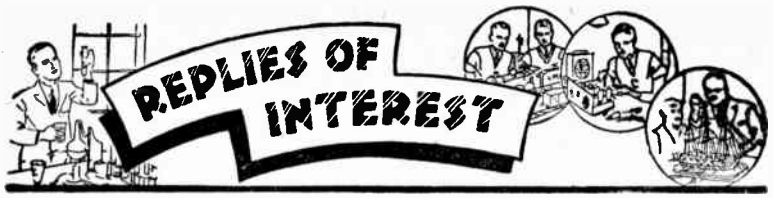


Making a Transformer

COULD you tell me how to make an A.C. transformer of an input of 250 volts and an output of 2, 6, and 12 volts? This I require in connection with a battery charger I am making. (E.F.—Shotton Colliery).

ASSUMING you use a core of 1 sq. in. cross-sectional area, you can use eight turns per volt. 2,000 turns will be needed on the primary; 16 turns, 48 turns, and 96 turns for 2, 6 and 12 v. windings. Good insulation must be maintained. Interleave thin paper between each layer on the primary, and use tape or similar material to insulate the low-voltage windings. Do not overlook that some drop will arise in the rectifier, and that approximately 2·8 v. D.C. is required to *charge* a 2 v. cell. Accounting for these losses, windings of 4, 12 and 24 volts may be required, and would be usual for 2, 6 and 12 v. charging. The S.W.G. of the windings will depend upon space available on the bobbin, and the currents it is desired to obtain, and may be determined from wire tables. For moderate rates, 32 S.W.G. 'enam.' can be used for primary, and 18 S.W.G. for secondary.

* * *

Pin-Hole Camera

HAVING read the article on how to make a pin-hole camera, I am interested to know whether I could convert an ordinary box camera to do the job. I could cope with the constructional part but wonder if I could retain the spool winding action and use the standard 120 film, e.g. Ilford, Selochrome, Dufay, etc. The shutter action and the lens are both broken in the camera, but the interior is in good condition; whilst not considering it good enough for repair, I think I could possibly have a bit of fun with the remains. (F.E.J.—N.W.6).

YOU can quite well use a discarded camera body for pinhole work and thus take full advantage of the winding gear, etc. To do so, the pinhole is made in a piece of tin-foil which is then secured across the lens opening—which is cleared of other items. In a box camera, fitting the foil is particularly easy. As your shutter does not work, you will have to make a simple plug cap to close the front opening when not taking pictures. Make the pinhole with a No. 8 sewing needle as the diameter given can be treated as about f/56×60 for getting the correct exposures for the films you mention, from any chart. That is to say, you get the correct exposure for f/56 and then multiply by 60. Lines taken as described in the article, drawn on top of the camera and extended in imagination, will show what will appear on the film. A pinhole fitted to an existing camera need not be in the exact position of the old lens as the pictures will be in focus wherever it is, but the further away it is from the film, the bigger will be the rendering.

* * *

Cleaning New Furniture

I WOULD like to know the correct way to clean brand new furniture. I have always maintained that new furniture should not need polish as it is already highly polished, and have always understood that a window-leather wrung out in a proportion of vinegar and water, was the correct way. Also I am having a new carpet; is it true you should not use a carpet sweeper on it for about a month, so as to give the pile time to settle down? Our hall and kitchen will be comprised of beige square bricks; is there a correct method of keeping them nice, and lastly, is paraffin the proper thing to use when cleaning lino, instead of scrubbing it with soap and water? (J.M.—Leicester).

ALL newly polished furniture should need, is a rub over with a soft cloth. When the polish becomes dim, use Mansion polish, a very little on a cloth, to bring up the lustre again. Regarding your query re not using a carpet sweeper for a month or so on a new one, we have not heard of this before. There may be something in it, however, and after all, it is no particular loss to leave the carpet for that period, is it? The bricks you mention are, we should think, tiles, and if unglazed, can be cleaned by scrubbing with soap and water, sprinkling the tile meanwhile with Vim or similar. Lastly, lino should not need cleaning with a scrubbing brush at all; it only needs sweeping to remove dust and then polishing with a proper polishing mop and Ronuk or other suitable floor polish. This restores the natural lustre and preserves the lino as well.

* * *

Aquarium Sand

WILL ordinary silver sand be as good as river sand for the floor of an aquarium? Also, could I include a few of the tropical varieties with my goldfish, or would they die being in ordinary cold water? (T.H.—Finchley).

IF you cannot obtain river sand, ordinary builder's sand can be used for the floor of the aquarium. The coarsest sand will be the better, or even fine shingle will serve. With regard to keeping tropical fish—you would be wise to wait until you can fix up a separate tank suitable for the warm water species.

A Crossbow—(*Continued from page 85*)

To operate, pull back the bowstring and engage with the extended wire. The bowstring rests on top of the string release. Lay the arrow in place on the front and rear guides. When the trigger is pressed, the string should fly forwards, striking exactly the notch in the end of the arrow and propelling the arrow forwards.

Warning

A word of warning. Having made the cross-bow, use it sensibly—for practice on a suitable target. Do not point it towards people or animals. (425)

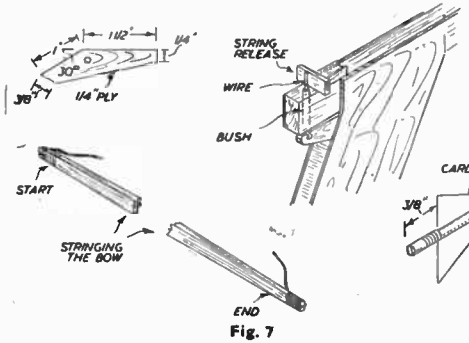


Fig. 7

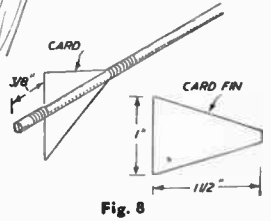
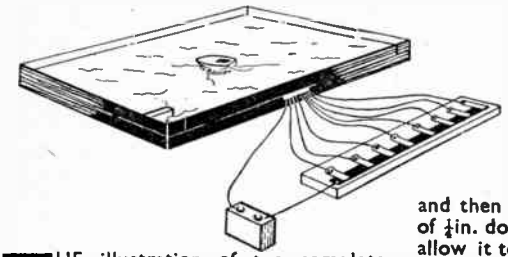


Fig. 8

Spend some merry hours with this

ERRATIC BOAT GAME



THE illustration of the complete model shows a small wooden boat floating in a tray of water. The boat can be guided by depressing the keys on the control board, and the aim is to get the boat into the 'harbour'. However, as soon as anyone learns the sequence of the keys to be pressed, the wires can be led to different keys and the problem is as fresh as ever.

Underneath the tray of water are a number of coils with metal cores. As soon as an electric current flows through a coil, the metal core becomes a magnet which may either attract or repel the small permanent magnet concealed in the boat. The boat thus moves in somewhat erratic fashion about the surface of the water.

Making the Coils

By means of a washer-cutter or fret-saw, cut out discs of wood 1in. in diameter (Fig. 1). Through the centre of each drill a ¼in. hole. These are the end pieces of the formers on which the coils are wound. To make the tube connecting the end pieces, cut a strip of paper 6ins. by 2ins. Make one surface of the paper tacky with glue and then roll the paper around a piece of ¼in. dowel rod. Slip the tube off and allow it to dry before gluing on the end pieces to make the complete former (Figs. 2 and 3).

On to this former, carefully wind No. 28 D.C.C. (double cotton covered) copper wire, leaving two free ends as shown in Fig. 4.

With a hacksaw cut off 2ins. lengths of round iron rod and push these pieces into the coils to form the metal cores.

The Lower Tray

The lower tray holds the coils and is 14ins. long and 8ins. wide. These measurements can, of course, be altered to suit the reader's requirements, but the tray must be 1in. deep. The base of the tray is plyboard and this is tacked on to the frame with ½in. nails.

Fig. 5 shows the completed tray. Notice the groove cut in one side to provide a passage for the wires from the coils to the battery and key board.

Arrange the coils in position (Fig. 8) and fix them in place with strips of tape and drawing pins.

The Upper Tray

Cut out a stout piece of cardboard 16ins. by 10ins. and mark it out as shown in Fig. 6. With a sharp knife cut where indicated, score along the dotted lines and bend into shape (Fig. 7). Carefully glue the corner flaps and press into place; it is most important to have strongly made corners. When the tray is quite dry it can be made waterproof.

There are many ways of making the tray capable of holding water but one of the easiest is as follows. Chip some paraffin wax into a can and hold it over a flame until it melts. Pour the molten wax into the tray and tip the tray so that the wax runs over the whole of the inner surface. it sets almost immediately and makes a good waterproof lining.

The Control Panel

Cut out a base 10ins. long, 3ins. wide and ½in. thick. Along one edge tack down a ½in. wide strip of brass (Fig. 9).

Fig. 1

Fig. 2

Fig. 3

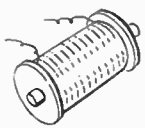


Fig. 4

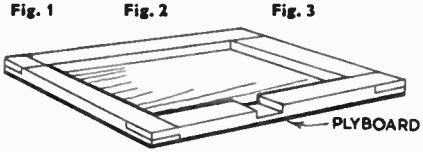


Fig. 5

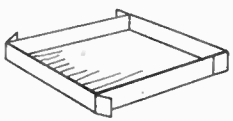


Fig. 7

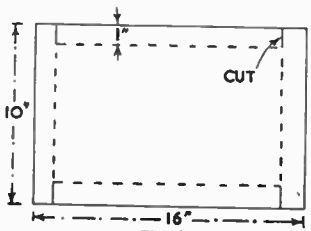


Fig. 6

Fig. 10

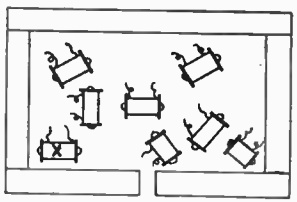


Fig. 8

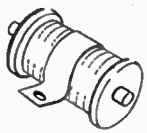


Fig. 8(a)

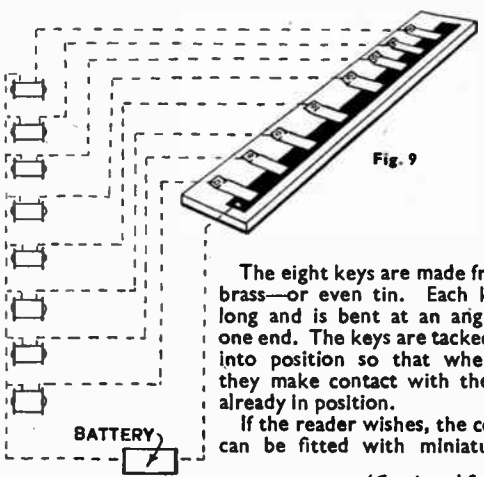


Fig. 9

The eight keys are made from 'springy' brass—or even tin. Each key is 2½ins. long and is bent at an angle ½in. from one end. The keys are tacked or screwed into position so that when depressed they make contact with the brass strip already in position.

If the reader wishes, the control board can be fitted with miniature switches

(*Continued foot of page 88*)

Here are some helpful hints for HANDICRAFT WORKERS

RUNNING a handicraft shop, one realises the various difficulties of the customers concerning the supply of the various stains, varnishes and finishes of all types. This article, in brief form, should interest many readers.

If you have undertaken some basketwork, then you may need to dye it when finished. For this you use 'Tintex' Dye. This can be had from handicraft shops at 6d. a packet. Normally the shades are red, royal, gold, jade, old rose, orange, emerald, rust and primrose. Full instructions for use are on the packet.

Various Finishes

Some may use plywood bases for egg stands, picnic baskets and toast rack bases. Here you would use, for best results, heat resisting varnish. 1oz. bottles are 1/2 and 2oz. bottles 2/-. For enamels you could use such brands as 'Crusoe' art enamels. These will also do admirably for wood, pottery, glass, pewter, cloisonné, papier mâché or paper. This will help you to economise in your purchases if you are making up gifts. Incidentally, these can be all carefully blended with turpentine substitute.

Raffia work is interesting, and here you have about twelve to fifteen shades and no colouring to do afterwards.

For gift lines you may decide on cork mats. These you buy, possibly, plain, but you can choose your own decoration ideas to the fullest. These may be stencilled with oil colours or enamels, but a light designed edge probably looks best.

Stool seating material is mostly seagrass, which you buy ready for use, and, therefore, you have no worries in regard to shading. It is mostly in hanks of approximately 1lb. and shades of brown, nigger, orange, red, blue, green, and often in two-colour contrasts such as green/natural, orange/natural, brown/natural and brown/orange. 1lb. is, as a rule, enough for a medium-sized stool.

Pokerwork is another interesting craft, but a good electric pokerwork machine costs anything up to £5-17-6, so that you would have to be sure of a market before you invested in this amount.

The covering of boxes with parchment is an absorbing craft and best done in the popular neutral tint of parchment. If you are artistic, you can decorate these with oil painting, water colours, Mandarin inks, barbola or sealing wax. Also, if you wish, you may use felts. Some art and craft firms supply all types of boxes ready made. This is an ideal line for bazaars round about Christmas.

Pottery

Many very beautiful articles can be made in pottery, and art firms now supply a good selection of ware ready for painting. These are already glazed and completely waterproof. You can use sealing wax, barbola or enamels. A good enamel is 'Thistle', a plastic type. Poster colours are effective, but remain 'flat' and not bright, although this is often preferred by many people. To enliven this you can use 'Winton' matt varnish.

Saree relief painting is another very fine craft, and if you call at any good art and craft shop you will see this demonstrated. It provides an outlet for the craftsmen with aptitude for making his own designs. Briefly, one works out his design in outline. The paint is supplied in 3in. tubes and is available in about fifteen colours. A nozzle is fitted to the tube and then squeezed on the fabric. Outlines in gold, bronze and silver are available. This idea can be used on wood, glass, parchment and pottery.

Artificial Flowers

Artificial flower making is another interesting hobby, and can be most useful when one is confined to bed or as a hobby for an invalid. Art firms supply leaves, green covered wire and special tape. All these can be used with wax or paper flowers.

Choice of Adhesives

Gums and glues sometimes muddle up the aspiring craftworker. For bookbinding use 'Atlas' cold water paste powder. Another handy vegetable glue is 'Gluak' which does not require heating. For woodwork one cannot do better than 'Croid', 'Acrabond' or 'Seccotine'.

A good adhesive for felt, leather, upholstery, canvas and applique work is Bateman's rubber paste. It is also waterproof. Bateman's rubber solution is best for use on leather, skiver or similar surfaces. 'Romac' rubber solution should be used when sticking leather to skiver. (117)

Erratic Boat Game—(*Continued from page 87*)

but this, of course, will be much more expensive.

The wiring is shown in diagrammatic form in Fig. 9. The connections can be made with the surplus of the wire bought for making the coils. The leads are best soldered on to the brass keys. Use a 2 volt battery, but increase to 4 volts if the boat is too sluggish.

The Boat

The boat can be easily made with a pen-knife and should be about 1½ins. long and about ½in. to ¾in. wide. Hollow the boat out so that it is able to hold a small permanent magnet. The magnet should be as strong as is possible to get. The writer has had very good results with those magnets on which small metal dogs are mounted. When the magnet is housed in the boat it can be covered with a strip of paper and the boat then painted.

The 'harbour' is simply a small block of wood placed in one corner of the tray. It should be about 3ins. long and will be too heavy to float in the shallow water. Do not attempt to fix it permanently into position, as this might cause the tray to leak.

Notice how one of the coils (marked X in Fig. 8) is placed immediately beneath the harbour.

The actual number of coils used depends on the size of the model. If too few are used the boat will become stationary if it is outside the magnetic field of the nearest coil. (415)

Instructions for building the ARCHWAY TO THE GALLERIED INN

A real galleried inn. The famous 'George Inn' at Southwark, London

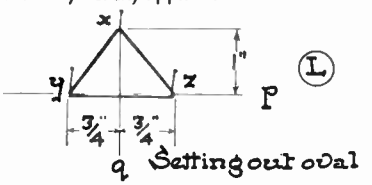
HAVING made the main inn model, the construction of the archway and courtyard extension will prove to be a straightforward job, as many of the parts of the first model are repeated on this. The two sides (A)—the reference letters refer to the diagrams given in connection with the present article—are exactly the same shape as the sides of the inn model, but note that one is $\frac{3}{8}$in. thick and the other $\frac{3}{16}$in. thick. The ridge (C) is $3\frac{7}{16}$in. long, thus making the overall length of the model 4ins. There is no real base, though for strengthening purposes, a piece of metal (J) 6ins. by 4ins. may be employed.

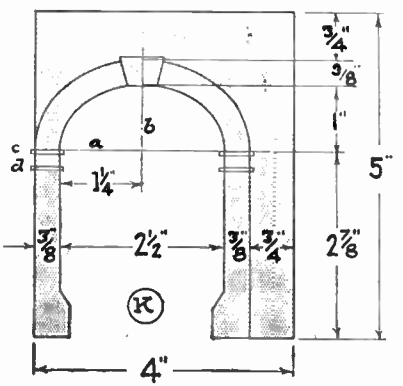
False Wall

There is what might be called a false wall (H) and false top (D) spaced as in the diagram. Part (H) is supported by spacing pieces (F) and (G), which run right across the width of the model. They are $\frac{3}{8}$in. wide. The depth is immaterial. It can be, say, 1in. Part (D) is supported by a strip (E), which is of, say, $\frac{1}{2}$in. square section.

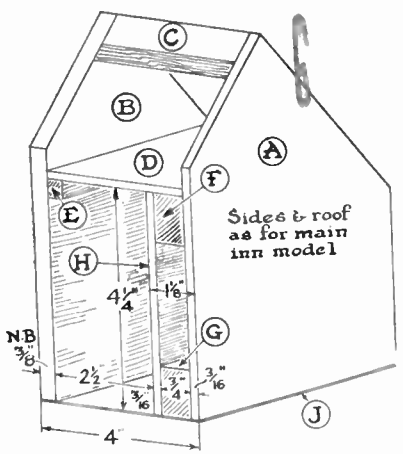
The front (K) is now laid out. The only point calling for special attention will be the semi-elliptical arch. First draw in the centre lines (a) and (b). Let these correspond to centre lines (p) and (q) in the diagram (L) above. Partly drive in three fine panel pins at points (x), (y) and (z). Tie, neatly, a triangle of cotton thread around these, taking care that it is taut and the knot firm. Then remove pin (x). Put the point of a pencil here and move it round, letting it bear against the cotton thread. A perfect ellipse to the size required will be drawn. (Only half is needed.) The outer ellipse is $\frac{3}{8}$in. away from the first. The keystone may be cut from a piece of cardboard and glued on. Indeed the whole of the arch-surround can be a thin overlay. The mouldings (c d) can be of matchstick glued on.

The front is now tacked on and the roof (exactly as for the inn model, complete with one dormer window but no chimney stack) applied.





Dimensions of the archway front



The main structure for the archway

As regards decoration, a whitewashed brickwork or a stucco effect might be aimed at. Poster paint would give the effect if not too bright and new.

No Backs

It will be appreciated that there is no back to these models; it is not really necessary unless the model village is so arranged that spectators can walk all round. In such a case, however, suitable backs can be provided. A very pretty effect is provided by having flash lamp bulbs inside and suitable window 'glazing' so that, if the lights in the room are turned down, the lights of the model village can be turned on and the effect of a village by night is obtained.

Essentials Only

These models show just the essentials. The reader will add details. For example, a rain water pipe is shown in the main picture. One of the stone fenders at the bottom corners of the arch can have a bit chipped out. (These fenders, by the way, can better be moulded up in plastic wood.) Try, wherever possible, to base your model on an existing one. You may not find one exactly like the model, but old woodwork, brickwork, plaster, etc., are pretty much the same anywhere. The photo shows the famous galleried 'George Inn' just off the Borough High Street, Southwark, London, which gave the present writer some inspiration, but the present model is not directly based on this particular inn. (493)

Watch for the next in this series of articles—due for publication in a fortnight. It is for a stage coach, and includes full size patterns.

Experiments with acetic acid in HOME CHEMISTRY

WE have been drinking acetic acid all our lives in the form of vinegar, of which it is the essential ingredient. Vinegar contains three to eight per cent of acetic acid and is usually made by fermenting sour wine or beer with a bacterium called mycoderma aceti.

The acetic acid we need for these experiments is the strong, or 'glacial', acetic acid. It derives its name 'glacial' from its property of freezing to an ice-like mass in cold weather.

The freezing point of glacial acetic acid is 17 degrees Centigrade (water freezes at 0 degrees). Yet, curiously enough, its temperature can fall much below 17 degrees without its freezing, so long as it is left undisturbed. But if you shake the bottle the whole mass solidifies almost at once. This change is startling and worth trying on a cold day.

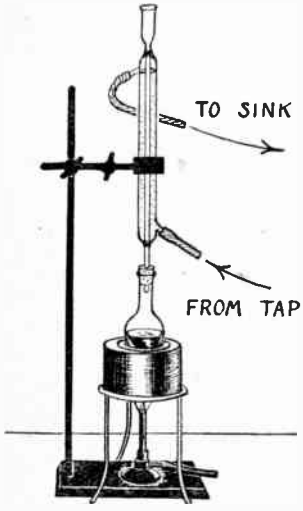


Fig. 1

The bulk of the world's industrial supply of acetic acid is made by distilling wood and extracting it from the distillate, and also by a synthetic process from acetylene.

Acetic acid is an organic chemical, since it contains carbon, and is much used in organic chemistry, both as a solvent and for preparing a large number of organic chemicals.

One of these organic chemicals is ethyl acetate which we can prepare with simple apparatus. Using a measuring cylinder, measure out 10cc. of concentrated hydrochloric acid and pour it into a 250cc. flask. Then add to it 30cc. of glacial acetic acid and 40cc. of methylated spirit. Mix the three liquids well by revolving the flask. Pour a few drops into water and notice that it dissolves completely.

Now connect the flask with an upright condenser and heat for three hours on a boiling water bath, as shown in Fig. 1.

'Boiling Under Reflux'

This method of boiling liquids is known as 'boiling under reflux'. If you boiled in the open flask you would lose most of your liquid. Under reflux, the vapour is reconverted to liquid in the cool condenser and runs back into the flask. In some chemical processes liquids are boiled continuously for several days and nights with negligible loss by this method. The water bath is replaced by gauze or oil bath when higher temperatures are needed.

During the heating the acetic acid combines with the ethyl alcohol in the methylated spirit, the hydrochloric acid acting as a catalyst.

After three hours pour the contents of the flask into cold water in a beaker. You will find the liquid no longer dissolves completely, but that an oily layer floats on top of the water. This is crude ethyl acetate and contains a little methyl acetate formed from the wood spirit contained in methylated spirit. It also contains hydrochloric acid.

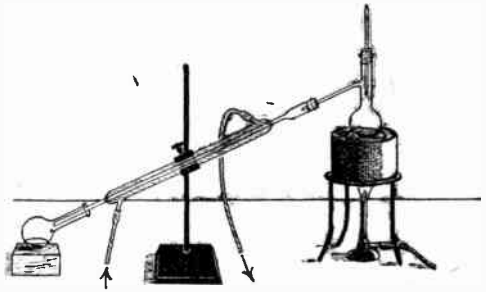


Fig. 2

To purify it, pour the water and ethyl acetate into a stoppered separating funnel and shake well for a few minutes. Allow the two layers to separate again by standing a moment and then run off the lower layer of water. Add more water and shake and allow the layers to separate again. This process helps to wash out hydrochloric acid and other soluble impurities.

Now pour the ethyl acetate into a dry bottle and add a little chalk (to free it from the last traces of acid) and a few pieces of calcium chloride (to remove water).

After standing overnight pour off the ethyl acetate into a dry distillation flask, fitted with thermometer and condenser and distil from a water bath, as shown in Fig. 2. A couple of tiny pieces of broken pot will help to smooth the boiling if placed in the flask. Collect in the receiver the portion which distils from 74 to 79 degrees, and bottle this for your chemical stock. You will find it has a pleasant fruity smell.

Ethyl acetate is an 'ester', that is, a compound of an alcohol and acid. Esters thus have a similarity to salts, which are compounds of metals and acids. Many thousands of esters are known and some are used as flavourings. Amyl acetate ('pear drops') is an ester familiar to most of us.

Preparing Acetamide

Acetamide is another interesting organic compound which we can prepare from acetic acid. It is made by first boiling and then distilling ammonium acetate, the latter being made as follows.

Warm 20cc. of glacial acetic acid on your water bath and add solid ammonium carbonate until the acid is neutralised (test this by dissolving a few drops in water and dipping blue litmus paper into the solution). On allowing it to cool the liquid will solidify to crystalline ammonium acetate.

To prepare acetamide, first dry the ammonium acetate by pressing between filter paper and then put it into a flask containing a couple of bits of porous pot. Now add 20cc. of glacial acetic acid and boil for five hours, using the same apparatus as you did for the preparation of ethyl acetate (Fig. 1), but replacing the water bath by wire gauze.

After five hours distil the liquid. The same apparatus which was used to distil the ethyl acetate (Fig. 2) should be employed, but once again the wire gauze is substituted for the water bath. Add porous pot here, too.

When the thermometer registers 100 degrees, run the water out of the condenser, or it may crack later on. Reject the distillate which comes over below 180 degrees. Collect the portion boiling from 180 degrees and upward; this will solidify on cooling to a crystalline white mass of acetamide.

You will notice the acetamide has a smell just like the larder the morning after a mouse gathering! Acetamide is not really guilty for its odour, which is

(*Continued foot of page 91*)

For the handyman—some
HINTS ON HINGING

MUCH of woodwork construction involves the accurate hinging of doors and lids, and otherwise good work can be, and sometimes is, spoilt by bad fitting of these parts. Here are a few hints on this subject which, it is hoped, readers may find useful.

The three most popular hinges are drawn in Fig. 1, (A) representing the butt hinge, universally used. Roughly there are two kinds of this pattern of hinge, the solid brass kind and the cheaper steel pattern. The latter kind, with their thick and protuberant knuckles, are only suitable for domestic kitchen articles such as safes for instance, or common wood boxes where hinging is only of

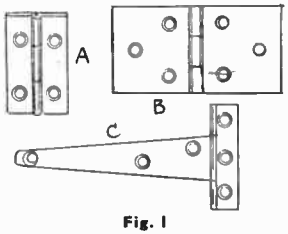


Fig. 1

importance and appearance little or none. Dealing with articles of furniture and fancy things where appearance is really of value, the solid brass butt hinge is the kind to use.

For hinging a door, first place the door in position, and insert a strip of paper under its lower edge to ensure that the door will not, when fitted on, scrape the frame when opened. Mark the position of the hinges by pencilling lines across both door and frame, the length of the hinges apart. If in doubt about a good position of the hinges, place them about a quarter of the length of the door, top and bottom, the quarter distance lines being in the middle of the hinges. Now set a gauge to the width of hinge and centre of pin, as at (D) Fig. 2. and run this down the edge of door and inside of frame. The guide lines, already drawn across the door and frame, should be now squared across the gauged lines. Set the gauge to half the thickness of the knuckle of the hinge, as at (E) and gauge down the door face, as at (F) Fig. 3 and down the edge of the door frame, as at (G).

On these lines chisel out a recess. Replace the door, and if all is right it should be possible to insert the hinges with a push of the finger. If not, the recesses should be deepened a shade, but do not overdo this. Now screw the hinges to the door and then to the frame. A good fitting should result. A point to remember is to buy suitable screws to fit the screw holes in the hinges, so that they can be driven in flush and not stick out. Hinging common wood articles with the steel hinges already referred to, it is only necessary to cut recesses to hold the leaves, letting the whole of the knuckle project outside the article.

At (B) is illustrated that pattern of hinge known as a backflap, a useful kind

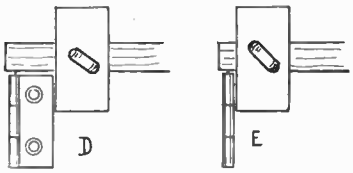


Fig 2

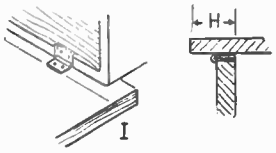


Fig. 4

for hinging flaps of all kinds. Measurements and gauge lines as before for this, except as at (E) as the recesses are cut deep enough to let in the leaves of the hinges only. With the steel variety of these, useful for the doors of rabbit hutches and other domestic uses, it is more usual to fix them direct to the wood, without cutting a recess at all. The gauged lines are struck on the door, or flap only, half the hinges fitted on, then placed and held in position firmly while the hinges are screwed to the frame.

The T-shaped pattern of hinge, seen at (C) is a necessity where a heavy or extra wide door has to be hinged, and the downward weight of such would prove too great a strain on the butt hinge, or even backflap. The door should be laid flat on the bench and the hinges laid in position. No need here to gauge, only do see that the centre of the knuckle is over the edge of the door; eye measurements should be good enough for this. Care must be taken here to bore holes with a bradawl for the screws truly in the centre of the screw holes, then when the screws are driven home the hinges will not be shifted away from their correct position. A hole out of centre will cause the screw to press against the hinge as it is driven in, and so move it out of place.

Put the door in the position it will occupy, with, if a cabinet or other small

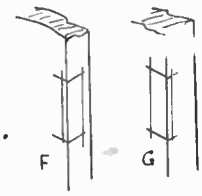


Fig. 3

door, a strip of paper between its bottom edge and the door frame, then screw the hinges to the frame. If a large door, garage or lavatory, for instance, slip a thin wedge underneath to raise the door sufficiently clear of floor or ground, before screwing to the frame

Hinges for boxes can, in many cases, be fitted as detailed above, but an exception must be made when the lid overhangs the box, as is the case with certain designs of fancy fretwood boxes for example. In such instances, the hinges are completely recessed in the top edge of the box first. Then, take measurement (H) in Fig. 4, that from the edge of the hinges to the knuckle and overlap of the lid. A pencil line to this measurement is drawn along the inside of the lid, as shown at (I), then the box laid on its side with the free leaves of the hinges opened out and touching the pencil guide line. In this position they are screwed or nailed to the lid. (497)

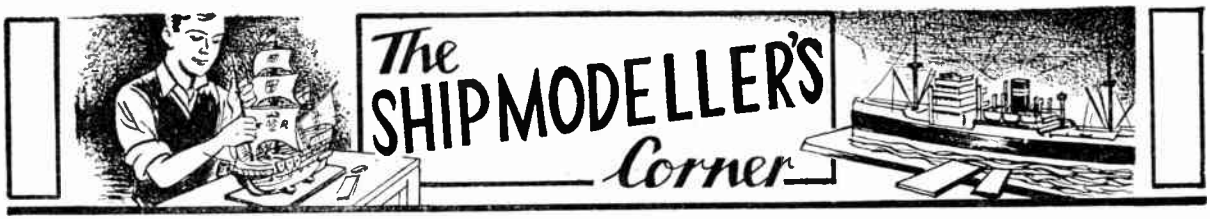
Home Chemistry—(*Continued from page 90*)

due to a small amount of impurity. Very pure acetamide has no smell.

Your specimen of acetamide should be bottled as soon as it is cool, for it is deliquescent.

This compound has the property of combining with mercuric oxide. Dissolve some acetamide in water and add mercuric oxide to it. Warm the mixture, when some, or all, of the oxide will dissolve. If it all dissolves, add more until a portion remains undissolved. Filter the solution, evaporate the filtrate to the crystallisation point and then allow it to cool.

The crystals which form are called mercury acetamide. Drain off the liquid and dry the crystals by pressing them well between filter paper before bottling them. (101)



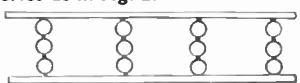
Making Stanchions, Chocks and Cleats, Etc.

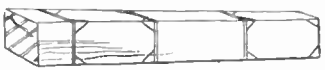
By 'Whipstaff'

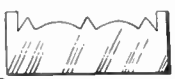
IN the making of period ship models, we come up against the problem of those ornate turned stanchions, especially on vessels up to the eighteenth century. The actual making of these items is not so difficult to those of us who own a lathe, but, for those without, they are often a headache, especially if needed in any numbers.

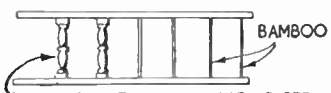
On small decorative models of galleons, etc., we can build them up as in Fig. 1. These consist of a strip of cardboard for a base and a narrower strip for the handrail. These are joined to form a balustrade by means of small pins, small beads being threaded on the pins. When painted the effect is quite realistic.

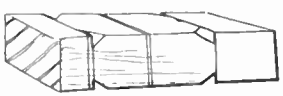
To turn them, for larger models, take a piece of square stripwood (boxwood or holly is the better material), and mark out the pattern of the stanchions in series as in Fig. 2.

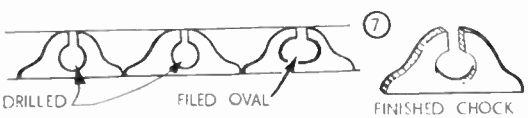












Next turn them to shape in your lathe, finishing off with a scraping tool the shape of your stanchion, to ensure uniform size and shape. This tool can be easily filed to shape from a piece of thin sheet metal. For small jobs they can be filed from a single edge razor blade (Fig. 3).

For small models here is yet another simple method. Make your stanchions of thin slivers of bamboo. Glue them into a strip of cord for the base, with a narrower strip for the handrail and then build up the shape of your stanchions with modelling paste, using a piece of pointed stick to apply the paste.

You can use a proprietory modelling paste or mix your own, using glue, whiting and a little water (Fig. 3A).

Do your modelling before gluing the unit in place on your model. Larger scale stanchions can be cut and filed from a strip of wood marked in the same way as Fig. 1 for turning.

Make vee cuts as in Fig. 4 with a sharp knife and file and glasspaper to final shape, as in Fig. 5, afterwards cutting off each stanchion with a small model saw.

Fig. 6 shows a stanchion turned from brass, with a pin left in either end for securing in position.

Chocks and Cleats

Chocks are heavy blocks, with two horn-shaped arms curved inwards. Ropes run between these arms for mooring, etc.

On small models these can only be very simple and are better made of wire.

For models where scale allows their making in reasonably accurate form, they add much to the finish and appearance of the model.

They can be made of either wood or metal in the following manner. First, obtain a strip of thin wood or metal of the size of the desired chocks and mark them out in series as in Fig. 7.

Next drill the holes as in the sketch and file to oval shape, afterwards rounding off all edges. Blocks can now be cut off the strip. If wood is used, and the scale reasonably large, they can be cut off with a Hobbies model saw; if metal, with a small hacksaw. They should afterwards be glued in position on the model.

Some modern types of chocks have rollers. For small models these can be made up from card with small rollers filed or turned from dowel rod.

If assembled for large scale work they can be in metal, the arms being bent over a wooden former and soldered to a base plate; to make working models the rollers can be drilled and mounted to revolve on a pin.

In these types the arms are more angular and are flattened down over the rollers. Fig. 8 shows the usual types of roller chocks.

Cleats are usually of metal, but can be modelled successfully in wood if a hardwood like boxwood or holly is used.

It is a small fitting with two arms for securing ropes, etc.

For small models make them of wire. Flatten the centre with a centre punch and drill to take a pin for fixing in position; a No. 74 twist drill is the size to use for a perfect fitting.

Fig. 9 shows the wire cleat.

For making larger scale cleats in wood and metal, use the same method as for chocks. Choose a strip of the

(Continued top of page 94)

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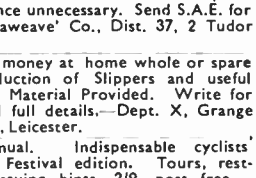

No mechanism—yet walks down any incline in lifelike manner. Simple to make from odd wood. Sells on sight. Patterns, instructions, 3/6
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right scale size and mark out in series. Drill and file to shape and mount on a card base, afterwards glue in position on the model (see Fig. 10).

Rollers or Fair-leads

These are used mainly in liners and naval vessels and in appearance are something like large spools.

For small models they can be assembled by filing and turning fram dowel rod, and gluing in place an a small card base.

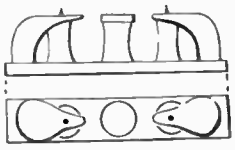
Far larger models file or turn the rollers from waod or metal, drill down the centre and pin to a small card or veneer base. They are then actually working models (Fig. 11).

These small details make for interest and accuracy in model making, and by following these methods they are not difficult to make. Their addition will improve your model and intrigue your friends who see it.

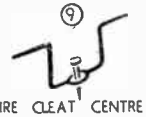
Modellers who visit London are strongly urged to visit the United Services Museum and other Museums to see what accuracy in such small details can be achieved even in such small scales as $\frac{1}{16}$in. to 1ft. I have seen models of modern complicated winches which although not above $\frac{1}{2}$in. in length, were perfect working models.

Do not rush these small details. The patience and time spent will amply repay you in the added finish of your model and will enhance its value.

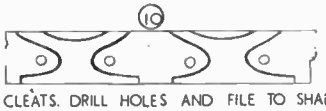
(112)



ROLLER CHOCKS (8)



(9) WIRE CLEAT CENTRE FLATTENED AND DRILLED



(10) CLEATS. DRILL HOLES AND FILE TO SHAPE

(10A) ANOTHER TYPE OF CLEAT

ROLLER FAIR LEADS. DOWEL AND CARD ASSEMBLY

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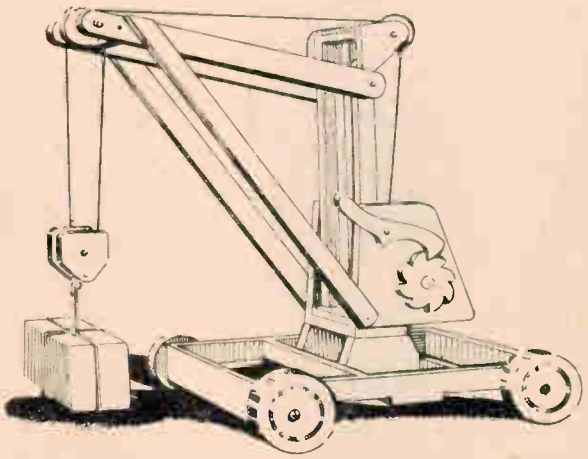
Hobbies WEEKLY

CONTENTS

November 14th, 1951 Price Fourpence Vol. 113 No. 2924

How to make

A WORKING TOY CRANE



THE little working crane we show on this page, could very easily be termed a model although, perhaps, really speaking, it is more of a toy. For a toy, however, we usually look for something made from thickish wood, and with little added detail, and made up sturdily to withstand rough usage. Let us say then that the crane shown here, although strongly made, would not stand up to coarse handling.

Open-Frame Platform

A simple open-frame platform is fitted with four wheels which are carried by round rod axles running through the side rails. Centrally, and on the two cross rails of the frame, the supports for the raised platform are situated. Above this platform swings the body and crane arm together with the back projecting portion in which is housed the winding drum. The winding drum may consist of a small cotton reel which is fixed to a spindle carrying, on one side, the crank and handle, and, on the other, the ratchet wheel and pawl. The winding cord passes round the drum, to which it is fixed, and leads upwards and round a loose pulley at the top. From here it runs forwards and over another pulley at the jib end, and thence down to a sheaf block and then up again to a fastening at the fore end of the jib just at the rear of the pulley. Here it is 'fastened off'.

Our illustration of the finished crane gives a good idea of nearly all the parts and their position. Four well-turned wheels can be bought from Hobbies Ltd. ready to fix to the frame by means of the round rod mentioned. Some pieces of good fretwood should be chosen for the model, and it would be hardly suitable to adopt a soft wood on account of the glued and nailed fixings, which are liable to be weak if the crane is to be used as a toy.

Making a Start

Commence to work upon the platform which carries the wheels. The constructional diagram Fig. 1 shows the side rail as (A), and the length of this is 5½ins., and its width at the ends ⅞in. For a length of 3¼ins. its width is ½in. as shown.

Two of these rails are made, and are held together at their ends by cross rails (B), measuring 4ins. long by ⅞in. wide. All the rails for the platform are ¼in. thick. There are two further cross rails (C); only these are 4ins. long by ½in. wide and their position is seen in Figs. 1 and 2. Yet another cross rail is fixed to the platform, that shown at (D). This is 4½ins. long and 1in. wide, and, in its centre, is a hole to receive the end of the ¼in. rod round which the crane will swing.

Two shaped cross pieces (E) are now cut 1⅝ins. long by 1in. wide, and to the top of these the support piece (F) is fixed (see Figs. 1, 2 and 3). This piece (F) should be 1½ins. long and 1in. wide, and in this also is made a ¼in. diameter hole to take the rod as seen. The two pieces (G) are next cut according to the dimensions given in Fig. 2, including the hole for the axle of the winding drum. The floor (H), to which the parts (G) are glued and nailed, measures 2½ins. by 1in., and a hole is made in this, a full ¼in. so as to move freely round the upright rod

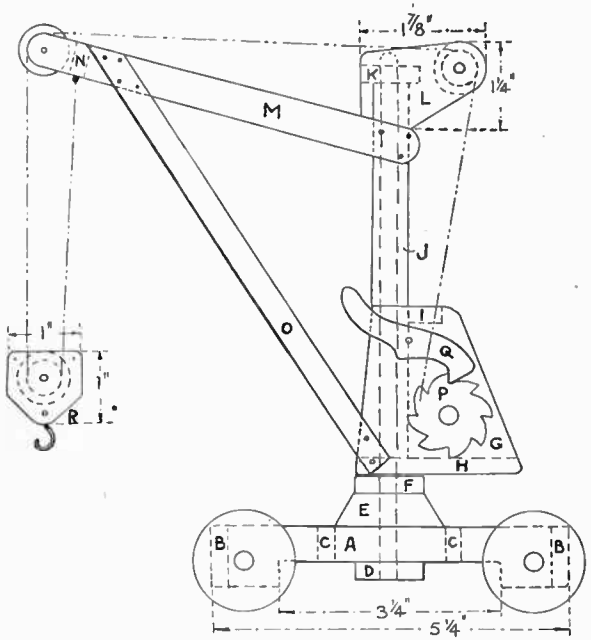


Fig. 1

A corresponding cross rail (I), the same length as (H) but ½ in. only in width, is fixed as shown (see Figs. 1 and 2).

Next prepare the two long uprights (J) from ¼in. thick wood, 5½ins. long and ½in. wide. Glue and pin these to the back of pieces (G) in the position shown, and connect up at the top with the cross piece (K), 1in. long by ⅞in. wide and ¼in. thick. Cut a hole in this piece a full ¼in. diameter for the tip of the round rod to go through loosely. Two pieces as (L) in Fig. 1 are next drawn out, cut to the measurements given, and glued to the outer sides of pieces (J) (see enlarged diagram Fig. 5). Note their positions in relation to the pieces (J) and (K).

The two arm supports (M) are next prepared from ⅛in. thick wood. They are to be 6ins. long and ½in. wide, and the outer end should be cut to a semi-circle while the near end is just rounded as seen in Fig. 1. Bore a hole in each piece to take the pivot of the pulley at the outer end, and then hold the pieces together firmly by adding the short rail (N). This is 1in. long and ½in. wide and ¼in. thick. The two jib pieces (O) are 7⅞ins. long, ⅜in. wide and ⅛in. thick, and they are fitted and fixed to the side pieces (G) at the bottom and to the supports (M) at the top. Hold the one piece first in position and mark off in pencil where it must be cut to get the correct angle. Mark and cut the second piece from this, and finally glue and pin the two to their respective pieces.

The winding gear, including the ratchet wheel (P), the pawl (Q) which engages it, and the crank and handle (S) and (T) must next be made. The wheel (P) is first described as a disc 1¼ins. in diameter and the eight 'teeth' set out by marking first across the centre lines at right-angles and then intermediate lines at 45 degrees. Cut a ¼in. hole in the centre of the disc for the spindle, to which the ratchet (P) must be firmly glued. A piece of ¼in. rod 2¼ins. long must be used, and when the glue has hardened, push the spindle through one side (G) and then thread on the drum which, as mentioned, may consist of a cotton reel cut down to fit between the two sides (G).

Glue the drum to

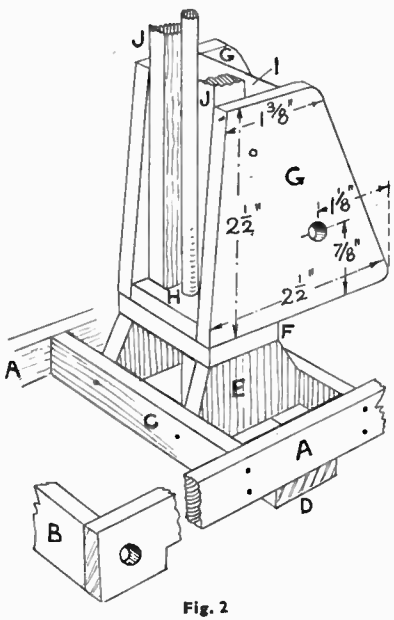


Fig. 2

the spindle, filling in with little wedges of wood to take up the space round the spindle, this latter being less in diameter than the hole in the drum. The spindle, it will now be found, projects about ⅝in. beyond the face of (G) on the opposite side from the ratchet disc. Now make a crank as (S) in Fig. 4 1⅛ins. long and 1¼in. at the widest part. Cut a ¼in. hole in the crank to fit the spindle and an ⅛in. hole for the small length of rod to act as a handle as shown.

When gluing on the crank to the spindle allow a ⅛in. clearance so that all will work freely when the winding cord and weight is attached. Make the pawl (Q) from ⅛in. wood to the pattern shown in Fig. 1. It is 1¼ins. long, and a piece of wood ⅜in. wide should be sufficient to get the correct shape shown. Test the pawl for position by placing it on the face of (G) and engaging the ratchet wheel, just as seen in Fig. 1. Then insert the screw after making the hole and screw it down, not tightly, of course, as it should rise and fall evenly and smoothly as the teeth of the ratchet wheel rise and fall. The whole crane and jib must finally be put over the main upright spindle, and come to rest on platform (F), where a thin metal or ivorine washer could be inserted or dropped over the spindle beforehand.

The sheaf or pulley block (R) consists of two pieces of ⅛in. wood with a pulley wheel sandwiched between them. The pulley works freely round its axle, each end of which must be glued into the sides. A wire pin run through the sides of the block will have a wire hook attached to it for lifting purposes. The three pulleys required are ⅜in. in diameter and cut from ¼in. wood. The groove round the edges can be formed with a rat-tailed file, making good deep grooves in which the cord will run. The woodwork may be either painted or varnished at completion. (143)

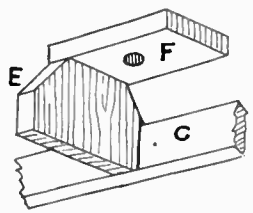


Fig. 3

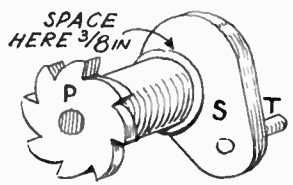


Fig. 4

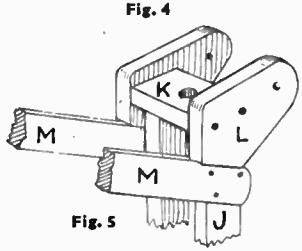
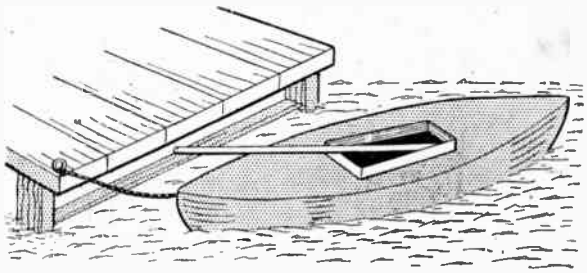


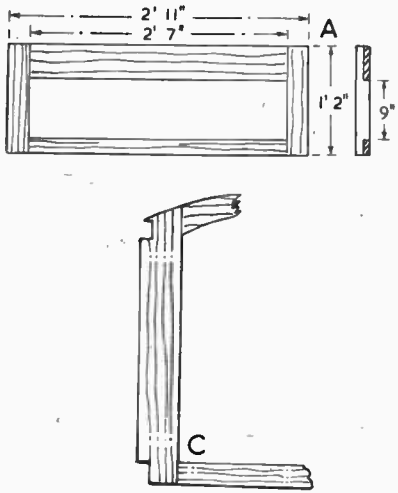
Fig. 5

How to make your own DUCK PUNT



MOST fellows who live within easy reach of a river or stream feel, sooner or later, that they would like to try their hand at boat-building. For craft of simple design this is not such a difficult task as might be thought. Given normal woodworking skill, a space sufficiently large in which to work, and a good fund of patience, elementary boat-building can be learned by anybody.

The duck punt described below makes an ideal introduction to the craft. The design has been simplified as much as possible without sacrificing the principles of sound construction, the punt is of useful size, and its cost is reasonably cheap. Although primarily designed for the duck shooter the punt is suitable for all the normal purposes to which such a boat can be put.



These drawings will help the constructor

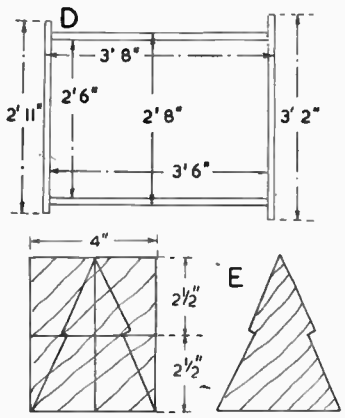
The work is commenced by building the two main bulkheads.

These differ slightly in length, one being 2ft. 11ins. and the other 3ft. 2ins. long, but in all other respects they are identical. Wood of 1in. thickness is used for their construction throughout, the top rail being 3½ins. wide, the bottom rail 1½ins. and the uprights 2ins. wide. Any suitable softwood may be used, though red deal is probably the best.

Ordinary halved joints are used at the corners of the frames, the members being glued and screwed together. Waterproof glue should be used for the assembly and note must be taken of the position of the notches that must be cut, so as to avoid putting screws in the parts that will be sawn out. Drawing (A) shows the essential measurements of the shorter of the two frameworks.

The top rail of each framework is then shaped round so that the outside edge of the framework is reduced to a height of 1ft., the inside edge of the rail being similarly treated (drawing B). The shaping can be done with a compass, saw and spokeshave.

Before laying these bulkheads to one side, four notches must be cut in each,



the notches measuring 1in. long by ¾in. wide. The lower notches are level with the bottom edges of the bulkhead, while the top edges of the top notch comes just below the edge of the top rail, as shown at (C).

The Cockpit

The next step is to make the cockpit opening by connecting the two bulkheads with two 3ft. 6½ins. long strips of 1in. by 1in. These are notched for ¼in. at each end and glued and screwed into place with 2ft. 6ins. between their inside edges, being central as regards the length of the frames. A view in plan at this stage of the assembly is given at (D).

A good quality hardwood (preferably oak) must be used for the bow and stern posts. Both of these are cut from wood of 4ins. by 5ins. section, are identical in shape, and are cut to an overall length of 10¼ins.

To mark the shaping on the end grain, the two centre lines are marked, and points are marked in at 1⅛ins. from each end on the shortest line; these points are connected to the extreme bottom corners. At right-angles to the sloping lines just made, and on the centre line, ¼in. long verticals are drawn, and lines are then made from the tops of these to the centre top edge. This marking-out is made plain by drawing (E).

Straightforward

The working of these posts is quite straightforward. The main part of the waste wood can be taken out with a finely set saw and the cut surfaces smoothed with a plane. A certain amount of judgment is necessary here, as the shaping should not be done right down to the lines. The side planks which are to be added later will not bed down correctly if the long edges at each side of the shaping are perfectly straight. It is advisable, therefore, to allow a good ⅛in. spare that can be taken off to the correct shape with a chisel when the sides are being fitted. A view of the completed post in plan is also given at (E).

Each side of the punt is made up from a ½in. thick board 1ft. wide and 14ft. 3ins. long. Again, hardwood is preferable if obtainable, and if possible two boards of the full width are desirable. Jointing to obtain the width may cause difficulty in making the craft watertight if the work is poorly done, but with the help of an assistant it should be possible to shoot the two edges sufficiently well to make a 'glued screw' joint, using waterproof glue for the assembly.

Having obtained the two boards, each is rounded off along the bottom edge so that while they retain their full width of 1ft. at the centre, they taper away gradually to a width of 10ins. at each end.

(*Continued foot of page* 100)

Model Railway Matters

PUT VARIETY INTO YOUR BUILDINGS

I HAVE recently been acting as judge at various local model exhibitions, and I would like to see more variety in the style of the actual buildings. It is an amazing thing that, in real practice, one seldom sees two stations alike. In Essex I know one station built with turrets and mullioned windows to keep it in style with the local Lord of the Manor's house.

In Cornwall, Devon and Somerset we see quite a few wooden stations and these are easily made in cardboard and scored in with a blunt knife. They are mostly painted cream and a favourite trimming colour is chocolate. Tiled roof is mostly in flat grey shade.

Another familiar type is the one built in weathered brown brick similar to the paper made by 'Modelcraft'. This can be used effectively with corner stones and doors, with windows made in thick photographic mounts and pasted on. Paint these in a dull grey with streakings of fawn or brown.

Various Chimneys

Chimney stacks on stations seem to suggest many diversions. Study of pictures of some of these will show short stubby ones, similar to the house type, whilst on more lofty stations we see tall ornamental styles. In other photographs the chimneys are built in block fashion without the round pipe sections.

Variety can also be given to the small country station by the addition of the station-master's house which is part and parcel of the station property. This mostly means that you have a fairly lofty house and a narrow station adjoining. This type of model is best built in two sections for ease of packing and setting up.

Another interesting version and quite different can be seen quite a bit in Devon where some of the station buildings are detached from the main buildings and connected only with a covered way. In some cases, small coaches and taxis come into this section.

Many stations in Devon and Somerset are still of the solid Guard's barracks type in dull cream, and make easy building as they are very square and recesses and cornice effects can be built up in cardboard sections. Most of these types have overhanging coverage on to the road, sometimes with pillars and at other times on brackets.

In Kent, Surrey and Sussex we get variety in plenty. Some of the stations are really ornate, and complete with central clock tower as at Bognor Regis. Buildings are mostly in red brick, and windows are very deep and spacious. In the case of Boxhill we have tall and lofty gables with, obviously, living room for the stationmaster.

A picture taken of Broadstairs station in 1924 shows it to be fairly small and with a castellated water tower, round in shape with a battlement top to it.

Canterbury East at one time had an overall roof which would make a fine piece of modelling because most of these overall roofs have been removed now and only remain as memories. However, such a feature would always arouse keen interest.

We can also find plenty of variety in the footbridges of our stations. Still with us are plenty of the lattice type in iron and these are interesting to make in thick cardboard and a handy job for the winter evenings. Some are covered with the canopy boarding so common only to railway outbuildings. Then we have the straight type with base and two straight sides, on top of which is a rounded roof on struts. Another version is seen with solid base and sliding windows along the top section.

Styles in Canopies

Station canopies take on all sorts of styles, and here again, one can build up his own style. We see types with heavy glazed sections set up in panels, the ordinary up and down pointed style and also a deep rounded type. Most familiar, perhaps, is the style which is fitted to the actual station building and has a gradual slope to the line. In some cases it may slope back from the line. Not all are glazed, and many are covered with metal or zinc. These can be made by using cardboard and fitting thin strips of wood at intervals of ¼in. Paint in flat slate grey.

Yes, we have variety in stations and what about a few of those interesting little gardens we see in our travels? Why not a few shrubs—and we have seen tropical trees near the platform in Cornwall. Some wide platforms even have circular rockeries. If you are after a prize for the most original model, then try out a station and think up something the other chap forgot. Remember, the filming of 'The Ghost Train' was done at Camerton, a queer little station on the Stoke and Hallatrow branch (near Bath) which was closed to passengers on September 21st, 1925. (118)

Making a Duck Punt—(*Continued from page 99*)

The main carcase of the punt is then ready for assembly.

A thick coating of red lead is put into the back recess of the bow post, a side plank is put into place (with top edges of post and plank flush) and is secured in place by 1½ins. brass screws; at least three screws should be used to fix each end. The second side is fitted into the same post in exactly the same way.

The two bulkheads are then laid between the sides at 5ft. 5ins. from the extreme front of the post, the longer bulkhead being to the front. With the bulkheads temporarily held in this position each side plank in turn is bent round the outside of the bulkheads and screwed into the rebate of the stern post, after the latter has been generously treated with red lead.

When all screws into the posts have been driven well home, and the framing is considered secure, the bulkheads should be tested to ensure that they are at right-angles and that their top edges are flush with the top of the sides, and they, too, are screwed into place.

A plan of the punt and the remainder of the assembly instructions will be given in the second part of this article. (416)

(To be concluded)

Make these Toy

MECHANICAL SWINGING BOATS

The toy Swinging Boats illustrated are the subject of this week's free Design (No. 2924), and would make an ideal Christmas gift for a small child. For making the toy, the necessary materials are obtainable from Hobbies Branches or Hobbies Ltd., Dereham, Norfolk, price 6/5, including purchase tax and post free.

Practical instructions for
BINDING YOUR 'HOBBIES'

AS it is now possible to get binding covers, at least a limited number of them, it is a good plan to bind your copies of *Hobbies* in neat volumes. Some hints on simple bookbinding have appeared in these pages before, so the subject will, this time, be dealt with briefly, and a description of the necessary appliances for the job more fully given. These appliances are really essential if good work is to result, and will be handy not only to do one's own binding, but also others, as the craft is a paying business and a pleasant one as well.

The Press

At Fig. 1 is given a drawing of a press, perhaps the most important appliance of the lot. You simply cannot do the work without it. Cut the cheeks of stout timber, say 1½ins. thick, or more. At 2ins. from each end, on a centre line, bore ⅜in. holes through, and be sure to get these holes in true alignment in both cheeks. At top (A) screw a strip of wood along, ½in. thick and ½in. wide. Now fit the cheeks of the press with iron bolts at least 6ins. long. A washer goes under each nut, which should be of the wing pattern for easy and quick tightening. A pair of shorter bolts might be included

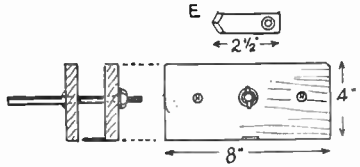


Fig. 3

when the book to be pressed is too thin for the press to close on.

With the press provide a pair of pressing boards about 9ins. wide and 13ins. long, cut from wood ½in. thick. One edge of each of these should be bevelled off as in detail (B) for helping to form the joint when backing the book.

At Fig. 2 is shown the sewing frame, with a section, ready for sewing, in position. Make this about 15ins. long and 8ins. wide from plywood, to which thickening strips are glued underneath at back and front. The posts can be ⅞in square and 7ins. high; they are jointed to the baseboard as at (C) and a strip of wood is nailed across the top. Quite a simple affair. At Fig. 3 is given a design for a simple form of bookbinder's plough for trimming the edges of the volume. The sides of this are cut from ½in. hardwood. Fasten both together and drill ⅜in. holes at 1½ins. from each end and in the centre, as shown in the drawing. In the end holes in one side glue 7in. lengths of ⅜in. dowel rod, to act as guides in bringing the sides close during cutting operations.

In the centre fit a 5in. bolt with washer and wing nut. A piece of steel will be required for the knife, of stout substance and about 1in. wide. The cutting end of this is ground to the shape shown at (E) and a hole drilled for fixing the knife to one of the sides, in the position seen in the end view of the plough. The hole should be well countersunk on its underside, and is fixed with a single screw to the side in a recess cut to sink it in level, exactly in the centre of the length.

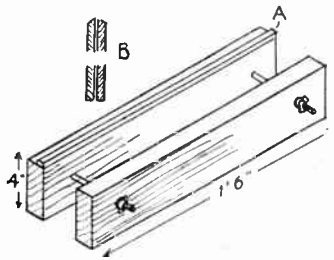


Fig. 1

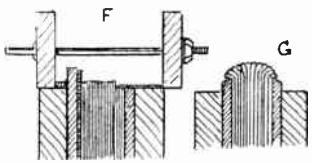


Fig. 4

With the above appliances, and such tools as are to be found in any household, work can now commence. Remove the covers and staples from the books, and place in numerical order. Cut two sheets of paper, white or coloured, to double the size of a single sheet of the book. Down the centre of each paste a ½in. wide strip of thin linen, then double the sheets, with the linen inside. These are the end papers, and should be placed top and bottom of the pile of books.

The whole should then be placed in the press, with a pressing board either side, and a thick pencil line drawn across the back of the books at ⅜in. from each end. Remove, and place against the sewing frame. The books should be sewn on tapes, so three ½in. wide tapes are fixed between frame bottom and top strip, as at Fig. 2. Arrange these to suit the size of books operated on, the end tapes about ½in. inside the pencil marks.

Thread a stout needle with a long length of sewing thread first. Lift the top end sheet, open out on the frame and pass the needle through the centre line on the right hand pencil mark. Now push it out and round the tape, and inside again, as shown by the dotted lines, letting the needle emerge at last through the last pencil mark. Open out the first book at its centre, turn upside down and lay on the frame, above the end sheet. Sew this similarly and then tie the thread to the loose end at the beginning of sewing.

Continue with the second book, and when done pass the needle between the

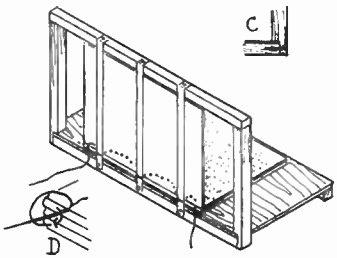


Fig. 2

two last sewn, behind the thread connecting them together, then pass the needle through the loop thus made, and draw tight. This is known as the 'kettle' stitch, and is made at the end of every book sewn down to the final one. The detail (D) will help you to grasp this, it is really simple. When all the books and final end sheet are sewn together, cut the tapes, leaving 1in. ends each side for pasting to the covers.

Trimming

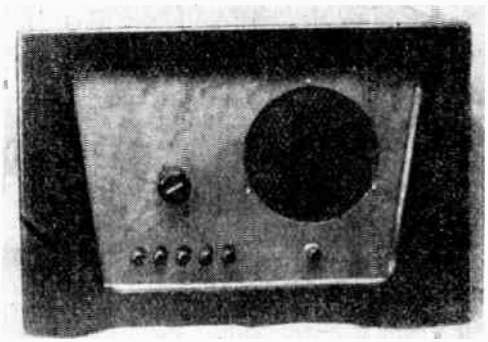
The edges should not be trimmed with the plough. Mark in pencil the amount to to cut off, which should be measured from one of the binding covers, less the back of course. The dimensions of the finished volume should be the same in width as that of the cover, and ⅛in. or $\frac{3}{16}$in. less in length at top and bottom, that being about the usual amount of overlap, according to the size of the book. Sandwich the book between the pressing boards, with a sheet of cardboard on the under board to prevent the knife cutting into the wood.

Set the top board level with the pencil lines on the end sheet, place in the press, and move carefully until the edge of the

(*Continued foot of page* 103)

For the radio-enthusiast—

A PUSH-BUTTON TWO VALVER



A NUMBER of modern receivers employ push-button tuning. With this type of tuning, no difficulty arises in adjusting the set for the required station, as it is only necessary to depress the appropriate button, when the programme is brought up immediately, correctly tuned. Various circuits for such receivers exist, and some are very complicated. That described here, however, is designed round a 2-valve battery-operated circuit. This, naturally, limits the range to some extent, but ample volume is obtainable from those stations which are most powerfully received. The set should be particularly appreciated by elderly people, while other users will probably find that they actually spend most time listening to local programmes, in any case.

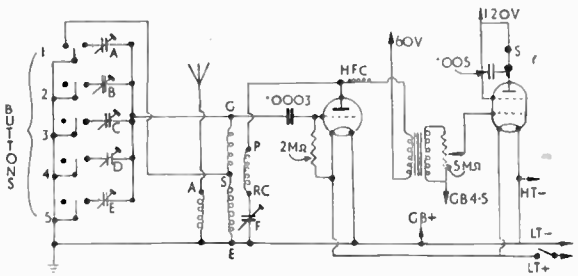


Fig. 1—The circuit of the set

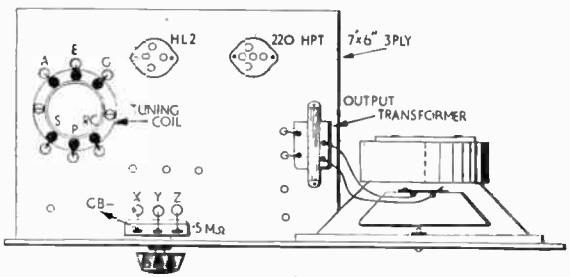


Fig. 2—Top wiring plan

How it Works

The manner in which the set operates will become apparent after an examination of Fig. 1. The push-button switch is shown at the left, and has five buttons. Each of these operates a change-over switch. Each is spring-loaded, so that when any button is pressed in, that which was previously depressed springs out. An automatic catch arrangement holds each button in until another button is depressed.

When button 1 is depressed, condenser (A) is connected to the tuning coil and the latter set for Long Waves. Condenser (A), as with condensers (B) to (F), is a pre-set type, which can be adjusted with a screwdriver. It is adjusted so that the Light Programme (Long Wave transmitter) is accurately tuned in. This means that this station will always be received, correctly tuned, when button 1 is depressed.

Buttons 2 to 5 connect condensers (B) to (E), each of which is similarly set for a desired station. Button 1 springs out when any of these buttons is depressed, thereby switching the coil to Medium Waves. Buttons 2 to 5, therefore, enable four Medium Wave stations to be selected. In the set actually built, the following stations were selected: Midland Regional, London, 3rd Programme, and Allied Forces Network. The stations actually chosen will, however, depend upon the part of the country in which the set is used, as will be explained.

The remainder of the circuit follows normal lines, volume control on all stations being provided by the ·5 megohm potentiometer.

Components Required

None of the parts are critical, but they should naturally be in proper order. A HL2 valve can be used for detector, with 220HPT for output — or any *equivalent* types will be suitable. Ordinary paxolin valveholders are used. One 4-pin holder and one 5-pin holder are required.

The ·0003 and ·0005 mfd. condensers can be of mica or paper type. The 2 megohm resistor is the usual grid leak. The ·5 megohm volume control is of the usual carbon-track type, with knob.

Valve Coupling

For coupling between the valves, a standard L.F. coupling transformer is used. Many types exist. It should, however, be noted that some very old transformers do not provide the volume or quality of reproduction obtained from a modern transformer of good type. Any small Long and Medium Wave H.F. choke can be used, and a simple on/off switch. The speaker should be a permanent magnet moving coil speaker with transformer for battery-operated pentode valve. Many sizes are available, a 6 or 7 in. speaker being average.

Exact winding details for suitable coils have been given in numerous past issues, and will not be repeated. Alternatively, a dual-wave ready made coil may be used. The type with reaction winding should be obtained.

Button-Switch and Condensers

Many types of push-button switches are made, with up to twelve or more buttons. Here, however, so many buttons are not really required, a five button unit being ample.

A little thought is necessary in selecting the pre-set condensers, because these will not tune throughout the whole of the usual wavebands. Condenser (F) is for reaction, and can be ·0003 mfd. Condenser (A), for Long Waves, can be ·0003 or ·0005. (With either of these, the 1500 M. transmitter may be tuned in.)

Condensers (B), (C), (D) and (E) should be selected with a broad idea of the station to which each is to be tuned. A ·0001 condenser will tune from about 200 to 300 metres. A ·0003 mfd. condenser will tune from about 250 to 400 metres. To tune above this (e.g. for the high-wavelength 3rd programme) a ·0005 condenser will be needed.

Difficulty will only arise, if this is

overlooked, when trying to reach stations at the extreme ends of the waveband. For example, ·0003 mfd. condensers would do for all stations situate round the middle section of the waveband. But for 400 metres and upwards ·0005 condensers are necessary. Except in special cases, (B) can be ·0001, (C) and (D) each ·0003, and (E) ·0005.

Wiring Up

All wiring is shown in Figs 2 and 3, and no difficulty should arise here. Lengths of flex are used for battery connections, the batteries being placed inside the cabinet, near the speaker. If the accumulator is large, however, it should be situated outside, and longer leads may be left to take to it.

Panel and chassis are made from 3-ply, except for the side runners of the latter, which are best of somewhat thicker wood, to facilitate the pieces being screwed or nailed together. The panel is 8ins. by 12½ins. and the speaker is bolted directly to it.

Insulated wire is used throughout, with neat soldered joints where necessary. If the coupling transformer is more than 1½ins. high, then it will have to be placed on the top of the chassis, with leads going down through small holes to the parts below. Keep this transformer at some distance from the output transformer.

All the pre-sets are mounted with spacing bushes below the chassis, as shown in detail (A), Fig. 3. This enables them to be adjusted with a small screwdriver from above. If they are fixed with the adjusting screws downwards, it will be necessary to turn the set on its side, or upside down, when making initial adjustments.

The Cabinet

This is very straightforward, being made from ⅜in. thick wood to the dimensions given in Fig. 4, which is a front view. When the receiver is completed and adjusted, it is pushed in from the back. The panel then comes behind the cut-out in the cabinet front, and is attached by small screws driven in from behind.

The cabinet should be nicely finished off, varnished or polished according to taste, and mounted on strips or feet. It is 7ins. deep. A back may be made to exclude dust. This should have a number of holes, to permit sound waves to pass out, thus avoiding cabinet resonance.

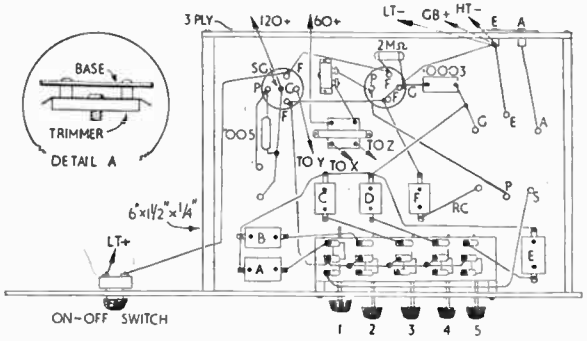


Fig. 3—Underneath wiring plan

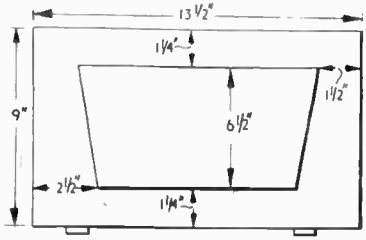


Fig. 4—Dimensions of the cabinet

Adjusting Notes

When the set is completely wired up, and valves have been inserted and batteries connected, it is necessary to adjust the pre-set condensers to the desired stations. Once this has been done, no further adjustment is required, unless the aerial or earth system is changed, when slight re-adjustment is necessary for best results under the new conditions.

To adjust, push in button 1 and turn the screw on condenser A until the Light Programme (Long Waves) is heard at maximum strength. As this is done, reduce volume by means of the volume control, if necessary. It is best to use an *insulated* screwdriver.

When this adjustment is completed, depress button 2 and adjust condenser (B) for the required station. Afterwards proceed in the same way with the remaining buttons. Condenser (F) may be screwed down a little to increase reaction, if necessary, but should not be set at such a capacity that any oscillation arises.

Medium Waves Better?

It should not be overlooked that in a few parts of the country the Light Programme may be best received on Medium Waves. If so, it can be provided with one of the Medium Wave buttons (2 to 5). Long Waves have been provided, however, because this transmitter gives the best signal in most parts of the country.

Experimental Reaction

Very similar results will be obtained if the pre-set (F) is omitted, and also the ·5 megohm volume control. A ·0003 mfd. reaction condenser is now mounted in the position originally occupied by the volume control, and wired up in place of pre-set (F). Volume is then controlled by varying reaction with this condenser. The only disadvantage of this system is that oscillation *can* arise, when the volume control is operated, which is not so with the circuit given. The system is, however, one the experimenter may care to try. (136)

Binding Your 'Hobbies'—(*Continued from page* 101)

top board is level with the press. Place the plough over in the position shown in Fig. 4 (F) and move it forwards and back, tightening the bolt a little each time, until the edge of the volume is cut through. To get a square edge it is necessary to adjust the knife exactly at right angles to the side of the plough, and to keep it sharp. If the nut comes to the end of the screwed portion of the bolt before the cut is complete, turn it backwards, knock the bolt in, and between its head and side of the plough insert a piece of wood with a slat cut in it to slip over the bolt. This will allow of enough further movement usually to complete the cutting. It is usual to cut the top and bottom edges first, and to finish with fore edge.

To 'back' the volume, place it in the press, with the bevelled edges of the pressing boards about ⅛in. down from the back edge. It should have this back edge sticking out, as at (G) then the back is gently hammered and the side edges beaten down over the edges of the boards to make the joint. Glue the back well, cover with a strip of brown paper, and leave for a few hours. The volume can then be pasted between the boards of the binding cover, and pressed tight for a few hours when a presentable bound volume should result. (496)

A keen angler tells you how to

KNOW THE FISH YOU CATCH

SOMETIMES the young angler finds a difficulty in identifying the fish that he may catch. Some fishes so closely resemble each other, particularly in their early stages of growth, as to puzzle the uninitiated about their exact species. In this connection, we may mention several familiar fish caught by the beginner fishing in pond or stream.

For instance, we have the chub and the dace; the roach and rudd; perch and ruffe, and others. Some fish are so very distinctive that even the veriest tyro has no trouble in telling one from the other, and probably naming them correctly.

However, it is not always so easy. And there are times when even an old hand may slip up. Let us take, for a start, the chub and the dace. These are frequently puzzling and may confuse the tyro. Yet there are distinctions by which we may identify them, if we take a little trouble over the matter. Though much alike, there are differences we may easily memorise. Lay a chub and a dace side by side, and you will see that the former has a bigger, blunter, and 'chubby' head. Then the sides of the chub, though silvery like the dace, assume deeper greenish tints and brassy hues in larger specimens. But the surest point of identification lies in the fins. In the dace the fins are greenish, and the anal fin is of a different shape to the anal fin of the chub, being *concave*. In the chub it is *convex*.

Points to remember: The dace is a more elegant fish than the chub. The back of the dace is dark olive but changes to silver on the sides much sooner than in the chub; the colour of the fins is greenish, though the ventral fins have a faint rosy tinge. In the chub the ventral fin is bright red and the anal fin is also reddish. The shape of the anal fins of these fish we have described above, but if you cannot remember the difference between concave (as in dace) and convex (as in chub), try and think of 'dented' dace and 'curved' chub.

Roach and Rudd

Both are handsome fish and the roach is one of the most popular and most widely distributed in English rivers and still waters.

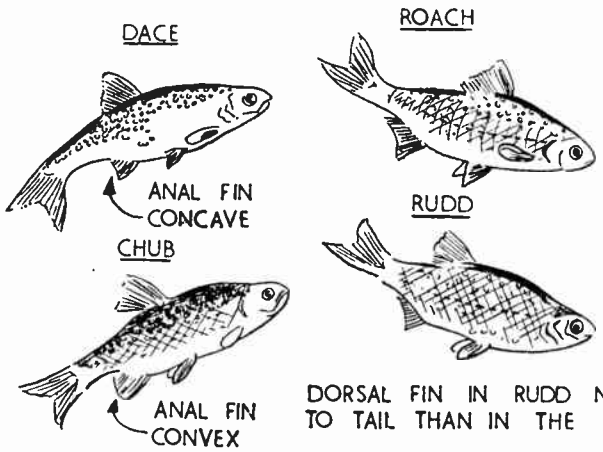
These two are often much alike in appearance. Let the beginner study their looks and other differences, however slight they may be at times. Main points lie in colour and shape.

The rudd is deeper in the body than the roach, its sides reflecting golden tints, mingling and blending with silvery hues, the degree of gold varying in different waters. The fins of the rudd are of a richer carmine than those of the roach.

Points to remember: Deeper body of the rudd; bright carmine of lower fins; and golden tints on the scales of sides of fish. One unfailing point—the dorsal fin of the rudd is placed nearer to the tail than in the roach. In the latter, the dorsal fin begins practically in a straight line with the ventral fins. In the rudd it is much farther back. The rudd has a projecting bottom lip; the roach has a projecting *upper* lip.

Perch and Ruffe

In general appearance the ruffe carries a strong resemblance to the perch, and the young beginner may confuse the two.



The ruffe has the same sort of hog-shaped back, the same spinous fin, and is similar in shape, and like the perch is gregarious in habits. At first glance the young angler may think that the ruffe he has just landed is a perch.

But, if he looks at it again, he will note that it has none of the brilliancy of the perch, which has such bright red fins and striped body with shining armour of green and brown with golden glints, merging into a silver-white belly. A perch, when first drawn from the water, is indeed 'lovely to behold'. The ruffe resembles a gudgeon in colour, being of an olive brown mottled and marbled with darker hues, with a hint of brassiness on its flanks. There are dark spots on the dorsal fin and tail.

Points to remember: The ruffe is a smaller fish than the perch, and is of a sober colour. It is somewhat slimy to handle, being a fish that secretes mucus. Note the difference in upper fins. The perch has two dorsal fins, one spiny, the other soft. In the ruffe the dorsal fin is united, the forward part being spiny, the after part being composed of soft rays, about twelve in number.

In the ruffe the posterior gill-cover ends in a single sharp spine, which is protected by a flap of skin.

Carp

Remember that the common carp has four barbels, two hanging from the upper jaw, and two longer ones at the corners of the mouth. Its scales are big. Its eyes have golden irides. The dorsal fin is concave on its outer edge; the tail is markedly forked. Body colour varies in different waters. It may be bluish-brown or brownish-olive, with brassy tints on its sides. The anal fin is red-dish-brown and orange; the other fins are purplish-black. This fish attains a large size.

The crucian carp (or prussian carp), has no barbels at the mouth. Edge of dorsal fin is convex, not concave as in the common species. Tail is but slightly forked. Much smaller in size than the common carp.

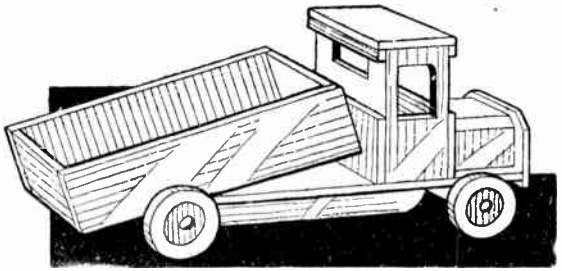
The leather carp is scaleless; and another kind found in English waters, the mirror carp, has two rows of much enlarged scales on each side of the body.

Bream

In the bronze bream, the lower fork of tail is quite noticeably longer than the upper fork; in the silver bream the lower fork of tail is only slightly longer than the top one. If you care to count the scales along the lateral line the silver bream has 44 to 50 scales, whilst the common or bronze bream has 49 to 57 scales.

Roach-bream Hybrids:—Roach have 12 to 14 rays in the anal fin; in the bream there are 26 to 31—in the cross-bred fish or hybrid roach-bream the rays in the anal fin number somewhere in between these two sets of figures, varying in individual fish. (113)

Little boys will want this
TOY TIP-LORRY



A MODEL lorry is always a popular toy, and is welcomed even more strongly when it is of the 'tip-up' variety. The model described below is of simple but sturdy construction and can be made up quite cheaply from oddments of wood.

The main base is the first item to be made, this measuring 11ins. long, 4¾ins. wide and ¼in. thick. This is cut to the shape shown at drawing (A), which gives the main dimensions of the outline; it will be seen that the shaping (which may be cut with a fretsaw) is confirmed to the last 3ins. of the base, the radiator piece being 2½ins. wide.

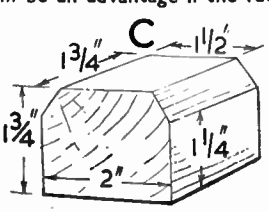
A back axle is then fixed to the underside of the base, this axle being 1in. wide, ¼in. thick and 4¾ins. long. It is glued and pinned into place on edge so that its outside face is at 1in. from the back edge of the base.

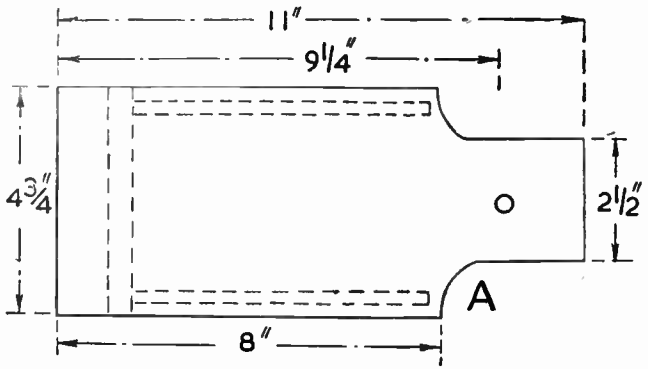
Two side pieces fit beneath the base, their ends butting against the inside edge of the back axle. Each strip is 6¼ins. long, ⅝in. wide and ¼in. thick, the front edge being taken off to a quarter-round shaping. The strips are so arranged that they are set back ¼in. from the long sides of the base. The position of these strips (and of the back axle) is shown in dotted lines on drawing (A) and in side view at (B).

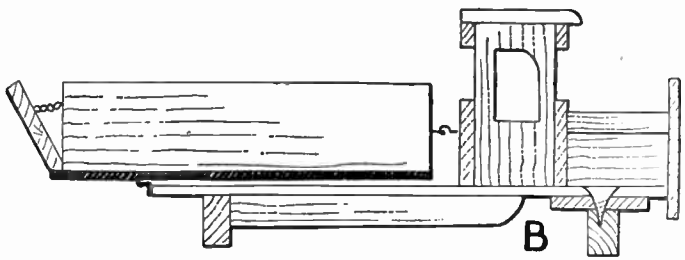
Moving Axle

The front axle must be movable so that the lorry can be steered. Although of the same end section as the back axle the front one is only 2½ins. long, and a circle of ¼in. thick wood, 2ins. in diameter, is glued to its top edge. In the centre of the radiator shaping a small hole is drilled in the position as shown at (A). A screw is fitted down through this hole and into the circular disc on the front axle, which should revolve on the screw quite freely (see B).

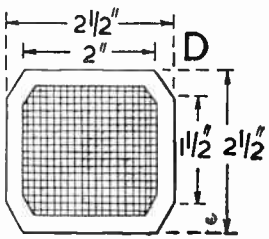
It will be an advantage if the radiator is of solid construction, though it can be built up in box form. The shaping can be followed from drawing (C), the block being 1¾ins. long 2ins. wide and 1¾ins. high, with a ⅛in. deep and ¼in. wide chamfer worked along each top edge. When completed it is glued into place on the lorry base, flush with the front edge.







A square of ¼in. thick wood, with sides 2½ins. long, is taken and is cut to the outline as shown at (D). A margin is made at ¼in. inside the outline, and if desired the area inside this margin can be ruled across with small squares which can be cut into the wood with the point of a chisel to imitate a radiator grille. This panel is glued and pinned to the front of the radiator so that its top edge is ¼in. above the solid radiator block.



The driving cab is the next item to be made and fixed.

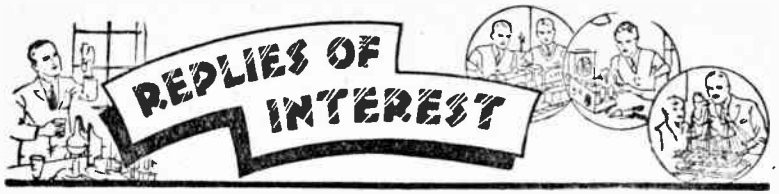
Wood of ¼in. thickness is used throughout for this, the back and front being 4¾ins. long and the sides 2ins. long, all 3½ins. high. An opening 3¾ins. long by 1¼ins. high (with its top edge at ½in. from the top edge of the wood) is cut in the front panel, and a similar opening, but only 2ins. long, is cut in the back panel.

The two sides fit between these panels, and again these have an opening cut in them, these openings being 1½ins. wide and 1¾ins. high, with the top front corner rounded off as shown at (B).

After the four sides of the driving cab have been glued and pinned together, a length of 1in. square material is fastened between the short sides to serve as the driving seat, and the whole is glued and pinned to the lorry base. The top of the driving cab is 5¼ins. long by 2¾ins. wide, and is slightly rounded off on the front and short edges. It is glued and pinned into place so that it overhangs the front and sides of the cab by an equal amount.

The sides of the tipping body are of

(*Continued foot of page* 106)



Radio Interference

I RECENTLY wired up a Wolf-Cub lathe in a shed a few yards from the house, but find on running it that the radio crackles terribly. Could you advise me how to check this interference set up from the motor? (B.W.—Preston).

IF the interference is being introduced into the set from the aerial (if any) of the latter, this may be cured by removing the aerial to another site, or by running the supply leads to the motor in such a position that they do not interfere with the aerial. If the interference ceases when the aerial is removed from the set, this shows it is being picked up in this way. If the interference is being carried on the mains, it will need to be suppressed at the motor and this may in some cases be achieved by wiring condensers (500 V. working) from each mains-supply plug point to the third, earthing socket. In bad cases further condensers from the brushes of the motor may be required. It may also prove helpful to earth the metal frame of the motor, if this has not been done. Readymade suppressor units may be purchased to plug into the supply socket, either at the motor or receiver point. Condensers used should be about ·1 mfd. This is a subject upon which the G.P.O. will give free advice, and they can normally try various suppressors on the spot to determine which is best, at no charge.

* * *

Choice of Wood

WOULD you tell me the best and easiest worked wood to use when making a coffee table, and could you give me information on the process of beeswax polishing as a finish? (R.W.—Wolverhampton).

IF you are proposing to shape up the legs of your coffee table, there is not much to choose between any of the popular hardwoods such as oak and mahogany. For carving, the wood must not be too soft—you could employ American whitewood as being the easiest to work, but the harder, close grained woods as above are certainly better. For your purpose, therefore, we recommend the first named, and if difficult to obtain, birch is a good substitute and almost universally used. It is not difficult to shape at all if the tools are kept sharp, and stains and polishes well. Wax finish is mostly a matter of elbow grease and gives good results after a time. You should purchase a proprietory brand of wax, Johnson's for example, and apply it to the wood with a clean rag, followed by a rubbing with a soft one. A hard glaze results in time, given several applications and plenty of friction.

* * *

Trouble with Stain

I MADE a small wardrobe of tea chests and for the front and door used ¼in. hardboard, filling in the nail holes, etc., with plastic wood (natural shade). But on staining it with light oak varnish stain I find the plastic wood shows up very clearly and spoils the otherwise nice finish. Can you tell me how to darken the plastic wood spots and still keep the light oak finish? I have already applied three coats of stain and still the spots show clearly. (W.N.—Dungannon).

IT is a mistake to use a combined stain and varnish where hardboard is employed in conjunction with wood, as the stain penetrates more deeply and matching is impossible. We consider the best proceeding now would be to glasspaper the present surface until all gloss is removed, then to carefully scrape with a penknife the spots of plastic wood, and apply with a small brush the stain to those parts only until they match the rest. Then give a coat of clear oak varnish to the whole. An oak powder stain would be better than the combined stain and varnish. This treatment may not render the spots invisible, but should at least make them less conspicuous. An alternative treatment would be to glasspaper as above, dig out the existing stopping with a bradawl and replace with oak coloured plastic wood sold in tubes, and varnish over all.

Toy Tip-Lorry—(*Continued from page* 105)

2ins. by ¼in. section. Three pieces of this are glued and pinned together to make a framework with overall dimensions of 8ins. long by 4¾ins. wide, and on this a three-ply bottom is fitted, the plywood extending ¼in. beyond the narrow open end of the box. A fourth piece of 2ins. by ¼in. wood is fitted into the opening as a tail-board, its bottom edge being hinged to the plywood. It will be necessary to fit a couple of small catches to the tail-board so that it can be kept closed.

Square Hinges

On the end-grain of the lorry base two small brass hinges are fitted, the other flaps of these being on the underside of the tipping body, the latter being so placed that there is a distance of ½in. between its back edge and the back of the driving cab (see B). A hook to engage in a staple will keep the body down, and can be disengaged for tipping.

The two pairs of wheels can be of ⅜in. or ½in. thickness, but are of two sizes, the back wheels being 2ins. in diameter, and the front wheels 1½ins. diameter. They are simply fixed into place by screws through the axles.

Back Wheels First

The back wheels should be the first to be fitted, the screws being just sufficiently slack to allow the wheels to revolve freely. When they are in position the front wheels can be added by passing a nail through the wheel into the front axle to mark the exact position for the screw, first making certain that the base of the lorry is parallel to the table top.

Screw Fastening

A small screw eye can be fastened towards the bottom of the radiator capping piece enabling a length of string to be tied there, so that the lorry can be pulled along. The whole toy is thoroughly glasspapered, and is then painted in brightly coloured enamel. (480)

THE SCOUT MOVEMENT ON STAMPS

SINCE its introduction to Great Britain by Lord Baden-Powell in 1908, the scout movement has developed into a world-wide organisation and has held World Jamborees. With such a colossal membership, it is only natural to find scouting depicted philatelically by many countries, and also to find that many scouts are stamp collectors.

The Fourth World Jamboree held at Godollo, Hungary in 1933, was commemorated by a special Hungarian set of five stamps bearing for their design 'The Stag of Hungary'. The Fifth World Jamboree held at Vogelenzang, Holland in 1937 was the occasion for the issue by the Netherlands of three stamps. These depicted the Tenderfoot Badge, an allegory of the Scout movement and the swift-footed Greek God, Hermes. The Netherlands Indies also issued two stamps on this occasion and these featured Boy Scouts. France issued a 5f. commemorative in 1947 showing a reef knot and trefoil badge on the occasion of the Sixth World Jamboree. This year's Seventh World Jamboree at Bad Ischl, Austria, has been honoured by an Austrian 1s. stamp showing the Scout's badge.

Roumanian Issue

Jamborees other than World ones have been philatelically honoured. Roumania issued a special set of six values in 1932 for her National Jamboree. These stamps featured scouts in camp, on the trail, cooking by the camp fire, and semaphore signalling. This issue was overprinted for the Mamaia Jamboree in 1934 with the words 'MAMAIA 1934' and the Arms of Constanza. Roumania's 1936 Jamboree brought forth an issue of three stamps depicting the National Scout Badge, the Tenderfoot Badge and the Brasov Badge. Australia issued a 2½d. red in 1948 bearing a drawing of a Boy Scout to mark the Pan-Pacific Jamboree. Subject to the sanction of H.M. the King, Jamaica hopes to issue two stamps in March next year to commemorate the Caribbean Jamboree. Both values will incorporate the Scout Badge in their design.

Roumania was one of the most keen scouting countries before the war and used her postage stamps to raise money for the Scouts' Fund by placing a premium on them. The 1931 set of five was in aid of the Scouts' Exhibition Fund and illustrated a Scout's encampment, rescue work, recruiting, Prince Nicholas and King Charles II in scoutmaster's uniform. The 1938 set of eleven values was issued on the occasion of the 8th Anniversary of the Accession of King Charles II and depicted famous Roumanians, whilst the 1939 set of eleven, marking the 9th Anniversary, bore a drawing of St. George and the Dragon. Roumania also devoted several values of the 1935 5th Anniversary of the King's Accession set to the Scout movement. These stamps illustrate a scout saluting, a colour party, two scouts and a bugler.

Flying a Kite

A Boy Scout flying a kite is shown on the 6f. plus 6f. value of the 1940 Admiral Horthy Air Mail Fund issue of Hungary. The Hungary 1925 Sports Designs set contains scouts on the 1000k. Nicaragua selected scouts to illustrate the 2c. postage and the 2c. air of her 1949 Sports Issue. The first issue by Czecho-Slovakia after her foundation in 1918 was called the Scouts' Post because the distribution of the first revolutionary post was performed by the Scouts. The issue was of two stamps bearing a drawing of the lion rampant.

The Girl Guides have their own place on the stamps of Hungary. The 1939 Guides' Rally at Godollo was the occasion for an issue of four stamps illustrating the Guides' salute, the Lily symbol, a Guide with a girl in Hungarian National costume, and the Dove of Peace.

Soviet Organisations

The Soviet bloc of countries in Europe have their own youth organisations, those for younger children being called the Pioneers. The First All-Russian Gathering of the Pioneers in 1929 was marked by two stamps showing a trumpeter sounding the Assembly. In 1936 a set of six stamps was issued bearing Pioneer designs. Two showed Pioneers securing a letter box, two a Pioneer preventing another from throwing stones, one Pioneers freeing a kite from the telegraph wires, and one a girl Pioneer saluting. In 1948 Russia devoted a set of five stamps to illustrations of school children's summer holidays. These depict children flying model aeroplanes, a boy and girl saluting, children marching, a boy trumpeter, and children round the camp fire. In the same year, Russia commemorated the 30th Anniversary of Lenin's Young Communist League with six stamps bearing various pictures of young Communists.

Roumania has issued a set this year showing young Pioneers at a youth camp, meeting Stalin, and on parade for a decoration ceremony. Last year Roumania marked the First Anniversary of her Youth Organisation with three stamps depicting a trumpeter and a drummer, three children reading, and a youth parade. Hungary issued a set of five stamps on 14th August, 1949 to commemorate the World Youth Festival at Budapest, and in 1950 marked her Children's Day with a set of five, which include one stamp showing a Pioneer boy with a camp and another showing a Pioneer boy and girl and a model glider class. On 5th August this year Poland issued a 40zl. stamp showing young people dancing near the Brandenburg Gate in Berlin and commemorating the World Festival of Democratic Youth, about which there has been so much in the newspapers recently.

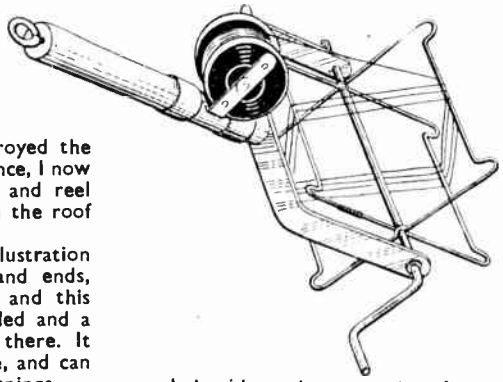
In Hitler's Germany

Germany under the Nazis had the Hitler Youth Organisation, whose so-called World Jamboree in 1935 was marked by the issue of two stamps bearing an illustration of a trumpeter. The 1943 German Youth Rally was the occasion for a stamp showing a boy and girl and the inevitable swastika and flag. Slovakia, controlled by Germany, issued a set of three stamps in 1942 in aid of the Hlinka Youth Fund. These featured a soldier with a Hlinka Youth.

The Greek Youth Organisation celebrated its Fourth Anniversary in 1940. Sets of ten postage and ten air stamps were issued for the occasion and the postage stamp illustrations included a boy member, a girl member, youths in column formation, a standard bearer and buglers, the Greek Youth Badge, three youths in uniform, and youths on parade. The airmails were devoted to views. The Second Meeting of the Union of World Youth in 1950 took place in Turkey, who issued two stamps in commemoration, showing a youth with Istanbul and Ankara in the background. Post-war Saar issued two stamps in 1949 in aid of the Youth Hostel Fund. These depicted hikers and Ludweiler Hostel and hikers and Weiskirchen Hostel. (130)

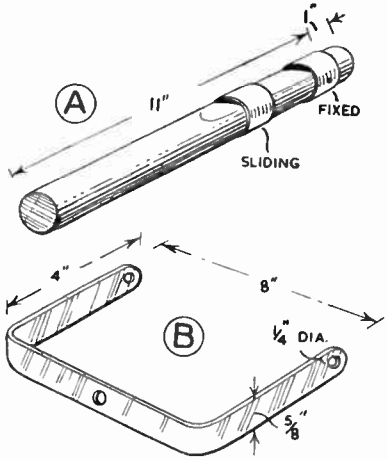
For the fisherman—making

A LINE DRIER



YOU will, no doubt, have tried several methods of line drying from time to time, and most probably have found, as I have, that few of them are at all satisfactory. I used to strip the line on to a newspaper and leave it to dry overnight, until some misguided person gave my young daughter a kitten. I came down one morning to find my line in a hopeless bird's nest, with the kitten pulling it all round the room!

The line can be wound round the back of a chair, but it is rather awkward to wind back on to the reel. Then again, it can be wound round a piece of wood or cardboard, but if the check is off, the reel



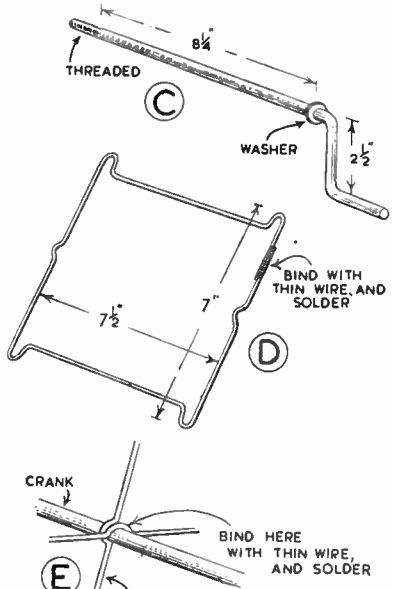
usually overruns, or if the check is on, it has to be held firm in some way. Of course, all these methods and many others are, undoubtedly, used every day, but the point is that they are not convenient. It is far better to go to a little trouble in the first place, and make yourself a simple line drier that will last a lifetime.

What could be easier than to clip on the reel and wind off the line on to the spreader? It can be done in two minutes. The whole thing can then be hung up out of the way of everybody, and safe from the attacks of mice, which will soon find and destroy a dressed or greased line. I found this out to my cost when I left an expensive pike line in an outside workshop. I had put it on the reel ready for a day's pike fishing, but I was doomed to disappointment because when I went for my tackle all that was left was a heap of short lengths about 4ins. long. A mouse had nibbled across the reel and completely destroyed the line. Having learnt by experience, I now hang up the drier, with line and reel still attached, on to a hook in the roof of the workshop.

The drier shown in the illustration was constructed from odds and ends, costing about 3/- altogether, and this was for having the holes drilled and a blob of solder put on here and there. It is quite a simple job to tackle, and can easily be made in a couple of evenings.

Making a Start

The sketch of the finished article will give a clear idea of the construction, and the other sketches are lettered so that you can follow the instructions step by step. You need, first of all, a piece of 1in. diameter round wooden rod about 12ins. long. To this are added a pair of winch fittings, which can be bought from your tackle shop, or made from two strips of thin metal soldered together. On the original article they were taken from an



old rod which was no longer serviceable. You will see in (A) that one ring is fixed and the other sliding, while the edge to take the reel has been flattened slightly.

The sketch at (B) shows the frame to hold the spreading arms. This frame is made of mild steel and to the dimensions given. The holes should be bored before bending to shape. The thickness of the metal should not be more than ⅛in. or you will experience difficulty in bending. To fix the frame to the handle, a long thin roundhead screw, about 2ins. long should be used. To prevent the handle splitting, start the screw off by boring a hole about 1½ins. deep first.

The handle shown in diagram (C) is made from 5/16in. diameter round metal rod to the measurements shown. Solder a washer on the shoulder of the cranked end, and put about ½in. of thread on the other end. An alternative to threading, is to bore a small hole through and use a split pin and washer.

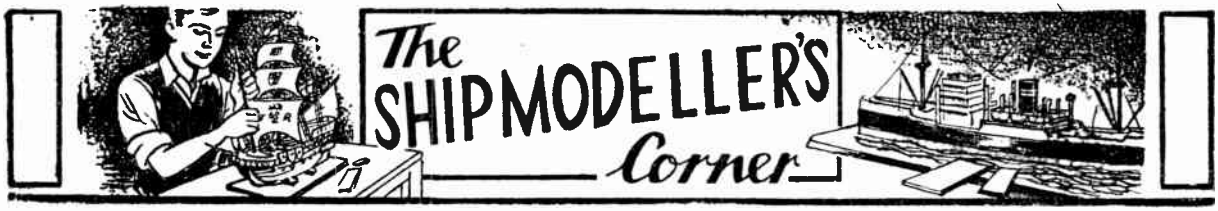
The sketch at (D) shows how the spreaders are made from wire. About 18 S.W.G. should be used, similar to the type found on orange boxes. Bend two of these to shape and bind with thin wire or solder together, or both.

Making Up

The drier is now ready for assembly, and this should be done as follows. First make sure that the frame is securely fixed to the wooden handle, and then thread the metal handle through the holes provided, putting a washer and nut on the threaded end. Next place the spreaders in position, as shown in (E), bind with thin wire, and run on each a good blob of solder. Keep the spreaders, crank and wire, scrupulously clean, otherwise the solder will not take. Screw into the end of the handle a ½in. screw eye, and the whole thing is now ready for painting. Give two coats of enamel, allowing the first coat to dry thoroughly before applying the second.

I find the best way to wind the line on is to put the reel in the position shown, and then hold the handle between the knees. The left hand is now free to distribute the line freely over the spreaders. To wind on to the reel again, simply turn the drier over so that the reel is underneath, and wind on in the normal way. Hang up the drier in a safe spot and give a little line-float as you wind the line back on to the reel. It is ready then for the next day's fishing.

(*Continued foot of page* 109)

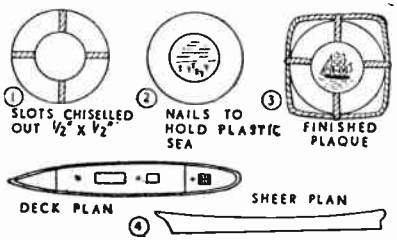


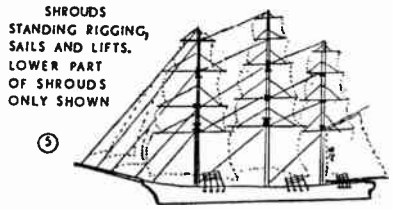
A Novel Ship Model Plaque

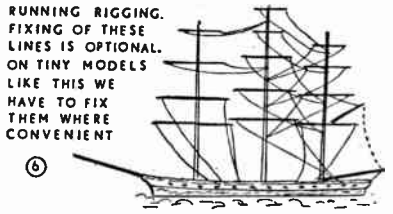
By 'Whipstaff'

FROM time to time in our series, we will leave our usual notes on ship modelling methods and historical data, to describe the making of miniature ships of unusual design or rig. In this article, although the ship itself will not be unusual, its presentation is definitely novel. It is in the form of a wall plaque, but instead of the usual embossed or cast ship, we have an actual miniature ship set in a modelled sea.

To commence, we must cut our







outer ring for the lifebelt frame; a close grained wood would be the best to use—sycamore or holly for choice. On a panel of ¼in. wood mark out with compasses an outer circle of 12ins. diameter and an inner circle 9ins. in diameter and cut out this ring with the fretsaw. On the side which is to form the front of our frame, round off both inner and outer edges and glasspaper to a fine finish all over. Enamel or paint white and leave to dry. If it is given one or two coats of shellac, glasspapered down between coats before painting, a nice satin finish is obtained.

Now from ¼in. thick wood—plywood will do—cut out two rings, outer circle 11ins. and inner circle 9½ins., and glue together. When set, on one side of the completed circle mark out four equidistant points as in sketch, and chisel out four slots ½in. wide by ½in. deep. The side with the slots is now glued to the back of the front frame; that is your first circle.

Finally, to complete your plaque, glue and pin on a back circle of plywood 11ins. in diameter, first covering this with cartridge paper upon which to paint your sky in water colours. If you can obtain a piece of poster with the sky on it, you have a readymade background. Now purchase a piece of white rope ½in. thick and bind it around the plaque as in Fig. 3, using fine cord passed around the front circle and through the four slots to form the final lifebelt appearance.

In the bottom of the plaque, some nails are driven to hold your plastic sea—putty mixed with blue or green paint, as in Fig. 2.

Now to our little ship. Our sketch shows the stern plan and deck plan, from which you can easily build your hull. Afterwards paint it nicely and leave to dry. Fig. 5 shows sails and sufficient rigging for this tiny model, and having completed your ship you can mount it in your plastic sea and leave to set.

Finally touch up your sea with white touches. To finish off, use a painting of a similar ship at sea as a guide to finishing your action picture. (146)

QUESTION AND ANSWER

Question: *What are bolt-ropes?*

Answer: A bolt-rope is a rope sewn to the edges of the sails to strengthen them and prevent them from rending or tearing. The part of the bolt-ropes which are on the perpendicular edges of the sail are called the leech-ropes, that at the bottom is the foot-rope, and that at the top of the sail, the head rope. Staysails have no head rope. All ropes that control the sail for furling and unfurling are fastened to the bolt-ropes. This is the reason why we cannot show the complete rigging on models with parchment sails. When using fabric for sail material, we can incorporate the bolt-ropes and are then able to show as much rigging as will be in keeping with the scale of our model.

Question: *What is meant by 'tumble-home?'*

Answer: The term 'tumble-home' is applied to the part of the ship's side which falls inward above the main breadth, particularly in the galleon and wooden vessels up to the 19th century. See sketch. This gradual falling inwards of the upper sides makes the ship progressively narrower from the lower deck upwards. It was introduced in order to enable the ship to withstand the weight of the guns and the recoil of a broadside. A narrower upper deck meant deck beams of greater strength, needed because deck beams to run the full width of the deck were hard to get and when two or more lengths had to be used for a wide deck, the joints were a source of weakness. (147)

A Line Drier—(*Continued from page* 108)

For those who possess a workshop or garden shed, you will find it more convenient to fix the drier to a table or bench with a cramp. This can be adjusted in a moment and holds things quite steady while transferring or greasing the line.

Finally, do not be afraid of the soldering or drilling. If you cannot do it yourself, tackle a friendly garage proprietor, blacksmith or cycle repair shop—you will find they will be quite willing to help, if you explain exactly what you want. (115)

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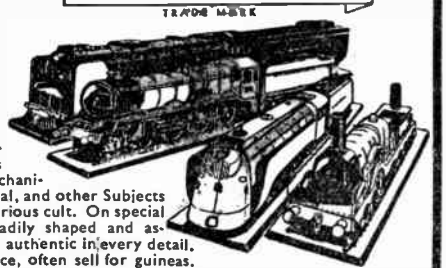

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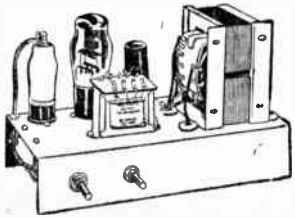

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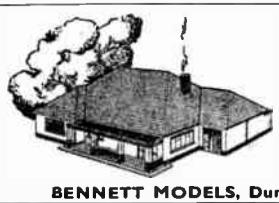

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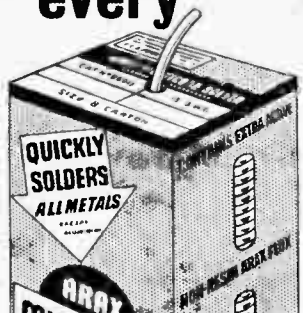

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Hobbies WEEKLY

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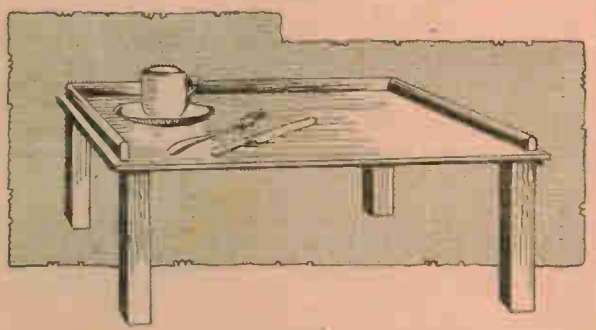


Instructions for making

A FOLDING BED TABLE

A YOUNG worker has asked for a simple design for a folding bed table, one that can be made from some odd pieces of wood, and such a design is illustrated here. When odds and ends of different kinds of wood are being used, they should be planed and glasspapered up clean so that the table, on completion, can be enamelled or painted an art shade of blue or green, or any other restful colour.

Washable Finish

A good finish like this is washable, and after a meal the whole thing can be w ped with a damp flannel before re-use. The size suggested for the table is, length 22ins., width 14ins., and height approximately 8¾ins.

For the tray itself, a piece of good plywood, if you can get it, is obviously the most suitable. Failing this as a single board, you can get two pieces of wood 7ins. wide and join them together. A neat and close joint should be made to prevent dirt and liquid working into the joint. The one-piece surface, of course, is much to be preferred. Check the board for squareness with a tee-square or a set-square, and then make all four edges smooth with fine glasspaper.

Wood ¼in. thick would answer providing it is of good quality, while ⅜in. stuff would make a much stiffer and better job. At a distance of ½in. in from the ends of the board, glue and screw on the cross battens (B), seen in the plan Fig. 1. These are 13ins. long and 1in. square in section, the sharp edges being papered off after fixing.

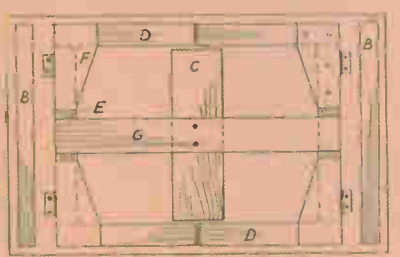


Fig. 1

Next prepare and fix piece (C), a piece of board 10ins. long by about 2½ins. wide and from ⅜in. to ½in. thick. Take care in placing this board to get it perfectly central both ways on the tray board. Run in four screws, but do not let these go right through the tray board so that they afterwards have to have the points cleaned off. It will be found that the tray board will be greatly stiffened by the addition of the three rails mentioned, and if these are used, the ¼in. thick stuff will be quite satisfactory for the tray.

The Legs

Next, take in hand the making of the two pairs of legs. These are identical in shape, and we therefore propose dealing with only one pair in our instructions. The construction is seen in the large diagrams Figs. 2 and 3, and in the details Fig. 4. It should first be shown how each pair of legs fold down flat on the underside of the tray, and how each pair is held in an upright position when required for use. Fig. 2 shows the legs folded flat, and Fig. 3 the same when erected. Each pair of legs forms an open frame, hinged to the tray underneath by a pair of stout brass hinges, seen in the detail Fig. 4 and in the plan Fig. 1.

The space between the rail (B) and the hinge rail (E) must be 1¼ins., this measurement being made up by the thickness of the rail (E), which is 1in. and ¼in. which is the thickness of the ply-

wood stiffeners (F). When the legs are raised it will be seen that the outer face of the legs, or rather the pieces (F), fit snugly against the rail (B), as seen in Fig. 3. The board (G) consists of a springy piece of wood which when the legs are raised, fall on the inner side of rail (E) and thus hold the legs in place as seen in Fig. 3. Likewise, when the legs lie flat they are held secure and firm, as Fig. 2.

Each leg frame consists of two legs (D), of 1¼in. by 1in. stuff, 8¼ins. long, with one rail (E) of similar section but 13ins. long. These three parts are firmly

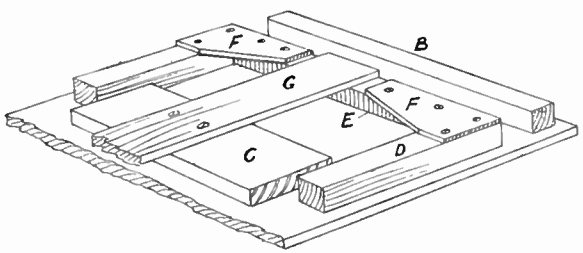


Fig. 2

framed together with the open mortise joint shown in detail in Fig. 4. The joint should be cut accurately and fit stiffly and then be glued and fixed, perhaps, with a hardwood dowel pin. Test the joint for squareness with a set-square or a try-square. When this has been done the ¼in. stiffening pieces (F) are glued and screwed on as shown. These pieces are each cut from a piece of plywood 5ins. by 2½ins.

Any rough or uneven edges must be cleaned off and made smooth for safety in handling. A pair of stout 1¼in. hinges will be wanted for each leg frame, of course, and they should be attached as the detail Fig. 4 shows. Take care to lay each leg frame carefully in place on the underside of the tray before running the screws in.

The piece (G) should measure about 16½ins. long and be 2ins. or so in width. It would be best, however, to test the piece for exact length before screwing it to the base piece (C). Almost the final operation in making the table will be the cutting and fixing of a raised rail or fillet round three sides of the top as pictured in our sketch of the finished article. The

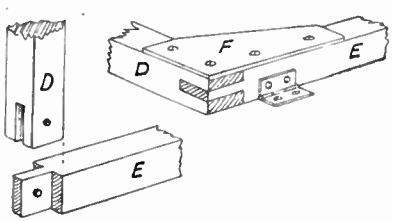


Fig. 4

pieces should be set in about ⅜in. from the edges, and stuff about ½in. by ⅜in. in section would be adequate. They may be simply butted together at the two back corners or, of course, they may be mitred. The latter method would look neater and be a more appropriate finish. The front ends of the side fillets should be made smooth with glasspaper and may be shaped to a quarter circle with

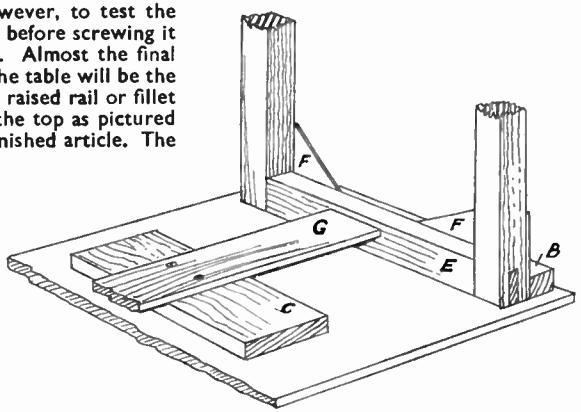


Fig. 3

the fretsaw and then cleaned up.

The whole of the woodwork should be well cleaned off with coarse and fine glasspaper if old and discoloured wood has been used. Paint or enamel as previously suggested would make a good finish, two coats being necessary to make a really satisfactory job.

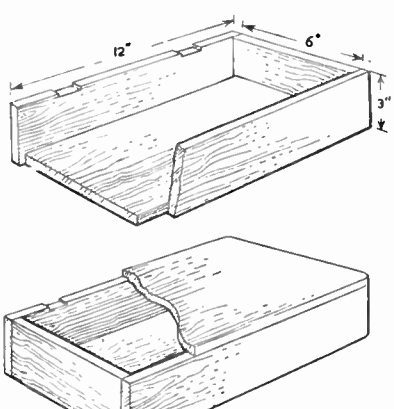
In conclusion, it should be noted that, when the legs are erected and it is desired to close them flat the ends of the piece (G) must be just lifted to clear the rail (E) of the legs and the latter then folded down. (128)

Word-Building Outfit—(*Continued from page* 115)

own children you may prefer to use a cardboard box as a container. If this is covered with a patterned paper, such as wall paper it will answer the purpose quite well. If, however, the letters are intended as a present, the box must look a little more professional.

The diagrams in Figs. 1 and 2 show how the box can be constructed. It is made entirely from ½in. wood and the dimensions are as follows: sides, 12ins. by 3ins; ends, 6ins. by 3ins.; base 11ins. by 6ins.; lid, 12ins. by 7ins. Notice that the ends go between the sides. Shallow recesses are cut in one side to take light brass hinges—about 1in. should be sufficient—and these are held in place by countersunk screws. Remember to make similar recesses in the lid, marking these off from the ones on the sides.

The box is put together with glue and nails in the usual way and cleaned up ready for the finishing touches. We suggest that it will look well stained and varnished or painted with black enamel. Of the two we prefer black enamel, because the brightly coloured letters



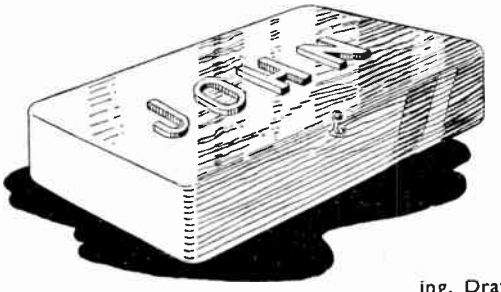
Figs. 1 & 2—Showing the construction of the box

look so attractive against the dark background. After the box has been painted and a small metal catch added, glue letters on the top to form the child's name. These will be in different colours and will, undoubtedly, appeal to the youngster. Lay the letters in position and lightly trace round them with a pencil. Now remove them and scratch off some of the paint from both letter and lid. This will prevent the letters from coming off after they have been glued in place.

The Alphabet

Finally, let us remind you that the alphabet can be used for dozens of other jobs, besides the one described. Name plates for houses, directional signs and even showcards can be made by using these letters. By means of the squares they can be enlarged to any size by those who are proficient at drawing. For those who would rather have the letters ready drawn we have prepared a plan with letters full size and ½in. squares to facilitate any further enlarging that may be required. The price of this plan is 1/- and may be obtained direct from the Editor, Hobbies Weekly, Dereham, Norfolk. (150)

Ideal for the youngster is this
WORD-BUILDING OUTFIT



WITH a little help from parents, learning to read can become an absorbing game for the youngster who is just starting school. With the aid of the outfit shown here, words are laid out on the table, are quickly memorized and then picked out from newspapers and books. Confine the words to simple ones of three letters at first and, when these are mastered, proceed to longer ones of two or three syllables.

Besides being an aid to education, the attractive box with the brightly coloured letters inside will make a welcome present at any time.

Cutting Out the Letters

It is essential that the letters are cut from plywood, otherwise they will break very quickly when handled. Offcuts of ¼in. or ⅜in. plywood will be suitable and the letters can be traced straight on to the wood to use odd pieces to the best advantage. The complete alphabet is shown drawn to half scale, and the squares are for convenience in enlarging. Draw out the ½in. squares on a sheet of paper and then sketch in the letters. This is not so difficult as might at first appear, as the thickness of each letter is ½in. and they have all been spaced in the squares so that extra measuring is reduced to a minimum.

Naturally, you will need more than just the plain alphabet if many words are to be constructed. You will need about five or six of each vowel (particularly E), and three or four of the more common consonants such as B, C and D. One each of the lesser used consonants will be sufficient. There is no need to trace all the letters on to the wood. Letters that are repeated are simply traced once, cut out and then marked round with a sharp pencil using the original letter as a template. When you have marked out the letters on to the wood, drill holes through the centres of such pieces as O, P, R, Q, etc. and cut out these first.

You then continue by cutting round the outside of the letters. If you have a fretmachine you will be able to pin two pieces of wood together and so cut two letters at the same time. Another time-saving point to remember is that, by placing such letters as E and F back to back, one cut will do for both letters. Much cutting can be saved by such manoeuvring when tracing the letters on to the wood.

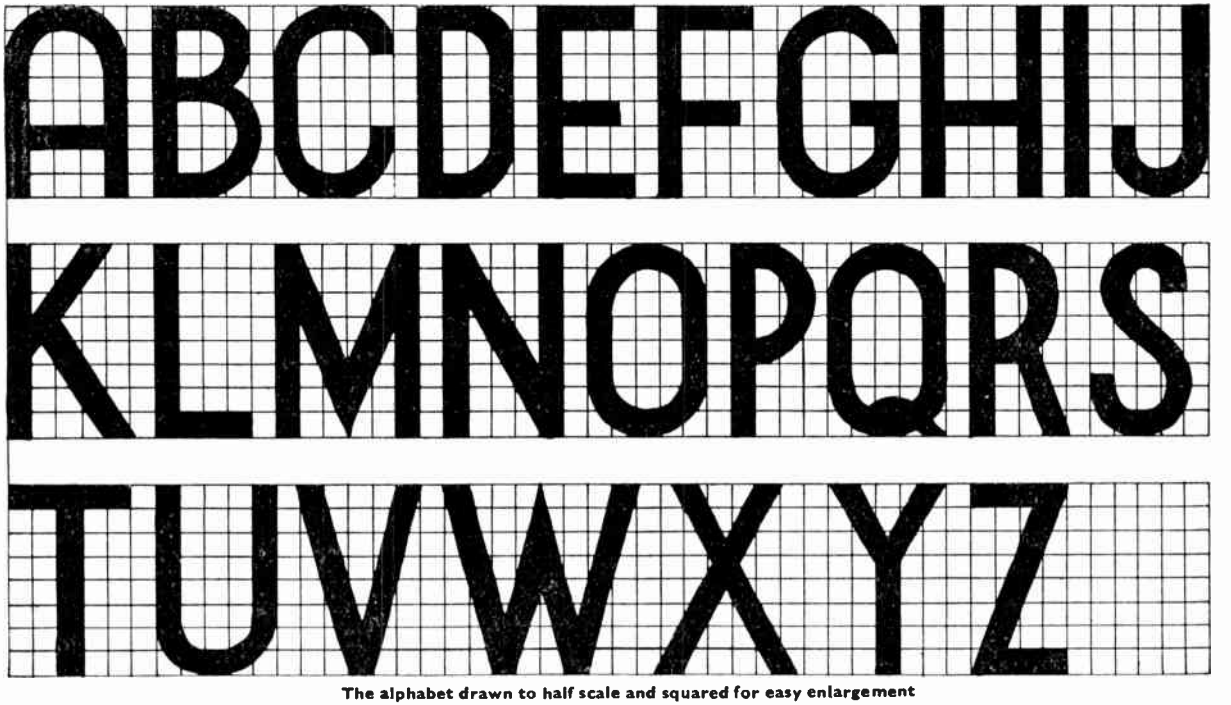
Painting

Clean up each letter with glasspaper and give two coats of enamel. You will find that the best method of painting is to hold the letter with a pair of pliers and paint one side and the edges. Lay them down on a newspaper and just touch up the spot where the pliers have been. The letters should be painted in various colours, all as bright as possible. Naturally, you will keep identical letters the same colour.

Making a Box

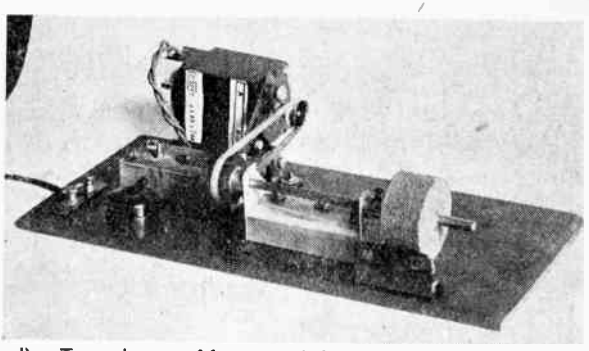
If you are making these letters for your

(*Continued foot of page* 114)



The alphabet drawn to half scale and squared for easy enlargement

Full instructions for making AN ELECTRIC EMERY WHEEL



ONCE made up this machine can be kept on hand for a number of purposes, such as polishing, sanding, grinding and sharpening tools, etc. It is made on a solid wooden base so that it can be brought out as needed, and though quite small it runs at high speed and will be found surprisingly effective.

A second shaft is used to carry the grinding wheel for a number of reasons. Many motors are not very well suited for direct mounting of the wheel on the spindle; the bearings are not meant for this, and grit, sawdust and metal particles will rapidly find their way into the motor. Furthermore, it is often of advantage to use a reduction of 1:2 to 1:5 or so to increase the power. As many motors run at 3,000 to 6,000 R.P.M. the reduction in speed will be an added advantage.

Fig. 1 shows dimensions and positions of parts. (For clarity the motor mounting, shown in Figs. 2 and 3, is omitted). To make a really firm fixture, bolts passing completely through the base are recommended.

The motor is mounted on a piece pivoted to two small brackets (see Fig. 2). When these brackets are bolted to the base, the motor can be rocked backwards and forwards. It is held in position by the slotted strip shown in Figs. 1 and 3. This strip is pivoted to a bracket attached to a block of wood, as illustrated, and takes the pull of the belt. In the motor used four long bolts passed completely through to hold both end-plates in position. One of these can be replaced by a screwed rod about ½in. longer, a suitable nut or terminal-head being tightened up against the slotted strip after adjusting the belt tension.

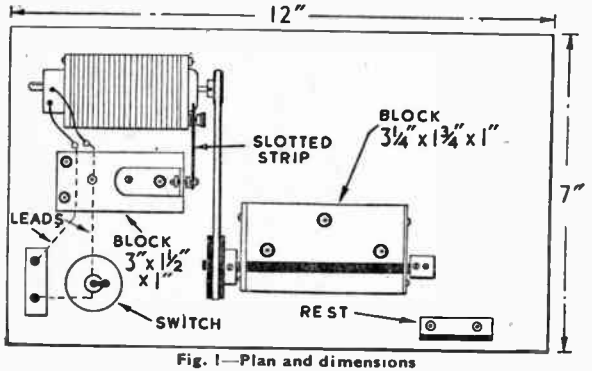


Fig. 1—Plan and dimensions

Base and Mounting

All the pieces can be made easily from scrap metal, but the belt may require a little ingenuity and this item should be obtained first so that the distance between the spindles can be arranged suitably for it, and the wheels used. A thin belt of the jointless composite variety is best. Failing this, a pliable strip of thin leather, or a strip cut from a worn-out cycle tyre, can be tried. Or a *good* leather shoelace, which is surprisingly strong.

Tension on the belt is adjusted by rocking the motor, a slotted strip holding it in the necessary position. But care should be taken that the distance is approximately correct for the wheels and belt, as mentioned.

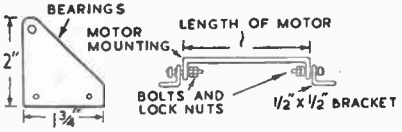


Fig. 2—Details of small parts

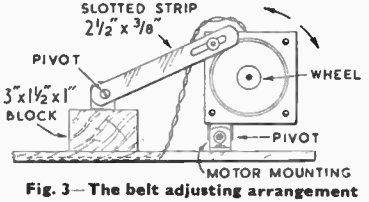


Fig. 3—The belt adjusting arrangement

Motor and Connections

The two flexible leads from the motor pass through the base and to the switch and terminals, as shown in Fig. 1. This provides a handy way of starting and stopping, but if a mains motor is used, then two bare terminals, as illustrated, should not be used. Instead, insulated connections should be taken directly to the motor and switch.

Many different types of motors are now easily obtainable. Some can be operated directly from A.C. mains, while others are intended for accumulator supplies, or for 24 or 36 volts from a mains transformer. Many excellent ex-service motors are available at extremely low cost, and one of these for the supply to be used may be chosen. For small work a motor larger than ⅛ H.P. is not required.

The motor mounting should be free from wobble and the wheels must be accurately in line for the belt to run properly. A slot about ¾in. long in the slotted strip permits the motor to be tipped.

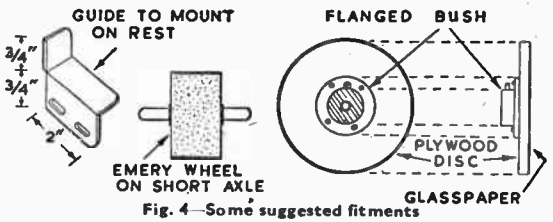


Fig. 4—Some suggested fitments

Secondary Shaft

The size for the bearings for this is shown in Fig. 2. Stout material is required (14 or 16 S.W.G.) and small holes enable the bearings to be screwed to the block bolted to the base.

For the spindle, ¼in. diameter rod is convenient, and ¼in. diameter holes will be required in the bearings. If the material used wears rather quickly, then brass bushes with ¼in. holes can be soldered on to increase the bearing area for the spindle.

The ratio between motor and spindle is not very critical, and can be changed

(*Continued foot of page* 118)

For amateur photographers—methods of

MAKING YOUR OWN PRINTS

THERE was a time when amateur photographers had to do their own printing or take their negatives to a professional photographer for this purpose. Such a notion as taking a spool of film to a chemist or dealer to be 'developed and one print from each' was practically unknown.

It was my good fortune, in my very early days, to be much in contact with some of those 'old-timers', and there is, no doubt, that it was their very excellent and charming results that greatly influenced me to take up photography as my hobby, to learn to do my own processing, to study the pictorial as far as possible in the selection of subjects, and, thus, to get the utmost pleasure and interest out of it.

Cause of Satisfaction

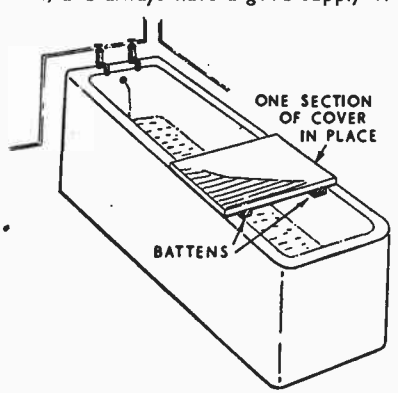
It has often been a matter of great satisfaction to be told by people examining some of my prints that they are so different, and to be asked numerous questions relating to the process, as though there were some secret about the method or way in which an enlargement or even a contact print is made. Of course, experience helps one to excellence, but the actual function of printing is extremely simple, very interesting, and, undoubtedly, economical.

If any reader is anxious to get to an advanced stage quickly, or to become a recognised professional photographer, then there is a wonderful school for this particular subject in London where all that matters in the art is taught; but if photography is just your hobby, then it will pay you to start doing your own developing and printing as soon as you can, and you can be assured that, from the commencement, you will see an improvement in your work.

The same question always pops up when this subject is raised—'What am I to do for a darkroom?' Those of you who can select a small room in the house and call it your den are particularly fortunate, but such accommodation is quite unnecessary. If you have not a large cupboard or space in the loft, then what is the matter with the bathroom or kitchen. Either is serviceable for the work. There is light and water laid on and, as a rule, plenty of ventilation. If electric lighting is there, it is an easy matter to extend an extra lead from one of the points for an orange light and at the same time retain the white light. This latter should be suspended over the table on which you will be working, and the orange lamp should be actually on the table and near to the dishes. The white light should be convenient for switching on and off quickly.

If it is more convenient to use the bathroom, then I would suggest that a portable cover be made that will fit over most of the bath. If this is in three-ply or similar wood, and in two sections, it can easily be stored out of the way when not in use. Each section should have a batten of 1in. square running along two of its sides and these should just fit the inside of the bath to prevent movement or slipping when in use. The sections can be hinged together by means of strong adhesive linen tape if desired.

Do not cover the whole length of the bath, and always have a good supply of



Making use of the bath

water in it when working. There are two reasons for this. The first is very important. The water will prevent the bath being stained should you have the misfortune to spill some of the chemical solution in it. Secondly, it is advisable to have a supply of water handy for dropping the prints into as they come out of the fixing solution.

Having settled the question of accommodation, the next point to tackle is apparatus. Do not get the idea that a lot of expensive dishes, lamps, etc., are necessary. Naturally, some money has to be spent on this hobby as with all hobbies if you want to really enjoy them. You will require an orange lamp; one ½-plate and one ¼-plate dish (and the deep pattern is well worth the little extra cash); two measures (a 4oz. and a 10oz. are the most useful sizes, and the 4oz. should have ½oz. and ½oz. well marked); one printing frame, ¼-plate size, complete with a piece of glass and a black mask with the centre cut out to take a film 3¼ins. by 2½ins. if contact prints of this size are to be made.

These pieces should cost round about 20/- but if it is your intention to start developing your own films as well as doing your own printing, then call at your nearest dealers and ask to see one of Johnsons outfits. There are four different sizes each containing the necessary equipment, and they vary in price from about 30/-.

Choice of Paper

There are two kinds of paper on which to make your prints—contact, sometimes termed gaslight, and bromide. The latter is much faster than the contact variety and because of this characteristic, beginners are often advised not to use it until they have had some experience with the contact. Both grades will, however, be dealt with in these articles.

Do not start with a lot of chemicals. You need only two or three. One M-Q (metol-quinol) Pactum Developer, a 4oz. tin of acid-fixing, and, perhaps, a small bottle of soda metabisulphite.

Now that you are interested in doing your own processing, I would strongly advise you to standardise each branch of the work as much as you possibly can. This is the surest way to save money and time, and it, undoubtedly, produces better and more successful results.

To illustrate what is meant by standardising, let us first consider the negatives you are contemplating printing. Some of these are very good. The exposures were about accurate and they are full of detail. Place them in a group and call them normal. Then there happens to be some that are very 'thin'—the image is not so well defined as in the 'normal' negatives, probably the exposure was too short or the light not good. Group these and call them the 'thin' group. There are also some that are very dense. It is difficult to trace the image because they had too much exposure. These must be placed in the 'thick' group.

Each of these groups will require different exposures when printing, but the difference must only refer to the time you allow the printing frame to remain under the light. In other words there is no need to use a weaker or stronger light for the 'thin' and 'thick' groups. Always work with the white light at a 'standard' distance from the frame. For contact paper this should be 12ins. and for bromide paper 4ft., with a 40 watt electric bulb.

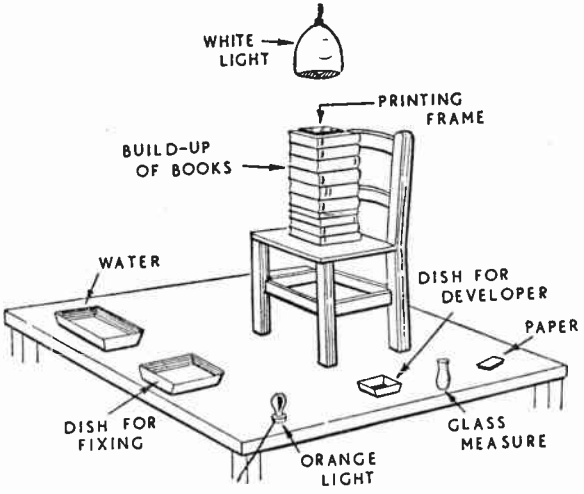
The table on which you do the work should be placed, if possible, under a

hanging lamp and, if necessary, a chair can be placed on the table and the printing frame can be laid on this. Then, if the distance between frame and lamp is more than the 12ins., reduce it by placing a few books on the chair and so build up to the required 1ft. and be sure to measure this with a rule. Remember, all haphazard work is taboo. Should a hanging light be impossible, then a standard table lamp must be requisitioned and the frame placed in a straight line with it on the table or the cover of the bath.

All printing papers are made in various grades and surfaces to suit all tastes and, incidentally, to suit the many types of subjects, but you are very strongly advised not to lumber your workroom or cupboard with a lot of different packets. It is far better to stick to one grade and surface till you have mastered its special properties and until you understand the elementary technicalities of printing. You will then be much more capable of exploiting the advantages of some of the more, let us call them, advanced types. Therefore, start off with a normal grade of a matt or glossy surface whichever you prefer.

We will now assume that you have a packet of contact paper and a M-Q Pactum of developer. The contents of this latter have to be dissolved in 4ozs. of water. The fixing bath is prepared by dissolving 2ozs. of the acid-fixing powder in 30ozs. of water. By the way, if you have no 10oz. measure, you can always use an ordinary tumbler glass which holds ½pt. (10ozs.) of water.

Everything is now set for your first printing, and, having placed the developing solution by the small dish and the fixing solution at the side of the larger one, select one of the normal grade negatives and place this face upwards in the printing frame. Face upwards means the emulsion side upwards. Now turn out all white light and see that no light from anywhere else is finding its way in. Switch on the orange light and take one piece of paper from the packet and make sure that the packet is closed again. Place this paper, emulsion surface down, on to the negative and close the frame securely.



The table set-up

Place the frame in position, i.e. 12ins. from the white light, switch on the white lamp and by your watch give an exposure of 6 seconds, then immediately switch off the white. Negatives in the 'thin' group will require less, and the 'thick' more, than the 6 seconds exposure.

Avoid 'Airbells'

Remove the piece of paper, place it face upwards in the dish and carefully but quickly pour on the developer avoiding any airbells. Rock the dish so that the paper is kept completely covered. Development is very rapid. The image will appear in about 30 seconds, and will be complete in approximately 1½ minutes. When no further action occurs, remove it and place it in the fixing bath and see that it is well covered with the solution. Do not be in a hurry to see your first result, give it at least 5 minutes or even 10. Then it is safe to switch on the white light; it should be left in the fixing bath for 15 to 20 minutes and then placed in running water for ½ hour to wash. Finally, pin it by one corner to a shelf to dry.

If the first experiment results in the image not being fully revealed, then the exposure time was not quite long enough, or if the print is too dark, then the exposure was too much; but it must be understood that if the grading of your groups of negatives has been accurately judged and you have done the work as explained, then that first print should prove satisfactory.

Storing Solution

Keep the solutions. If you can use the developer in one evening, you will find it will develop about 40 prints 3½ins. by 2½ins. If you can do only a few prints, then store the solution in a well stoppered bottle. It should keep well for about two weeks, but it loses strength every time it is used or exposed to air. The 30ozs. of fixing solution is sufficient for about 100 prints, but keep it in a bottle when not in use.

Wash dishes and measures. Cleanliness is essential in photography—and be sure to remove any traces of your work from the kitchen table or bathroom.

Bromide printing must be left for a future article when the author will write about enlarging and picture making. (142)

Electric Emery Wheel—(*Continued from page* 116)

quite easily if a few wheels of different sizes are to hand. A collar with set screws on the free end of the spindle enables different grinding wheels, etc., to be used.

Extra Fitments

A simple tool-rest consisting of a bracket is shown in Fig. 1. The guide illustrated in Fig. 4 can be mounted on this rest and will be found convenient for some types of work. Fig. 4 also shows how an emery or sanding disc can be made up to provide a rapid flat surface for small woodwork items. If the screws holding the rest are removed, the work can be slid against the disc flat along the base. A medium grade of glasspaper is best for most woods, and the disc should not be more than about 3ins. in diameter. Small wood screws hold the bush in place. Glasspaper can be secured by gluing, or taking flaps over to the back of the disc and fastening by means of drawing-pins.

The bearings should be oiled, of course, though too much lubricant should not be applied to the motor. A tin cover may be cut to fit over the latter, though as it is some distance from the work much abrasive dust will not settle on it. The belt should not be unduly tight, only sufficient tension to prevent slipping being necessary.

If the motor does not run clockwise, and cannot be reversed, then it may be mounted the other way round. As the belt is so short, crossing it is not recommended. (137)

Concluding our article on making

YOUR OWN DUCK PUNT

IN a previous article the building of the punt was described up to the point where the two bulkheads were fixed in position between the side planks, which were connected to the bow and stern posts.

Slots measuring 1in. long by ¾in. wide have been previously worked at top and bottom of each bulkhead. Four lengths of stripwood of the same end-section are taken and threaded through these holes after being coated on the inside face with red lead. Having been slid into position they are screwed to the inside of the side planks. The two upper strips form the gunwhales of the punt, while the bottom pair are the chines. The position of the gunwhales can be seen from the plan at (A).

Fixing the Floor

The next step is to fix the floor, which should be of grooved and tongued boarding. All joints should be leaded before being fitted together, and the ends of the boards are screwed down to the bottom of the side planks and chines, using brass screws. With a compass, saw and plane, the ends of the bottom boards are trimmed off level with the sides.

To enable the punt to be slid freely when launching, six longitudinal rails are put on the underside of the boat, all being of 1½ins. by ½in. end-section. Two short pieces (which will have to be slightly shaped on the outer edges) are level with the sides of the punt amidships, with the remaining rails spaced out equally between them. Drawing (B) gives a section through the bottom of the punt and shows the sides, chines, bottom and rails.

Deck Bearers

After the bottom and longitudinal rails have been fixed, the deck bearers are made and fitted. These are of 2½ins. by 1in. section laid on the flat, and run from midway along the end of the cockpit opening to the end post at each end of the boat. Each end of each rail must bed down into slots cut in the cockpit rail and the post. The top faces of these rails are eased off with a plane to conform to the shape of the top of the cockpit rail. Glue and screws are used to fasten the ends of the deck bearers into place.

Each deck bearer rail is supported on two uprights spaced at equal distances apart between the cockpit opening and post, these uprights being 2½ins. wide and 1½ins. thick, screwed into place through the deck beam and bottom boards. The position of these uprights is shown in dotted lines on the plan at (A).

To make the top of the canoe more rigid a rail is put between the inside of the hull and the long side of the cockpit opening at each side, halfway along the length of the cockpit. These rails should be cut from 2½ins. by 1in. material, being worked on the top edge to the same shape as the top rail of the bulkhead. One end of each short rail butts against the edge of the cockpit, while the other end is cut out to house round the gunwhale and then butts against the inside of the punt side, where it is screwed into place.

A good quality three-ply should be used to cover in the deck, this fitting flush with the edges of the punt and the inside of the cockpit opening. This plywood is fastened down with small brass screws which must be driven well in so that they do not project above the wood (see drawing C).

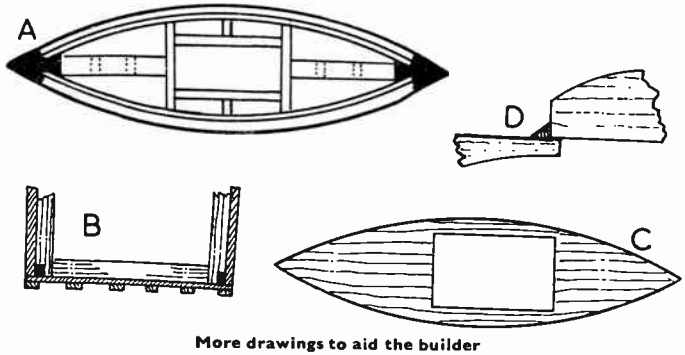
The plywood is covered with canvas, which is glued into place. An assistant's help will be useful in stretching the canvas, which must be pulled as tight as possible. To prevent the glue drying, it should be put on the plywood in comparatively small patches, the canvas pulled tight and smoothed down over it, and then tacked down, using copper tacks. On the edges the canvas should finish just short of the side planking, and is turned under slightly to prevent fraying. Round the cockpit the canvas is pulled down over the rails and tacked down on the underside.

Cockpit Framing

The sides of the cockpit opening have then to be framed with four strips of ½in. thick wood. For the short sides these are 4ins. wide, but on the ends are 6ins. wide with the top shaped round to conform with the cockpit rails there. These strips are mitred at the corners and screwed into place, their lower edges flush with the bottom edges of the cockpit opening. A small triangular moulding mitred round the outside of the cockpit opening so that its sides butt against the deck and the edge of the cockpit, will help to keep the latter watertight (see sectional view at D).

Small Moulding

A small moulding is also fitted round the outside of the bottom of the punt to cover the meeting edges of the side and bottom; this moulding should be well red leaded before being screwed into place.



More drawings to aid the builder

The punt should then be completely watertight, but before putting on the priming coat of paint the boat should be floated in a stream for a couple of days to see how much water leaks in. Any bad joints can be 'caulked' by teasing out some rope strands and forcing a few of these into the affected joint, running in a little pitch above them.

Painting

Two coats of a dark green or similar colour paint can be given to the punt, following this with a 'marine varnish'. The deck canvas need not be painted, but if a sufficient quantity of boiled linseed oil is obtainable, some driers should be added to this and the canvas given a couple of coats of the mixture to make it waterproof.

A punt pole can be purchased or shaped up from a length of ash of about the same length as the hull. If home-made, it is advisable to paint bands of colour on the pole, each band being about 12ins. apart. They then serve as a guide to the depth of the stream when punting. (417)

How to make
A COLOURFUL WEATHER HOUSE

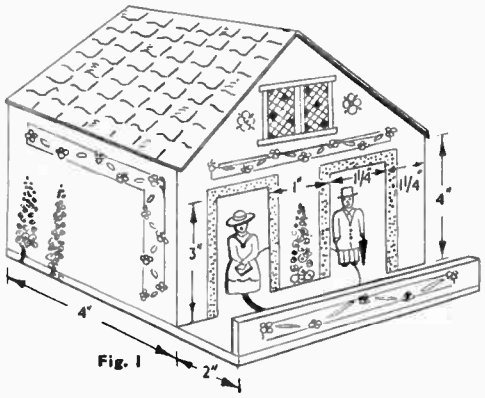


Fig. 1

THIS is a model which will give satisfaction not only in the making but also in use, and if it occasionally gives a wrong forecast—as indeed most really good forecasters invariably do—it does at least remain decorative while it makes its mistakes.

Construction

As will be seen from the sketch (Fig. 1) the 'cottage' of this hygroscope

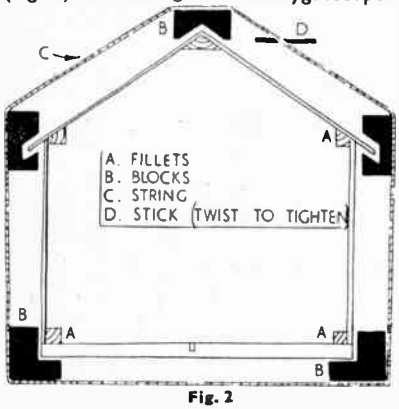


Fig. 2

is a simple box-like structure covered with a ridge roof. Three-ply is used for most of the work but the base, dwarf-wall and sundry other items may be conveniently made from ordinary ¼in. thick wood of suitable size.

Construction is quite straightforward. Make the base first and then add the sides, back and roof. The fastening of the front, however, is best left until the hygroscope has been set up and found to work correctly.

As the work is of a somewhat light nature, it is advisable to restrict, so far as is possible, the use of nails in construction, and rely on the use of really good glue correctly applied, to give the model its strength. It follows that the work must be securely cramped-up while the glue is setting and should be left undisturbed for at least forty-eight hours after the application of the glue. The fillets shown in the sketch (Fig. 2) give additional surfaces for the glue to grip and hence greater strength. The same sketch also shows a method of cramping-up the joints if the proper apparatus is not available.

Setting Up

The general layout of the hygroscope is shown in the sketch (Fig. 3) which practically speaks for itself. It is worth remembering, however, that the disc should hang level and be free to move around its axis. The catgut should be of such a length that it is drawn taut by the weight of the disc and figures.

The hole in the base for the axis pin should give only sufficient clearance to permit the pin to turn without friction. Too much clearance at this point leads to a slack bearing which inevitably binds to a greater or lesser degree as the pin is not in an upright position.

There is nothing very difficult about setting-up. Turn the setting plug (X) until both figures are looking through their respective doors and then leave until there is a change in the weather—seldom very long in this country. The setting plug should now be adjusted, if necessary, to give the correct indication, namely, the lady to come out in fine weather and the gentleman in wet. If it is found that the reverse process is happening, it will be necessary to untie and invert the catgut, tying that part which was formerly at the setting-plug to the disc and vice-versa.

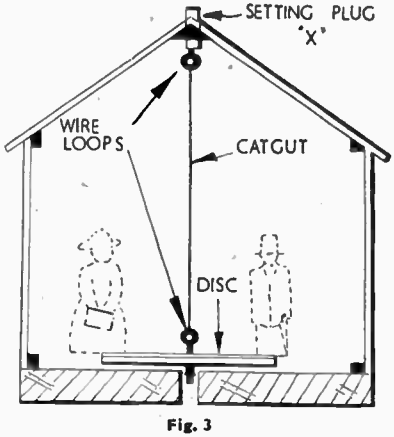


Fig. 3

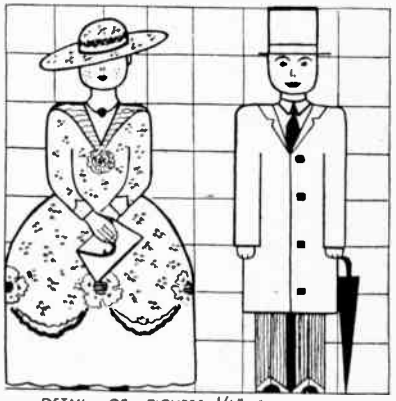
Finishing

Carefully glasspaper the model, give a dressing of wood-filler and then glass-paper afresh—this time with fine glass-paper, a trifle worn, to ensure a really smooth surface. Next give a coat of size and allow this to become thoroughly dry before starting to paint.

CUTTING LIST

Part	No.	Size
Base ...	1	6" × 6" × ¼"
Sides ...	2	4" × 4" × ⅛"
Ends ...	2	6" × 6" × ⅛"
Roof parts	2	4½" × 4" × ⅛"
Dwarf wall	1	1" × 6" × ⅛"
Figures ...	2	1" × 2" × ⅛"
Disc ...	1	3" dia. × ⅛"
Setting-plug	1	⅜" tapered to ¼" × 1"
Catgut* ...	1	7" to 8"
Fillets ...	various	¼" × ¼" or ⅜" × ⅜"

*Part of a violin 'G' or 'D' string.


DETAIL OF FIGURES ¼" SQUARES

The general scheme of decoration is clear from the sketch (Fig. 1), but the choice of colour and finish—matt or gloss—is largely a matter of personal taste. The following scheme was applied to the prototype model and was found to give a pleasing effect:—

Walls and base—Cream (two coats) matt.
Roof—Brick red (two coats) matt.
Trellis, disc, window frames and door edges—Dark brown (one coat) gloss.
Roses— Red on green foliage—gloss.

(*Continued foot of page* 121)

A combined box and DRAUGHTS BOARD

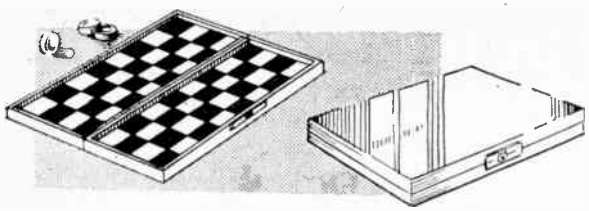


Fig. 1—The board completed

THE handy combined draughts board and box shown in the illustration Fig. 1, would be useful to the home player as well as to the traveller.

The draughtsmen, too, are kept in the box and, therefore, always at hand when wanted. The box has been designed to a useful size and is 7ins. long, 4ins. wide, and about 1¼ins. deep. For the sides and ends of the box, ¼in. thick wood is suggested, with ⅛in. wood, plywood for preference, for the top and bottom. The box may be made up complete, and the checkered boards glued in afterwards.

The Best Way

The best way to make the box, and the only known method of getting a perfect fit between box and lid, is first to make up the frame of four pieces and then to attach the plywood on each side, as shown in Fig. 2. Good glue and a few fine nails or even fret pins should make a strong job, and when this is done, a pencil line must be drawn all round the edge exactly half way between the top and bottom surfaces as shown.

The box is then placed in a wood vice,

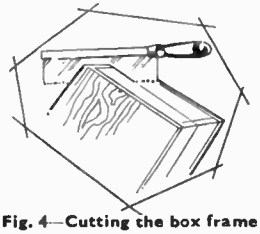


Fig. 4—Cutting the box frame

held cornerwise and sawn down with a small-tooth tenon saw as shown in Fig. 4. The vice must not be screwed up too tightly, or the saw will stick, and it will be found impossible to proceed with the cutting. Note in the construction of the frame for the box that the sides are made the same length as the plywood, and that the ends go in between them.

When the two parts are severed, each cut edge should be laid flat on a sheet of glasspaper and gently rubbed in the direction of the grain of wood of the sides. A perfect fit is ensured when the two halves are later put together and fastened by the hinges.

Fig. 3 shows one of the 'trays' with shallow recesses cut in one edge to receive the flaps of the hinges. If the somewhat difficult task of fixing these plain type of hinges is not desired, then a

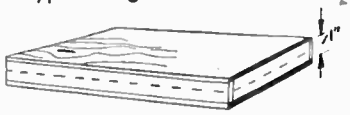


Fig. 2—Making up the box

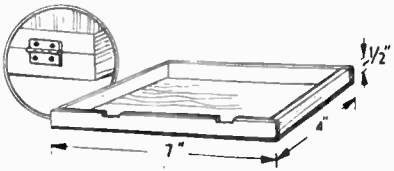


Fig. 3—Details of the hinges

pair of ornamental hinges or even a plain pair may be put on, as shown in the circled diagram in Fig. 3. These latter pair of plain hinges may be simply opened out and screwed on flat to each leaf of the box. The completed box must be thoroughly cleaned up with glasspaper, especially those edges which have been cut with the tenon saw. Clear varnish will make a very good finish to the wood, or ordinary oil paint of art shade and matt in finish might be used.

The Board

There are two ways of making the playing boards. One is to cut two pieces of faced plywood to size to fit into the box exactly, and then draw the squares and fill them in with stain or indian ink.

The second method entails rather more work and detail, and is by the simple inlay method using two varieties of wood, a light wood like sycamore and stained mahogany, or, if obtainable a piece of dark walnut.

Four strips of each of these woods must be cut, measuring 7ins. long and ⅞in. wide, and laid as arranged in Fig. 5. Their edges are glued together, and across these strips rule a series of lines ⅞in. apart. Cut through these with a fine fretsaw.

This will leave a number of strips of light and dark squares and by reversing some and putting black to white, a perfect checker pattern results. Now cut the board down the centre and finally glue each in the trays, glasspapering the edges slightly if needed, to make a perfect fit. Clean up the surfaces with fine glasspaper and coat over with clear varnish.

The Draughtsmen

The draughtsmen may be bought from almost any stationer's or fancy shop, or they may be cut from ¾in. round rod. If

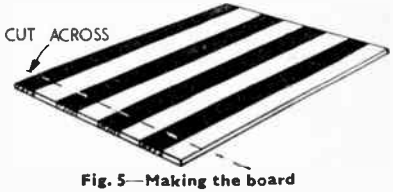


Fig. 5—Making the board

this latter idea is adopted, twenty-four 'men' will be needed. Twelve of these will be stained or painted black or coated with Indian ink. Care must be taken in glasspapering each disc to get them flat and even all round, and with the sharp outer edges just taken off.

The box can be fitted with a catch which may be purchased from Hobbies Ltd. and is of suitable size and pattern. Hinges suitable for the box, either ornamental or plain can also be obtained from Hobbies Ltd. (124)

Colourful Weather House—(*Continued from page* 120)

Hollyhocks—Yellow on green foliage—gloss.
Lady—Two shades of pink, white, pale blue and red—matt.
Gentleman—Black and grey—matt.
Windows—Grey-blue—gloss.

It is worth while spending a little time in getting the colour scheme right and the painting neatly done as it is on this that much of the charm of the model depends.

One final word. It will be seen that the representation of the trellis and flowers are somewhat irregular in the sketches. This is quite intentional and strongly advised as a regular and symmetrical layout would be out of place in decoration of this kind. (129)

CHROMIUM POLISH

Any time you wish to put a shine to your handlebars, or other chromium, just mix some whitening with paraffin and make a thick solution of it. Then get a piece of rag and rub it well over your handlebars, finishing off with a nice piece of dry rag.

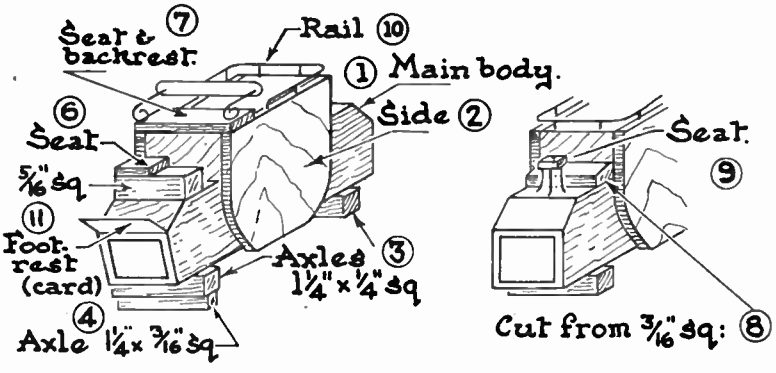
Complete instructions for making

A MODEL STAGE COACH

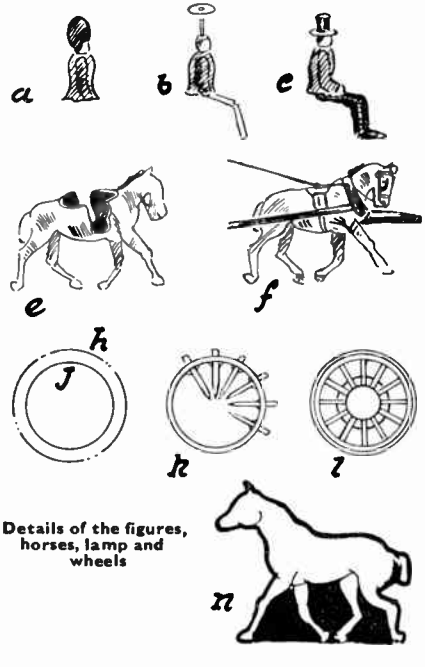
THE model stage coach which forms the subject of this week's special design sheet (see patterns on the inside back cover) can either be made as a model in its own right or in connection with the old-time street of model shops and houses. (See *Old Curiosity Shop* in our issue of September 13th, 1950. *Village Smithy*, October 17th, 1951. *The Crown Inn*, October 31st, 1951 and its *Archway* extension November 7th, 1951. The present model is planned to the same scale as these previous models. Some reasonably fine work is involved although it is not of the landscape-painting-on-a-pinhead type of work. Those who want to make a larger scale model coach alone and not as part of the model High Street should see details of special design No. 206 in Hobbies Handbook.

Part 1 of the full-size designs shows a profile of the *main body* which is cut in $\frac{7}{8}$in. thick wood, either as a whole or built up of three pieces as indicated. The *sides* (part 2), of which two are required, are cut in $\frac{1}{8}$in. plywood and glued in place.

A study of the first perspective drawing will show, better than a lot of words, how the axle trees and the various seats and boxes are added. The rails and other wire work can be made now but not finally fixed until after the model has been painted. The curved part of the chassis (part 12 in the full-size patterns) is cut from $\frac{1}{4}$in. plywood and fixed as shown in the perspective sketch.



Drawings which explain the construction of the coach



Details of the figures, horses, lamp and wheels

The patterns, part 13, are carefully cut out and pasted to the wood, permanently. When dry, the stars and double lines may be painted in gold or yellow, the black part left black and the white portion of the design painted a bright red. Water colours may be used here if varnished over afterwards with a clear water-colour varnish (from art shops). The rest of the model is painted with enamel paints (or poster paint afterwards varnished) in a scheme of red and black picked out here and there with gold or yellow.

The wheels may now be tackled. Two short wooden cylinders are required, one $1\frac{5}{16}$ins. diameter for the large wheel (h) and one 1in. diameter for the smaller wheels (j). Cut some long strips of white card $\frac{1}{4}$in. wide and wind them round the moulds until two large and two small rims have been formed $\frac{1}{16}$in. thick. Whilst winding, smear the strips with thin glue though take care that the rims do not stick to the wooden moulds. Slip rubber bands round the rims to hold the strips in position whilst the glue is drying.

Full size patterns on page 127

When dry, make twelve small holes round the rim with a small, sharp-pointed bradawl, spacing out, preferably, by means of small spring dividers. Burrs will be made by the bradawl but do not remove these.

For spokes use ordinary matchsticks sandpapered smoothly to a round or preferably oval section. Sharpen the ends to a wedge shape. This not only enables the spokes to be more easily inserted through the holes in the rims but enables the twelve spokes to meet at the centre (k). Take care not to distort the rim whilst this is being done. Leave

the ends of the matchsticks projecting at this stage.

Glue on the hubs, using plenty of glue, provided it does not ooze out beyond the limits of the hubs. At the rear of the wheels a fairly large diameter hub can be used as this helps strengthen the wheel, but on the front, a hub compatible with the scale of the model must be used. It is a disc of cardboard. Leave the glue to set, taking care to see that the wheel is not distorted in any way. Then, with a piece of safety razor blade, cut off the projecting ends of the matchsticks, glass-paper the rim and then apply the $\frac{1}{4}$in. strip again so that the rim is, in all, $\frac{1}{8}$in. thick (l).

With the point of the bradawl, now press down the burrs on the inside of the rims. Finally, lay a sheet of fine sandpaper on a smooth, flat surface and rub the wheels gently on it so that the wheel is smooth and flat. Give the wheels a coat of thin glue to act as a size, and then paint the spokes red and the rims and hubs black. A hole is drilled in the centre of each wheel to enable it to be nailed or screwed to the axle. The wheels thus made are surprisingly strong, but it is not intended that the coach model be used as a toy and continually drawn along. See that the wheels are upright, all touching the ground, etc.

The Horses

As regards the horses (four being required) these can either be made by the reader or else purchased as lead, etc., toys. It is quite possible, if one looks around and doesn't mind trying a dozen or more shops, to find horses exactly (or almost exactly) what one requires, i.e. a trotting horse of the size shown in part 14 of the full-size patterns. There is an admirable tendency nowadays to put out lead models in other than crudely daubed imitations of Ruritanian cavalry. But these models of mounted riders may well be adapted to present needs since one obtains from them the main material for the driver, etc., of the coach.

Adapting Mounted Riders

Such mounted riders would be about $1\frac{1}{2}$ins. high at the *saddle*. Cut off the mounted figure very carefully with a penknife (a), and still more carefully cut away the rider's legs, etc., remaining in the horse's flanks. One can *very cautiously* touch the unwanted parts with a small soldering iron or something similar, but extreme care is needed. The mutilated horse (e) is then stuffed with fine tissue paper as much as possible and the rest filled up with plastic wood, this being done in several layers. Make little attempt to model the wood at first. Wait until it is set and then carve or glasspaper. The horse can have a bridle made of plastic wood. Afterwards paint the horse grey and simply paint the harness on in black (f).

For the coachman, cut off the soldier's busby, fill the hollow body with plastic wood and insert a piece of matchstick in the head, and a bent piece for the legs (b). The legs are then 'fattened up' with plastic wood. Before this sets, the correct length and bend are ascertained by testing on the coach model. The hat is made from a disc of thin card and plastic wood. Gummed paper is used to form a cloak (d).

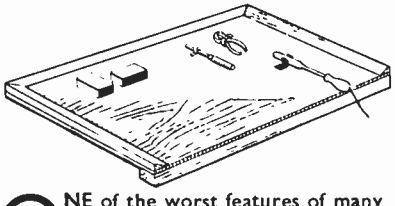
But for those who have skill in fine, accurate cutting with a fretsaw, the horses can be made up by cutting parts 14, 15 and 16 (shown full size) in $\frac{3}{16}$in. material. A plastic is advised since plywood is too coarse and solid wood too delicate. Part 16 is the 'meat' so to speak, in the 'sandwich' of parts 14 and 15. After assembly, the body and legs may be filed to get a rounded effect. The really keen model maker may take note of the fact that if he makes one horse well, in plastic, he can make a mould of it and cast the other three horses, using either the traditional lead-casting method or the newer type plastic moulding, details of which are advertised from time to time in these pages.

Another Method

A somewhat inferior method, but justified where the model street is to be viewed from a distance as, for example, in a window or similar display, is to combine parts 14 and 15 on one flat piece, say, $\frac{3}{16}$in. plywood and black out the spaces between the legs, not cut them (n).

As has been mentioned before in connection with these models, the printed diagrams and instructions are intended only to give bare essentials. The model maker will regard them as a *starting point*, not an end in themselves, and add his own personal touches. Detail (g) for example, shows a carriage lamp. (494)

Have a Bench in the Living Room



ONE of the worst features of many hobbies is the way they have to be pursued on a work bench. Radio and fretwork enthusiasts are liable to be accused of unsocial habits when all that makes them go away from the family is the apparent impossibility of working on the living room table without irreparably damaging it!

Seeing a neat board device for preventing accumulators from damaging a bench used for battery charging gave the author the idea of similarly covering a table whilst it is used for hobby work. The result is shown in the accompanying diagram.

Three ply, or thicker, hardboard, or any sheet of thin wood forms a table cover prevented from slipping from the working edge of the table by a long plane batten of soft wood or any other that may be available. The main point about this piece of wood is to have it sturdy enough to be used for attaching tools such as fretwork clamps, or a small metalwork vice.

The rim of beading round the edge of the working surface is well worth installing for a radio enthusiast. It will prevent small parts, or even valuable ones such as valves, from rolling off.

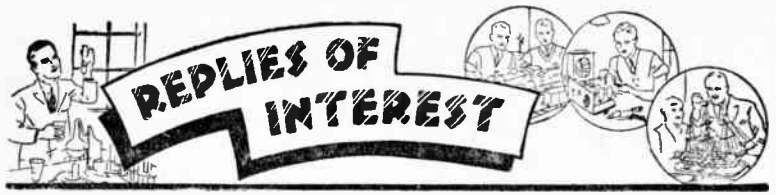
Tool Rests

Items such as soldering iron rests can be attached with screws having the heads well countersunk into the wood on the underside of the working surface. Clips for tools can be attached in this manner, while boxes to contain nuts and bolts are fixed by their bottoms. The advantage of such measures is that after a little quick tool replacement and the removal of the work in hand the working surface can be removed with everything fixed in place, and the whole can be stood at any angle in its storage space.

If the work is to be done on a highly polished table it is necessary to buy and cut into strips about 1in. wide a small amount of baize or felt—2 sq. ft. should be sufficient. The strips can be glued regularly on the undersurface of the working wood and will cut out the risk of scratches caused by sliding wood against wood.

The wood top will not altogether protect the table against excessive heat or hammering. Its installation has been known to make for harmony among newly-weds, and make possible the pursuit of bench work hobbies in otherwise impossible surroundings.

Some people may see in a modified form of this device the ideal way of quickly removing without any disturbance such things as half-completed jigsaw puzzles, children's painting and paste work and plasticine play materials. (131)



Heat-Resisting Surface

I HAVE made a set of circular table mats from 3-ply and wish to place a transfer design on them; then if possible place a glossy finish over this. The problem to overcome is the effect of a hot plate placed on the mat, and what effect it will have on the design and finish. Can you please suggest any successful process to obtain the desired result? (E.D.—Dover).

IT is extremely difficult to attain a really satisfactory glossy surface on wood that will withstand heat. The best way would be to place a disc of glass over the design and bind the edges with passe-partout binding, or preferably with metal foil affixed with a good heat resistant adhesive such as Rawlplug Durafix. Alternatively, a surface built up with several coats of clear cellulose or a transparent synthetic finish such as Walspar, would be most likely to be satisfactory, and could at any time be restored by polishing with the same material.

* * *

Unsatisfactory Starting

I HAVE a ½ h.p. electric motor, single phase, 4·1 amps to drive a small lathe, but upon getting it all fixed up, the motor is not very satisfactory by way of starting. The connections to the motor give a tiny blue flash, and the lights in the house go dim for a few seconds (I ran it from the mains to the shed); then it seems to be O.K. Do you think it is because an ordinary switch is not suitable? If so, what would you suggest, and is it likely to be expensive? Also, do you think it dangerous at all to carry the load outside the house? (J.A.L.—Yiewsley).

THE starting current surge of such motors is frequently high. This may be reduced by allowing the motor to start on as light a load as possible. If practicable, it may be given a spin in the correct direction at the moment of switching on. Such motors are frequently started with a small resistance in one lead; when the motor is running, a further switch is closed cutting out this resistance (the purpose of which is to limit the initial current). A small section of a broken fire-element or an iron-wire spiral may be used. Proper precautions against shocks must, of course, be taken. If the wiring put up is of good quality cable, able to take the current required and properly fitted, no danger should arise. In specific cases there may be clauses in local bye-laws, or in house fire insurance policies limiting the installation of mains-wiring except by skilled persons.

Preserving a Map

I HAVE three home-made maps. The printing is done in ink (fountain pen), pencil crayons and pencils. Can you tell me how to make them shiny like school maps to keep them clean, and how to stop them from getting torn? The paper I used was cartridge drawing paper. (R.J.P.—South Ascot).

THE best way to preserve your maps would be first to coat the face side with clear paper varnish (which can be had from most decorators' shops), but it must be flooded on and not brushed, or the crayon may be disturbed. When dry, moisten the back of the paper and then mount it, by good quality paste, to a fine grade of linen or similar material, but you will have to stretch the paper and pin it down to a board to keep it flat while the paste dries. Finally, give another coat of the paper varnish.

* * *

Soundproofing a Motor

I HAVE tried to make a soundproof box to house an electric motor, but so far without success. Could you tell me a method of constructing one? (A.G.—Finchley).

TO reduce the noise from an electric motor, first mount it on rubber blocks (fairly soft) and secure it by screws or bolts isolated from the motor and from the box by rubber bushes and washers. Next line the whole of the inside walls, floor and top of the box with several layers of corrugated paper, each layer placed with the grooves of one layer at rightangles to that of the next layer. The box should be of material with as non-resonant properties as is practicable, e.g., soft wood, card, building board or the like.

MISCELLANEOUS ADVERTISEMENTS

The advertisements are inserted at the rate of 4d. per word prepaid. Name and address are counted, but initials or groups, such as E.P.S. or £1/11/6 are accepted as one word. Postal Order and Stamps must accompany the order and advertisements will be inserted in the earliest issue. Announcements of fretwork goods or those shown in Hobbies Handbook are not accepted. The charge for use of a Box No. is 1/- extra. Orders can be sent either to Hobbies Weekly, Advert. Dept., Dereham, Norfolk, or Temple House, Tallis St., London, E.C.4

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(*Continued on page 124*)

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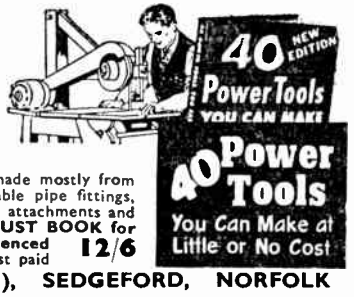

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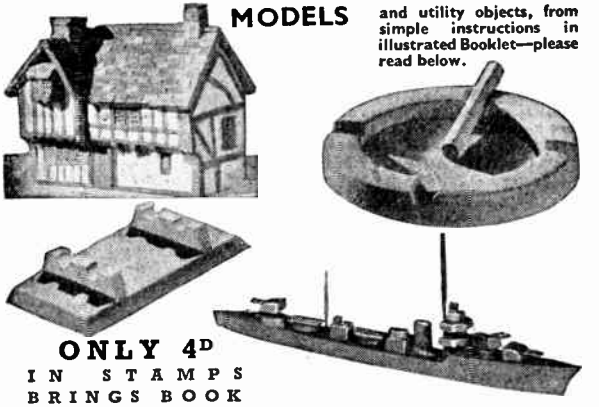

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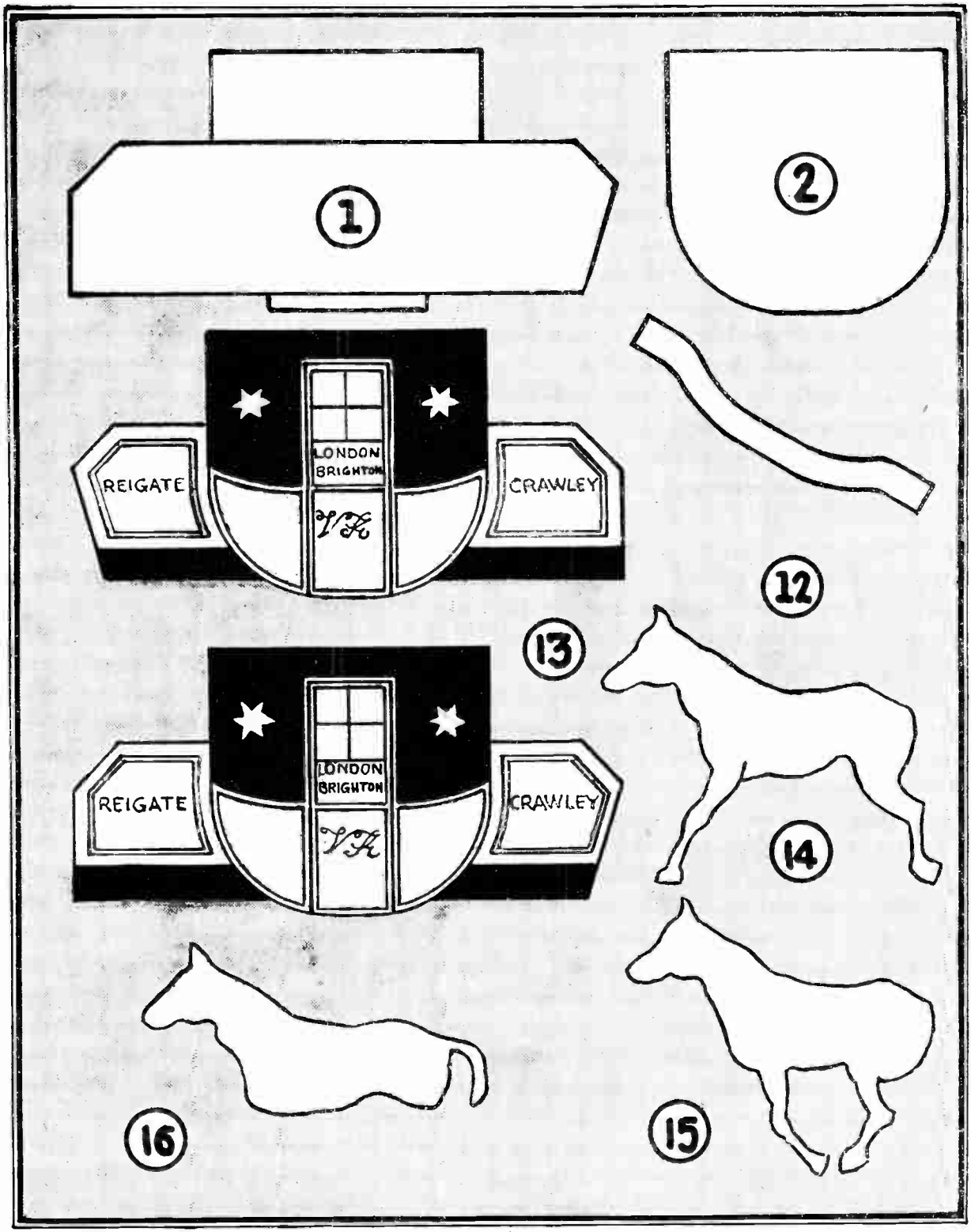

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Hobbies WEEKLY

CONTENTS

November 28th, 1951 Price Fourpence Vol. 113 No. 2926

Help your feathered friends this winter — build them a

SIMPLE BIRD TABLE

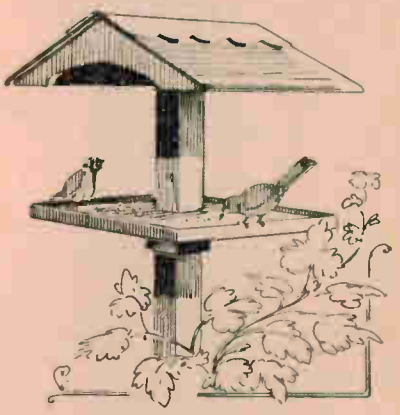


Fig. 1—The completed article

IT is at this time of the year that we think, or should think, about our feathered friends and how they are to be fed during the severe winter weather. When the snow lies thick around it makes for difficulty in getting food to the birds and we should then make them a table upon which crumbs and an odd crust or two of soft bread can be put to keep them alive.

A simple and easily-made table is shown here—one that can be made up cheaply and quickly from some odd pieces of deal and a square of felt or lino as a roof covering.

Spacious 'Deck'

Looking at Fig. 1 we see a spacious and simply-roofed 'deck' with no structural uprights to hinder the free movement of the birds. All the parts of the table are easily pencilled out and cut with an ordinary small household saw, helped in places with the fretframe containing a coarse blade. The general measurements of the table are given in Fig. 2 and here also all the parts are lettered for easy reference when making up. A good stout post, as (A), is the first consideration and it should be about 2½ins. to 3ins. square and should be long enough to go into the ground about 2ft. The top of the post must be cut to the shape shown, both angles being 30 degrees. That portion of the post entering the ground should be well creosoted, and the remainder which includes the roof gable and the edges of the table and the underside of same, given a priming coat and two finishing coats of green paint.

It is, however, quite unnecessary to paint any part of the structure; creosote alone makes a very efficient finish, and most certainly makes for the preservation of all the timber. A fresh coat of creosote should be given at the end of each summer.

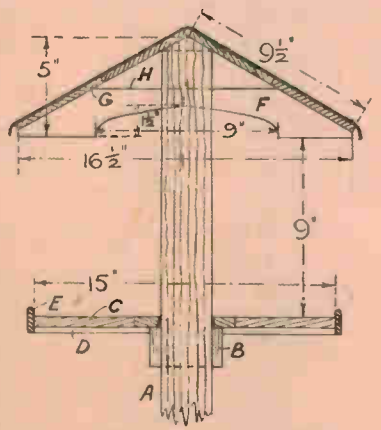


Fig. 2—A drawing giving necessary dimensions

Ram the earth well round the post when fixing it, adding a few small stones to bind all well together. The best fixing for the post is, of course, concrete in the form of a socket into which the post can rest during the winter, and then during the summer and early autumn it may 'air' well in storage and finally receive its coating—foot as well—ready for placing in the concrete base.

Commencing Construction

The construction of the table itself may be commenced by taking in hand its under support, pieces (B) in Fig. 2 and detail Fig. 3. Four squares of wood about ⅛in. thick are nailed to the post at the desired height. That would be from 4ft. to 4ft. 6ins. from ground level to the top edges of the pieces (B). The 'deck' or platform will next be made from three ½in. thick pieces of deal 15ins. long as (C). In one of the pieces a hole to take the post must be cut with the fretsaw as

shown in Fig. 4. Plane the meeting edges of the pieces and clamp them together and nail on the narrow battens (D), consisting of any odd pieces about ⅜in. thick or so to hold all firmly together.

To make a good edging to the platform, nail on four pieces (E) about 1½ins. wide and ⅜in. thick. The ends of these pieces may be just butted together at the

Fig 3—Showing the table supporting pieces

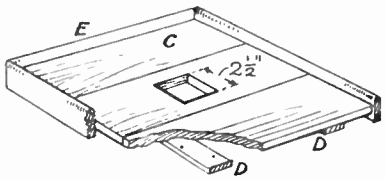


Fig. 4 Details of the table

corners, or they may be mitred, which latter would look better in appearance. Nail the strips on so that they project ⅜in. above and below the ½in. floor, as seen in the cross section Fig. 2. The completed 'deck' is now put over the post and lowered down to rest on its supporting fillets (B).

It should be mentioned that the hole in the 'deck' should nicely fit round the post with little or no side play, so that it roots squarely all round.

The Roof

For this, first obtain two pieces of ½in. wood measuring 16½ins. by 5ins. as (F). Mark across a centre upright line on one piece and from one point set out an angle of 30 degrees each side to form the slope of the roof. Then below, on the straight edge, mark out and cut the simple fret shown, by the aid of the fretsaw. When this is done and the cut edges cleaned off and made smooth, use the piece as a template for marking round to produce the second gable board.

The actual roof slopes consist of four boards 18ins. long by 4¾ins. wide by ⅜in.

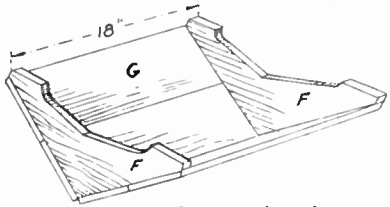


Fig. 5—The roof upturned to show construction

thick. They may be ordinary plain edged boards, or preferably of the grooved and tongued variety which make an excellent and well fitting joint. From the upturned view of the roof Fig. 5 it can be seen how the boards are nailed to the gable boards.

Substantial Fixing

To make a substantial fixing between roof and post, it will be necessary to nail or screw a crossbar to the latter as seen at (H) Fig. 2, the crossbar being 9ins. long by 2ins. wide and about ½in. thick. Cut the bevels of this crossbar to 30 degrees, of course, so that the roof fits it exactly when screwed on. The exact position of the screws may be ascertained by careful measurement along the underside of the roof boarding inside, allowing for the width of post and half width of board (H) to arrive at screw hole positions to be made in the roof boards.

The roof should be placed centrally and should bed down evenly to top of the post and to rail (H). Two screws might also be driven through the roof boards into the sloping faces each side of the post. This would mean that these screws are driven in ¾in. from the top edge of the boards each side. Extra strength is given by the addition of these two screws.

Covering the Roof

It now remains to add the roof covering of felt or lino. The writer has found that a piece of lino tacked all round and then painted two coats, makes an excellent and very durable roof covering. The canvas backing of the lino should be, as usual, placed on the underside, the more-or-less polished surface outside being painted two coats of paint. The size of lino required for the roof is 18½ins. by 21ins., being taken up both slopes and slightly bent downwards at the eaves as seen in the diagram Fig. 2.

Care at the Ridge

The lino at the ridge should be eased to a gentle bend, care being taken not to crack it at this vital point. If desired, a double thickness of lino could be arranged at the ridge and to come about a third of the way down the slopes as depicted in our sketch of the completed bird table. The overlaid ridge piece could, for appearance's sake, be scalloped along its two edges. All lino or felt must be close-nailed and only broad-headed tacks, copper if obtainable, used in all places. If additional fixing is necessary to hold the feeding deck more stable, then chamfered blocks of wood could be nailed to the post on two or four sides, and nails run through the deck into them. (158)

About the care of POND FISH IN WINTER

AS the weather grows colder in winter, the fish in ponds tend to become sluggish. Some species as tench and carp may even try to bury themselves in the bottom deposits. Perch, however, keep more active, and though requiring less food at this time of year, must be fed regularly. In the wild state, fish in ponds seem to be generally inactive in winter. Ponds wherein you see tench and others swimming around freely enough during summer often appear deserted and fishless in the colder months.

Less Food Needed

Fish in the garden pond also need less food, and it is wise at this season not to provide them with more food than they are likely to eat. Excess food left untouched is apt to foul the water in a pond just as in an aquarium. Falling to the bottom, it decomposes and its affects are harmful.

Live foods such as garden worms or red worms, out of the compost heap or old manure, are the best to give them, avoiding the prepared dried foods if possible. Sometimes the trouble is to get the worms in winter, especially in frosty weather, when they go deeper into the soil. A good idea is to fill an old tub with loam or soft soil, mixed with decaying vegetable matter, old leaves and bits of old sacking, with a layer of moss on top. Place the tub, in which you have put a supply of worms, in some suitable and convenient spot—an outhouse or garden shed. By doing so, you can maintain a supply of food during periods when you cannot obtain worms by digging in the garden for them, owing to frost.

Little at a Time

It is advisable to ascertain that the fish are not getting too much food at a time, so that they will be more likely to eat up every scrap. Decaying foodstuff in a pond is more harmful in winter, when plants

(*Continued foot of page* 131)

Now is the time to start making these

LINO BLOCK XMAS CARDS

MY wife and I are bothered with too many friends! We only think this at Christmas time, and then not because they all descend on us and eat us out of house and home. The trouble is that sixty or so Christmas cards are liable to be a heavy item of expenditure.

The problem was finally solved by designing and sending out our own cards, one of which illustrates this article. The cards are easily and cheaply made and have the inestimable advantage of being 'tailor made'.

The First Step

The first step is to buy a good quality writing pad of such dimensions that when a sheet of the paper is folded over the double sheet has the same order of size as the normal Christmas card. One standard size of 7ins. by 5½ins. was found suitable for one design. Otherwise sheets of cartridge paper can be bought and cut to any desired size.

Having got the size of the decorated front page of the Christmas card fixed, the next step is to make a lino block and print off as many copies as are wanted. A piece of plain lino should be glued firmly to a flat wood block and allowed to harden under some heavy weight upon a flat surface. Meanwhile with pencil and paper make a simple frontal design, remembering that a lino block will produce a picture where left on the block will be right on the finished card.

Lino blocks print bold and simple designs best, and indeed it requires a good deal of practice to cut out words in mirror image writing from the lino, so that the design should leave out words. Such words as 'Merry Christmas' or 'Season's Greetings', can be added afterwards with a ball point nib or a script nib — both very cheaply obtainable and made to fit an ordinary pen.

Having decided on the design, trace or draw it on the lino. With a well sharpened penknife blade or even an old safety razor blade, cut the lino away leaving only those parts untouched you wish to come out red, or green, or black, depending on the colour you are going to use for your cards. Be sure to cut deep and you will not be troubled by smudges due to insufficiently cut parts touching inker and paper under the pressure necessary to get an even impression.

Cut the wood of the block close to the edge of the lino on two sides to act as guides for placing down the block during printing. Ready mounted lino blocks can be purchased if desired.

Glossy Printing Inks

It is possible to buy small tubes of glossy printing ink for use with lino blocks. Squeeze out some of the ink on a small sheet of glass. If no roller is available to spread the ink, it can be satisfactorily spread over a sufficient area by a small wad of smooth cloth or old linen around cotton wool. This wad can be used to spread a thin layer directly over the block, though pressing down the block on the layer on the glass may be found the better idea unless you have had some practice. The great thing to avoid is too much ink—the blocks will print with unsightly raised edges of liquid colour if too much ink is used.

When the block is ready make a few trial impressions on newspaper. Then put a few old newspapers under the sheet of paper you are going to use as a Christmas card, to give a little resilience to the work. Put down the guide edges in such a position as to print the picture centrally, then apply firm pressure, rocking the block slightly if you have any suspicion that it is not absolutely plane.

Even if the first one or two sheets are spoilt on one account or another a fine clear impression should result in a few tries. Leave the pages to dry thoroughly. Print with your special nib and red ink a greeting you like on the front page. Inside your name and address and any other words you may wish to add can be written, or preferably typed.

These Christmas cards can be thoroughly individual, in a way no shop product ever can be, and they are a quarter of the cost of the impersonal shop article. (135)

Pond Fish in Winter—(*Continued from page* 130)

are more or less inactive, and do little to purify the water.

Pond fish take little harm if properly fed, and fish kept in good condition are more likely to survive colder periods than poorly nourished ones. Provided a part of the pond is of a fair depth, say 18ins. or so, to which the fish can retire if the water freezes over, they will be safe enough. These remarks, of course, refer only to hardy cold-water species.

Bring them Indoors

If your pond is shallow or you desire to have a few fish indoors for the pleasure of watching them, then bring them—or some, at any rate—in to your aquarium, if you have one. If not, set one up. It will provide you with continual interest. The aquarium is a grand indoor hobby when outdoor activities are curtailed.

It is better to transfer the fish from pond to tank before the weather becomes too severe, and it is a good idea to use water from the pond, providing a fairly generous allowance for each fish, according to requirement, depending upon size of fish. It is desirable to see that there is little or no change in the water temperature. Unless you have a very large aquarium in proportion to the number and size of the fish, aeration will be needed. Never overcrowd your tank. If the latter is well provided with plants, the aeration can be reduced in time, and perhaps done away with altogether.

Clear Dead Leaves

Garden ponds near trees or with bushes overhanging should be cleared of the dead leaves that accumulate in the autumn, and are rotting on the bottom, fouling the water.

Remember, it is not necessary to move fish from a pond for the winter, if it is of a nice depth, 18 ins. to 2 ft., as they should do well enough in spite of water freezing. It is only in very shallow ponds where there is a risk of the water freezing solid that it is dangerous to leave them. (120)

This is an easily made

CONTACT PRINTING DEVICE

THOUGH quite a number of amateur photographers develop their own films (usually in a tank), a far lower number seem to do their own contact printing, though this is worthwhile, apart from the interest provided, in view of the very low cost of contact papers, and the ease with which prints can be made. The device shown here was arranged so that construction is of the simplest form. Few materials are required; none of the dimensions are critical, and the whole can be made up in a very short time.

How the Printer Operates

Fig. 1 shows a side view of the device. No dark-room is required if printing is done after the hours of daylight. This will be from about 6 p.m. onwards during the winter months, and about 8 to 9 p.m. during spring and autumn. During mid-summer some means of darkening the room is desirable—thick curtains will do. Complete darkness is by no means necessary, contact papers being comparatively insensitive. Alternatively, the prints may be left until darker evenings come.

When the adapter is plugged into the ceiling or other lamp-holder, the 'safelight' comes on. This lamp may be red or orange, the latter being easier to work by. Such coloured lamps may be obtained from photographic dealers. The switch turns the pearl lamp on, and is operated so as to give the correct exposure to the paper in the printing frame, which is placed behind the negative being copied, in the usual way.

Distance pieces assure that the frame is always at the same distance from the lamp, thus providing uniform results. For average negatives, the centre piece is used. With dense negatives the frame may be moved up to the piece nearest the lamp. But if thin negatives are printed, the frame is placed at the end of the base, against the last distance piece, so that the exposure does not become so short that its accurate measurement is difficult.

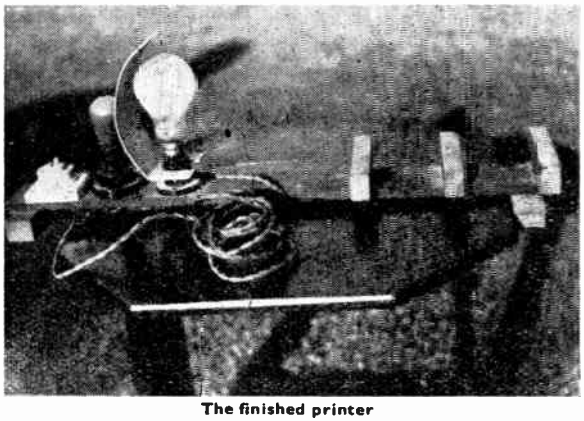
Construction and Wiring

The wooden pieces may be screwed or nailed together. Holes are drilled where the two batten-type lamp holders are situated, so that the wires can pass through. This is also done for the switch, and these items are wired as shown in Fig. 2. After attaching the wires, screw the holders and switch down. Fitting an adapter to the flex completes this part of the work.

The reflector is made from a curved piece of aluminium, slotted and held by the retaining ring of the lamp holder. Any ordinary bulb of 60 watt or so rating is used here. Two strips are secured under the base so that the whole can stand level on a table.

The exposure to be given will vary from two or three seconds upwards, according to the density of the negative and the type of printing paper. It can best be measured by placing a watch or clock with second hand near the switch.

If the user has had no experience of contact printing, a test print can be made as follows. Place the negative in the frame, emulsion side to the back, and lay the contact paper with glossy side against the negative. Now secure the back of the frame in place with the clip provided, and rest the frame against the centre distance piece. Take a piece of cardboard large enough to cover the frame, shield it from the lamp with this, and switch on. Now begin to count seconds, moving the card sideways off the frame about $\frac{1}{2}$in. or so after each two seconds counted. Immediately the whole negative is exposed, switch off the lamp.



The finished printer

The paper is now developed by the red light, and will consist of strips each given a different exposure, in two second steps. (E.g.—the total exposure will have been for two seconds with the final strip, four seconds with the next, six seconds with the next, and so on). It will then be seen which is best, and a full-sized print can be made at that exposure. Similar negatives can be given the same exposure.

After a few trials no difficulty will arise in exposing at a suitable length of time right away, especially if negatives are classified as 'dense', 'medium' and 'thin', and the times noted. Further prints can then be made at a future date, if needed, without difficulty. (490)

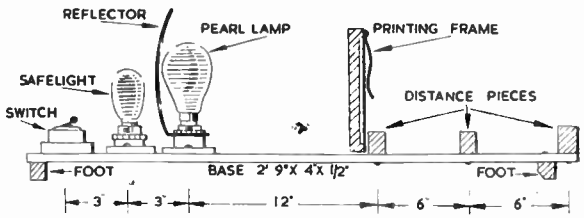


Fig. 1—Side view with dimensions

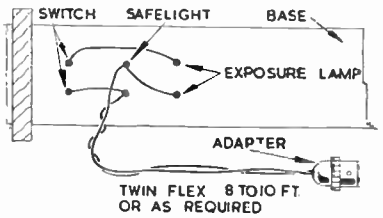


Fig. 2—Underneath view of wiring

TRACTOR AND TRAILER

The necessary materials for making the toy Tractor and Trailer from this week's free Design (No. 2926), including wood, round rod and 3in. and 1¼in. wheels, can be obtained from Hobbies Branches or post free from Hobbies Ltd., Dereham, Norfolk, price 6/4 including tax.

Here we tell you how to have

SOME FUN WITH LIGHT

IT is only during the last 100 years that scientists have begun to understand the nature of light. The Greeks believed light to be something sent out by the eye to illuminate objects, and Sir Isaac Newton regarded light as a stream of solid particles.

The present theory is that light travels in the form of waves, like wireless waves. Some of these waves enter the eye directly (from a lamp or the sun) and others are reflected from objects, enabling us to see them.

A beam of light is a large number of straight lines, a fact easily verified by experiment.

First Experiment

Cut three pieces of card about 4ins. square and make a small hole through the centre of each. Set the cards upright, one behind the other with the holes in line and look through them at a light source (Fig. 1). If one of the cards is displaced the light is immediately cut off, proving that no beam can bend.

It is possible to make the light change direction by means of mirrors. For the following model periscope a stout piece of card is required, 12ins. by 6ins. Mirrors can be bought quite cheaply though the ones used by the writer were discarded pieces from a local glazier.

When cutting glass with a diamond or a wheel try to make the scratch in one sweep. Mark to size on the back in pencil, hold a straightedge against the line and firmly draw the cutter towards you. A slight tap on the scratched mirror should break it cleanly.

Copy the dimensions given on to the card. Score the lines of folding and cut the outline with a straightedge and a sharp knife. It is better to keep greater pressure on the straightedge to avoid slipping, and draw the knife down the line several times.

Cut out the mirror slits and the two windows. (A single edged razor blade comes in useful here) and bend to shape. Push the mirrors into their slots with the reflecting surface towards the window and glue. Fitting the mirrors before gluing helps to keep the box square and avoids distortion afterwards. A couple of elastic bands will keep the joints tight until dry.

This device, when completed, will enable you to see around corners and over the heads of the crowd. It was used during the war for Artillery observation and, of course, in submarines. A machine-made instrument usually has a number of lenses incorporated to make the picture larger and more distinct.

The reflection of light can also be used to form many ingenious patterns by means of the kaleidoscope. For this, two mirrors about 4ins. by 1in. are needed, a piece of card 3ins. by ¼in. and some adhesive tape.

Put the mirrors and card together to form a triangle with the reflecting surfaces inward so that at one end card and mirrors are level. Bind with tape to fasten securely. If they tend to slip together small pieces of card can be inserted until after binding, and then removed.

Now cut a number of very small shapes from coloured paper, stand the instrument on white paper with the light gap at the bottom and push the coloured pieces through the gap. Looking through the top an amazing pattern can be seen, and by moving the coloured papers it will change without limit.

A strange phenomena of light is known as refraction. Hold a stick in a bowl of clear water so that part of its length is above the surface. The stick is apparently bent.

There is a simple explanation of this.

(*Continued foot of page* 134)

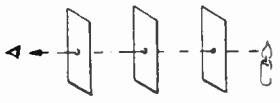


Fig. 1—Experiment with cards

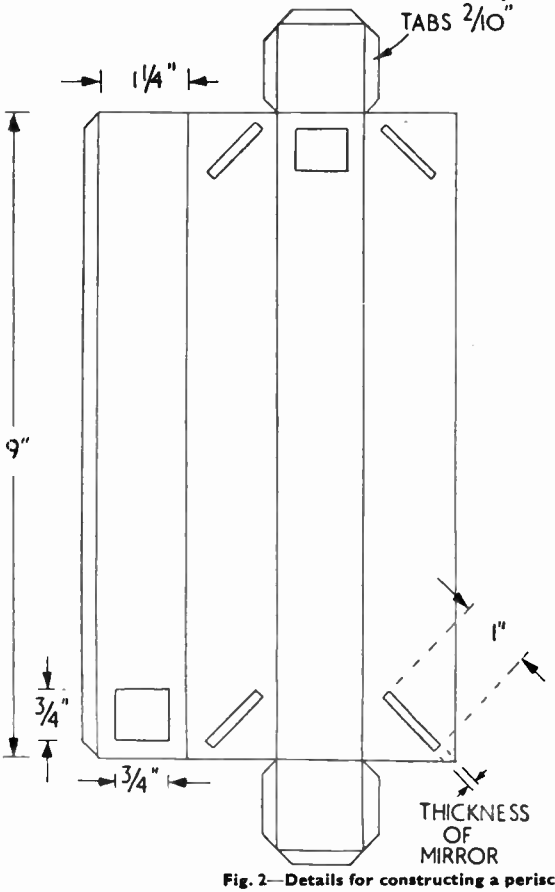


Fig. 2—Details for constructing a periscope

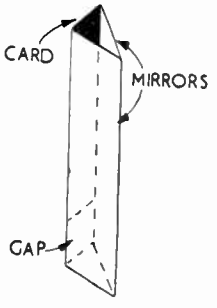
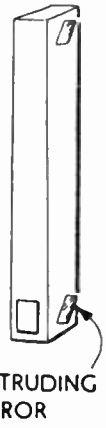


Fig. 3 — Making a kaleidoscope

Fig. 4—Experiment with refraction



For the home workshop—

A USEFUL WHEEL-MAKER

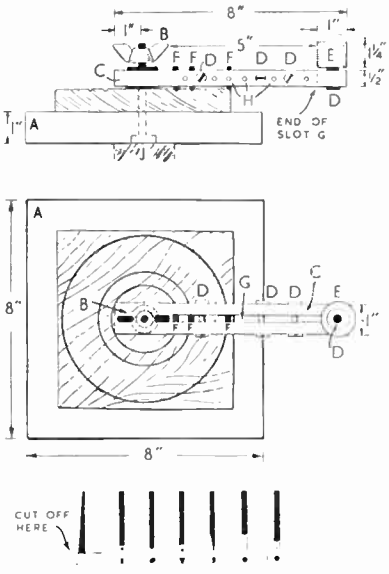
ALTHOUGH this is a machine which can be made in an hour or so from materials usually found in the amateur's workshop, it is capable of turning out great quantities of really accurate work in double quick time. It is certainly not fussy as to the materials with which it will work—and wood, plastics, tinplate and aluminium sheet can be 'disced' with equal ease.

The design has been developed to make more easy the construction of wheels and other similar disc-like structures, but its utility does not end there by any means. Indeed, the range of its uses is particularly wide and it will be found a useful accessory for cutting holes to accommodate valve-holders and other components in wireless receiver chassis and for cutting large circular holes for a variety of other purposes. It is not designed for working with steel or other 'hard' metals.

Construction

This is clear from the diagram and calls for little comment except to say that care should be taken to make sure that the bolt (B) is fitted upright and true in all directions to the base-board (A). Any lopsided tendency in this connection will cause endless trouble when the machine is in use, and care taken here will be well repaid.

The slot (G) is a saw-cut. It should be upright throughout its length and be widened with a flat file to $\frac{1}{8}$in. width. (H-H) are $\frac{1}{8}$in. diameter holes drilled at $\frac{1}{2}$in. intervals to accommodate the tightening bolts (D.D.).



These drawings give all the necessary constructional details

It may be found convenient to fasten, to the underside of the baseboard, a block (J) by which the machine can be secured in a vice. The position of the block will, of course, depend on the vice used and the position of it in relation to the bench.

PART LIST

Letter	Part	No.	Size
A	Baseboard*	1	8" ×8" ×1"
B	Bolt (with butterfly nut and washers to fit)	1	3" × $\frac{3}{16}$" dia.
C	Cutter bar*	1	8" ×1" ×$\frac{1}{2}$"
D	Bolts (with nuts and washers to fit) ...	4	1$\frac{1}{2}$" ×$\frac{3}{16}$" dia.
E	Cotton reel	1	1$\frac{1}{4}$" ×1" dia.
F	Cutters (french nails)	6	2$\frac{1}{2}$"

* Hardwood for preference.

Cutting Tools

These are made from 2$\frac{1}{2}$in. french nails filed to shape and sharpened. Shaping depends to some extent on the type of work the reader has in mind, but the diagram shows a selection of shapes which it is hoped will prove of general utility.

Use

The method of using the machine is simplicity itself. Remove the wing-nut and cutter bar (C) and place the piece of wood or other material from which the wheel is to be made into position over the bolt (B): the wood or other material being drilled to clear $\frac{3}{16}$in., the diameter of the bolt. Next set up the cutter bar. This is done by inserting at suitable radii positions the cutting tools required for the job in hand and tightening the bolts (D) along the cutter bar.

In the diagram, a wheel for a child's toy is shown. Here three cutters are used, one at 1$\frac{1}{2}$in. radius for cutting the outside circumference of the wheel, and two at lesser radii for engraving some ornamental rings. The cutting tool for the circumference is set with a cutting depth equal to half the thickness of the material used for making the wheel, the setting of the other cutters is dependent on the depth desired for the ornamental rings.

When the cutter bar is set up it should be placed in position with its washers on either side and the wing nut adjusted to give an easy turning fit. The cutter bar is then turned by the handle (E) until the outside cutter is halfway through the material. The material is then turned over and the process repeated from the other side. The process of stopping and turning the work over may seem somewhat irksome, but generally speaking, a much better wheel results and amply justifies the additional work involved.

The machine shown in the diagram is able to make wheels (or discs, or holes, for that matter) up to 5ins. diameter in material up to $\frac{3}{4}$in. thickness. Larger capacities can, of course, be achieved by increasing the sizes of the base-board (A) and the cutter bar (C) respectively. (139)

Fun with Light—(*Continued from page* 133)

A man can run around a swimming pool at speed, but if he jumps into the water he is immediately slowed down. If his feet touch the water first they will be slowed first and he falls forward. The same applies to light. The nearest edge of a beam on striking water is slowed whilst the farthest edge is still moving at speed (186,000 miles per second!) Consequently the light 'bends'.

If the light hits the water vertically both edges are slowed together and no bending takes place. Try it with the stick and see.

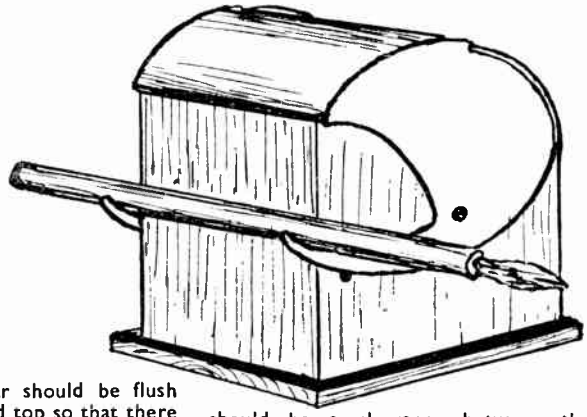
Refraction can be demonstrated in another way. Place a small coin (farthing or sixpence) in a cup. Now lower your head so that only the edge of the coin can be seen above the edge of the cup. Have someone gently pour water into the cup whilst you keep your head still. The coin will gradually rise into view as the water 'bends' the light.

Finally here is a game which depends upon refraction. For this you need the same coin and a glass dish—a transparent heatproof dish is excellent; but it must have clear sides. Fill the dish with water and look through the side into the water. Drop in the coin, still looking only through the water, and then try to put your finger *quickly* on to the coin. It is not where it seems to be.

The secret lies in watching your finger as much as the coin for whatever the water does to the coin it will do to your finger also.

By the way, it is prudent to try this where spilt water is of no consequence. It is surprising how involving the game can be. (457)

Just right for the forgetful is this
AUTOMATIC INK STAND



INK is a substance which needs to be kept covered up when not in use. It is very liable to evaporation and in a warm room this can be quite rapid. Dust is also an enemy of the open ink well, and for these two reasons it is necessary to keep the ink well closed whenever possible.

It frequently happens that we forget to do this simple job, or perhaps, it is too much trouble.

Simple Action

The automatic ink stand described in this article was designed for the forgetful person as the simple action of putting down the pen closes the lid and keeps the ink in good condition.

Fig. 1 clearly shows how the ink jar is automatically closed. The lid (A) which is made of sheet metal is pivoted at (B) and is shown covering the jar. When the pen is lifted off the curved lever (C) the cover (A) swings back clear of the jar opening due to the extra weight of the counterpoise (D). Replacing the pen again closes the ink jar and keeps the contents in good condition.

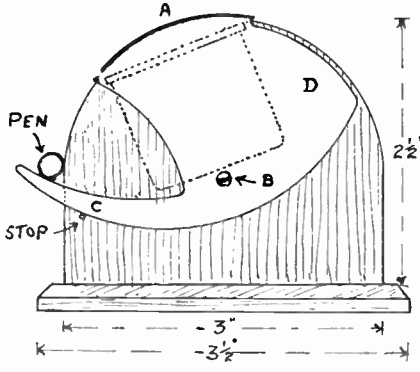


Fig. 1

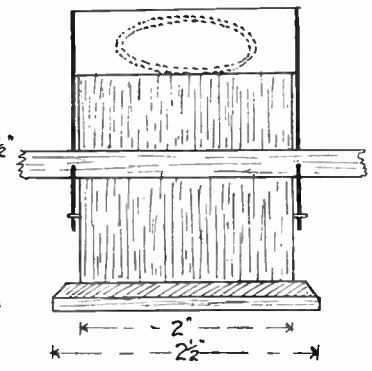


Fig. 2

Actual sizes cannot be given as this will depend on the size of the ink jar and also on the size and weight of the pen. The approximate measurements which are shown can be adjusted to suit your individual requirements.

We will suppose that you have found a nice little glass jar about 1in. diameter and approximately the same height. One of those very small potted meat jars would serve the purpose very nicely and they are quite easy to obtain now.

A block of hardwood is the best material to use as a holder for the ink ar. A piece of oak or walnut 2½ins. long, 3ins. wide and 2ins. deep will be about the right size for the very small jars. The top as shown in Fig. 1 is cut to form a perfect half circle with a radius of 1½ins. and the jar is let in at approximately the position shown. The exact position is not very important, but the mechanism works best at the position shown in the drawing.

The rim of the jar should be flush with the curved wood top so that there are no projections to catch on the lid as it swings to and fro.

A base cut from ¼in. wood 3½ins. long and 2½ins. wide can now be glued and tacked on—it can be bevelled off as shown or left quite plain.

This completes the wood work and it can now be glasspapered, stained and finished off as desired. Any of the usual polishes are quite suitable or it may be varnished or painted.

The remainder of the ink stand can be made of some kind of sheet metal. Brass or copper would look nice and be very suitable. Gauge 18 or 20 S.W.G. is about the thickness to use and this can be cut with shears or with a metal fretsaw.

The lid is about 2½ins. long and wide enough to cover the jar and overlap just a little on each side. Bend it into a neat curve to exactly fit the top of the wood block. Two side pieces are cut to the approximate shape as shown in Fig. 1. Drill the pivot holes (B) and then carefully solder on the lid (A). There should be a clearance between the inside of the lid and the top of the wood block of about $\frac{1}{16}$in.

There should also be a slight space between the side pieces and the wood block—a little less than $\frac{1}{16}$in. would be plenty provided the sides are nice and flat.

The counterpoise part of the two sides may have to be altered somewhat, and the weight of the pen will decide this for you. First carefully work out the position for the pivot screws (B) and then screw them in place so that the lid swings perfectly free. Use thin ½in. roundheaded screws for the pivots and do not screw them in too tight.

Place the pen on the projecting arms (C) and see if the lid closes easily. If it does not move then the part marked (D) is too heavy and a little must be cut away until it just swings over.

It is possible that the counterpoise (D) is not heavy enough to open the lid when the pen is removed. Should this occur then a small piece of metal can be soldered on to the end to make the weight right.

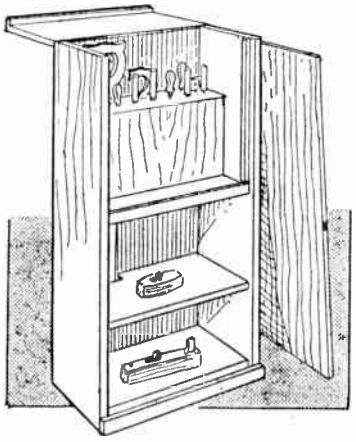
A stop must be fitted as shown to keep the lid from closing over too far, and a small panel pin will do for this. A stop can also be fitted to keep the lid from opening too far the other way if this is necessary.

In order to keep the metal work from tarnishing after it has been polished with fine emery cloth it can be given a coat of lacquer. Old gold shade would tone well with the woodwork and make a nice finish to the job.

Instead of staining, polishing and lacquering, the entire article can be painted with a coat of cellulose enamel now obtainable in a wide range of colours. Two coats may be needed to cover well and be sure to allow the first to dry well before applying the next. (156)

For the home craftsman's den—

A HANDY TOOL RACK



FOR woodworkers generally, the tool rack shown is a useful accessory, as it houses most of the tools necessary for the work. It is provided with a shutter to keep out the dust, inseparable from the workroom, and is so designed that the tools in most common use are to hand. Another point worthy of mention, is the cover over sharp-edged tools, chisels, for example. This protects the hands from danger of a cut.

A front and side section are given in Fig. 1. Good quality deal is quite suitable for making the tool rack, and as a substantial article is desirable, wood of $\frac{7}{8}$in. thickness is recommended for the construction. Wood of lighter thickness can be used if the thicker stuff is not available, but, of course, a less robust piece of work will result.

Cut the sides first, then at the distances given in the side section, square lines across to indicate where the shelves will come, double lines for each, $\frac{7}{8}$in. apart, or less if the thinner wood is chosen. On these lines screw $\frac{1}{2}$in. by 1in. battens for the shelves to rest upon, except at the bottom, where $\frac{3}{4}$in. by 1in. battens are fixed. Note here the short battens for the top and middle shelves, and also that the battens for the middle and bottom shelves are $\frac{1}{4}$in. short of the front edge, to leave room for the shutter, which in the sectional view is shown in position. Now cut all shelves to the widths shown.

CUTTING LIST

Sides of rack—3ft. by 9ins. by $\frac{7}{8}$in.
Top shelf—1ft. 6ins. by 4ins. by $\frac{7}{8}$in.
Middle shelf—1ft. 6ins. by 4$\frac{1}{2}$ins. by $\frac{7}{8}$in.
Bottom shelf—1ft. 6ins. by 8$\frac{3}{4}$ins. by $\frac{7}{8}$in.
Rack bottom—1ft. 6ins. by 8$\frac{3}{4}$ins. by $\frac{7}{8}$in.
Lid—1ft. 7$\frac{1}{2}$ins. by 9$\frac{1}{2}$ins. by $\frac{7}{8}$in.
Back—3ft. by 1ft. 7$\frac{1}{2}$ins. by $\frac{1}{4}$in. ply.
Shutter—2ft. 11ins. by 1ft. 6ins. by $\frac{1}{4}$in. ply.
Vertical cover to shelves—1ft. 6ins. by 10ins. by $\frac{1}{4}$in. ply.

Remainder from spare wood.

The Top Shelf

The top shelf holds hand and tenon saws, chisels, gouges, and such other small tools as room can be found for. A plan of this is given in Fig. 2, the slots and holes being cut to suit the tools. Owing to the extra length of the handsaw it will extend nearly to the bottom of the rack, so in the bottom shelf, a piece should be sawn out, as in the drawing, Fig. 2, to let it pass. First screw the top shelf and bottom of the rack to their respective battens, then nail the other two across. A piece of plywood is then cut to size, and nailed to the front edge of the top shelf and rear edge of the middle shelf, to shield the edges of the chisels, etc. A back of plywood nailed over will complete the carcase.

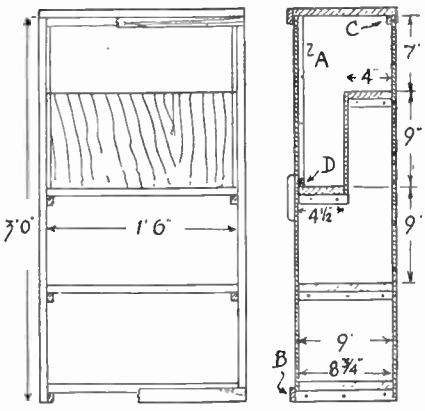


Fig. 1

A shutter, also of $\frac{1}{4}$in. plywood, is now cut. This should rest upon the ends of the bottom batten, and reach to the top of the rack. From the middle shelf to the top, a strip of wood, $\frac{1}{4}$in. thick and $\frac{3}{4}$in. wide is nailed each side, as at (A) and should butt against the shutter, to help exclude dust. At the bottom a $\frac{1}{2}$in. by 1$\frac{1}{2}$in. strip of wood (B) is nailed across the front to keep the shutter in place. At back (C) a strip is nailed and glued across, say, $\frac{3}{8}$in. by 1in. to thicken the plywood back to hold the screws of the hinged lid better. A small piece of wood, say, 1in. wide and 4ins. long, is glued and screwed to the centre of the shutter, as a handle.

Fig. 3 shows a detail to make the fitting of the shutter quite clear. From this it will be seen that the shutter slips in at the bottom between the space between the bottom of the tool rack, and strip (B), and at the top is retained in position by a flange nailed to the edge of the lid. A final point to complete this part of the work is to glue and nail a narrow strip of wood, say, $\frac{1}{4}$in. thick and $\frac{3}{8}$in. wide, against the edge of the middle shelf (D), making the latter a tray for holding such small items as cannot conveniently be located elsewhere. Files, fretsaws, etc., will come here, also pencil and marking knife, perhaps.

The Lid

The lid is cut to cover the top of the rack, including, of course, the plywood back. The front edge should then be truly level with the rest. It is hinged at the rear, the screws going through the plywood into the thickening strip (C). To the front edge of the lid a $\frac{1}{2}$in. by 1$\frac{1}{2}$in. strip of wood is nailed across to keep the shutter in place.

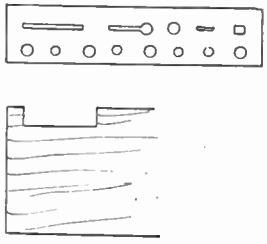


Fig. 2

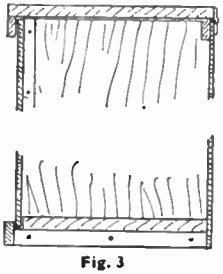


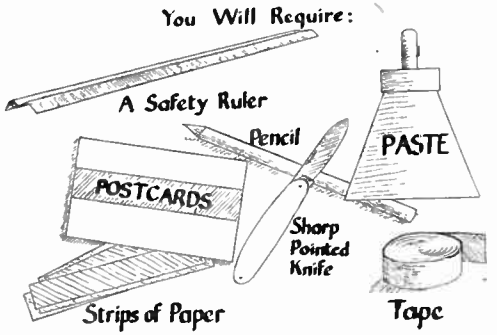
Fig. 3

The work should now be cleaned up with glasspaper. The inside can be left plain, but the outside will look and wear better if given a coat or two of varnish. A light stain could be applied first to improve the whole. (153)

For the philatelist—how to

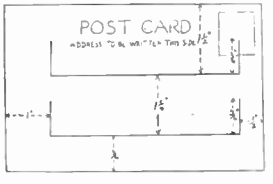
MAKE A STAMP STOCK BOOK

MOST of the articles required to make this stamp container are already available in your home, but you *must* have a safety ruler along which to make your cuts. The all-metal type with a groove for your fingers is most reliable, and cheap too.



You also need postcards, remembering that two cards will be pasted back to back to make one page. They can be stuck with either paste or gum. Your penknife must be sharp at the point if you are to cut clean lines, and your pencil should be fairly sharp, too.

The best paper to cut into strips to make the fronts of the stamp pockets is ordinary 'greaseproof', and the tape for hinging two pages together can be sewing tape, about 1in. wide, which is



Marking out

most suitable, or surgical tape, or even gummed paper, though this is not so durable as fabric.

Finally, if you are to keep your sharp knife off mother's polished table, you need a board to do the cutting on. It can be thick cardboard, the harder the better or a sheet of zinc or plate glass. If you try to cut on a soft surface, the edges of the cut will be ragged.

Marking out the Postcards

Each card will eventually have two pockets, each 4ins. by ⅜in., on its plain side, so measure and mark out the lines on the printed side of the card, as in the diagram.

The larger margin on the left of the card in the diagram leaves space for the hinge to be inserted, so that the card which is to be pasted to the one shown must have its larger margin on the RIGHT.

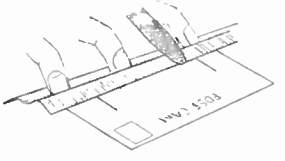
Cutting the Lines

See that the safety ruler is right against the line to be cut, and that card and ruler are flat on the cutting board. The fingers of your left hand, in the groove of the rule, are holding it firmly, while your right hand, holding the knife, places the point of the blade on the line.

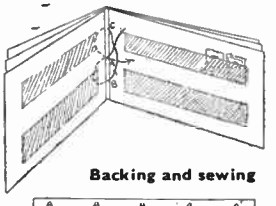
With an even stroke and steady pressure, the knife is drawn along the ruler from one end of the line to the other, the point of the knife serving to finish the cut cleanly at the corners.

Cutting the Strips

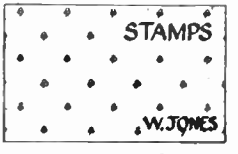
The finished pockets will be 4ins. by ⅜in., but the strips must overlap this behind the card by ¼in. at each end and at the bottom. Your strips of greaseproof paper, then, will be 4½ins. by 1in. Using your ruler, knife, and cutting board, and cutting through six thicknesses at once, you will quickly produce enough of these strips. Remember that you require only four strips for each pair of postcards.



Cutting



Backing and sewing



The finished book

Inserting the Strips

Each card now has two shallow flaps. Still keeping them plain side downwards, lift up slightly each of these flaps and push a strip as far under as it will go. When the top edge of the strip has reached the limits of the short cuts at the ends of the flap, make sure that it is flat and that the margins of paper protruding round the flap are all ¼in. wide, as in the diagram. Push the flap down again into its original cut.

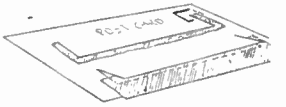
Preparing the Hinges

Your hinges will be the width of the card (3½ins.), and about 1in. wide, and you will need one hinge for each four postcards. Cut your roll of tape into the required number of hinges, making them just over 3½ins. long so that they can be trimmed afterwards. Fold each hinge down the centre, and on each side of the fold draw a line ⅛in. away from it. You then have two lines, ¼in. apart.

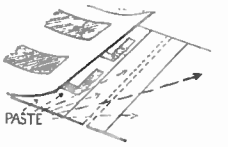
Pasting the Pages

Lay a pair of cards, plain side downwards, on the table. Make sure the wide margins on both are towards the middle, and that their ends are ¼in. apart. Quickly paste the wide margin of both cards, put the hinge in place, and briefly and firmly press down the tape.

Quickly and lightly paste over the



Inserting the strips



Pasting the pages and fastening the hinges

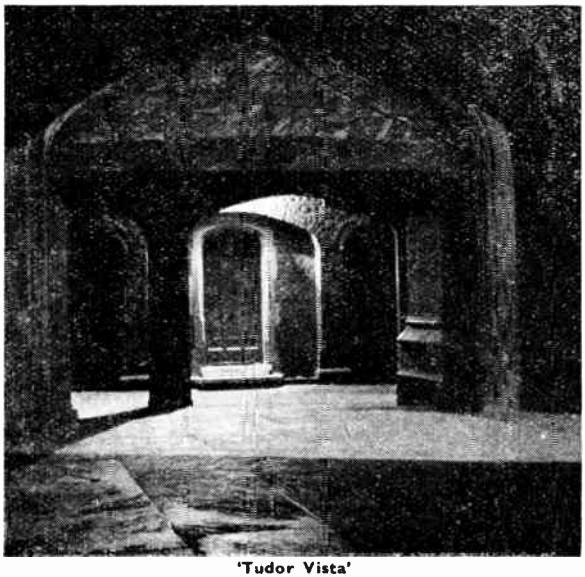
whole of the two cards and the attached hinge, then carefully place the second pair of cards exactly on top of the pasted ones, plain side UPPERMOST this time, but still with the wide margins towards the centre. Press down quickly, then lay the two pages out flat, away from your working space, and pile above them the heaviest books you can find.

Pressing

As you complete each pair of pages,

(*Continued foot of page* 138)

Here is how to take
CAMERA STUDIES BY NIGHT



'Tudor Vista'

ARE you one of those photographers who only use a camera during the daylight hours of summer? Why not try some night shots during the dark evenings this winter? It is great fun.

Most towns and cities possess a few old buildings at least, or some secluded quarter associated with a bygone age, and where gaslight here and there breaks the gloom. The old carved stone doorway of a church or cathedral, an antique shop front, the intricate pattern of a wrought iron gate seen against the light, a narrow winding alley with enchanting reflections on the wet pavement—all these and scores more offer tempting pictures if there is a street lamp suitably placed to illuminate and isolate the subject from the surrounding darkness.

The lights themselves would show as irritating fuzzy white blobs in the finished picture, so try to arrange your viewpoint to conceal them behind the corner of a building or a tree-trunk or a stone column, yet so that they still cast their light on the scene to be photographed. Taken like this, night pictures capture an appealing atmosphere of romance and mystery in subjects which may seem very ordinary by daylight.

Any Camera

Any camera is suitable, if it will give a 'time' exposure—that is, if the shutter can be made to open completely and remain open until you close it again. If you are becoming keen on photography, a tripod is a very useful investment, for you can then adjust your viewpoint to a nicety. Lacking this will mean placing the camera on a convenient ledge or post, or holding it firmly flat up against a wall while you open and close the shutter for the exposure. To avoid a blurred picture the camera must not be moved during exposure, even the smallest fraction of an inch. Passing vehicles or people may produce streaks, too, unless you cover the lens with your hand or hat until they are out of the field of view. Oh, and—I nearly forgot—you will need a watch, some warm clothing and a patient attitude towards curious passers-by!

Length of Exposure

No doubt you will be wondering how long an exposure you ought to give? Experience soon comes if you keep a careful record of all your exposure times. Ask your dealer for panchromatic film, which is very sensitive to artificial light and make your exposures somewhere in the range of 2—10 minutes at *f*/11, according to the brightness of the subject. This is about right for a box camera, too. So—good hunting! (163)

'Cloistered Silence'

Stamp Stock Book—(*Continued from page* 137)

place them directly on top of the earlier ones, and reload them with the heavy books. They must be left to press and dry like this for at least twelve hours.

Backing and Sewing

Rather than waste a pair of uncut cards for the front and back covers, only the outside cards need be left whole, and the inside of each cover will then have two long stamp pockets like the other pages.

When this pair of covers, hinged like the rest, has been pressed and dried overnight, it can be covered with any thin, brightly patterned material.

The covers will measure 11¼ins. by 3¼ins., so your material needs to be a little larger. Lay out the covers, quickly and *sparingly* paste over them, cover with the cloth, and again press under books.

When all the pages are firm and dry, they are folded ready for sewing into book form. Using an ordinary needle and strong thread, the first stitch is made through the centre of the hinges (A in the diagram), and the thread is drawn through until about 2ins. remain inside the book. The needle is brought back through (B) (1in. below A), and taken along the centre of the hinge to (C) (1in. above A), where it goes out through the hinges again. It comes back through (A). There are now two ends of thread coming through (A) in the middle of the book, and the thread passing from (B) to (C) go between them. Tie the two ends at (A) in a secure knot over the (B) to (C) piece; trim the ends, and the book is sewn.

Trim the material on the back down to the edges of the cover with some *sharp* scissors, and if the pages of your book have not turned out quite level, they will require trimming with the safety rule and knife.

Title the cover in drawing ink, put your name on it and use the finished stock book for your 'swaps'. (125)

COMPOSERS ON STAMPS

MANY countries have honoured composers on their stamps and, consequently, many stamp collectors have adopted this subject as the basis for a thematic collection.

Ludwig van Beethoven (1770-1827), composer of nine symphonies, thirty-two solo pianoforte concertos and many other works, was born at Bonn, Germany. Beethoven spent much of his life in Vienna, where he studied under Mozart. In later years, he was handicapped by deafness. Portraits of Beethoven appear on the Germany 1926 8pf. and 20pf., and on the Austria 1922 Needy Musicians' Charity 7½k.

Child Genius

Wolfgang Amadeus Chrysostom Mozart (1756-1791) was born at Salzburg, Austria. He was a child genius, composing music at four and playing the piano on tour at six. Mozart settled in Vienna and died there of a malignant fever, being buried in a pauper's grave. His operas include 'Cosi fan Tutti', 'The Marriage of Figaro', 'Don Giovanni', and 'The Magic Flute'. Portraits of Mozart appear on the Austria 1922 Charity 5k. and on the Germany and Bohemia and Moravia stamps issued on the 150th Anniversary of his death.

Johann Sebastian Bach (1685-1750) was born at Eisenach, Saxony. He became an organist and spent most of his life in Leipzig, where he died. Bach produced many compositions, including the Mass in B Minor, the Passions of St. Matthew and St. John, and over 200 cantatas. His portrait appears on the Germany 1926 50pf. and the 1935 Musicians' Anniversaries 12pf. In 1950 the Anglo-American Zones issued two stamps bearing Bach's Seal to commemorate the 200th Anniversary of his death.

Richard Wagner (1813-1883) was born at Leipzig, lived for some time at Bayreuth and died in Venice. He composed many operas and scenes from 'Tannhauser', 'The Flying Dutchman', 'Rhinegold', 'The Mastersinger', 'The Valkyries', 'Tristan and Isolde', 'Siegfried', 'Lohengrin', and 'Parsifal' are shown on the Germany 1933 Charity issue. In 1943 Bohemia and Moravia issued three stamps commemorating the 130th Anniversary of his birth. One of these stamps bears Wagner's portrait, another a scene from 'The Mastersinger', and the third the Blacksmith scene from 'Siegfried'.

Frédéric François Chopin (1810-1849) was born at Warsaw, settled in Paris, where he became a lover of George Sand, and died of consumption in Paris. Chopin was a wonderful pianist and composed some beautiful music for his instrument. His portrait can be seen on the Poland 1927 40g., on two stamps of the 1947 Polish Culture set and on two stamps of the Poland 1949 set to mark the Centenary of his death.

Franz (Peter) Schubert (1797-1828) spent his life in Vienna. He composed over 500 songs and many operas, masses, sonatas, overtures, cantatas and symphonies. Austria honoured Schubert on the 1922 Charity 10k. and the 1947 Famous Austrians 12g. Johann Strauss (1804-1849), native of Vienna and composer of many waltzes, appears on the Austria 1949 30g. issued on the Centenary of his death and on the 1922 Charity 50k. His son, Johann Strauss (1825-1899), composer of the Blue Danube Waltz, is portrayed on the Austria 1949 1s. issued on the 50th Anniversary of his death.

A Czech Composer

The Czech composer, Frederick Smetana (1824-1884), can be seen on the 1944 issue of Bohemia and Moravia commemorating the 60th Anniversary of his death, on the 1934 50h. of Czecho-Slovakia issued on the 50th Anniversary of his death and again on one of the two stamps issued by Czecho-Slovakia in 1949 to commemorate the 125th Anniversary of his birth. The Bohemian composer, Antonin Dvorák (1841-1904), is famous for his Slavonic dances. Czecho-Slovakia issued a special stamp in 1934 on the 30th Anniversary of his death, and in 1941 Bohemia and Moravia, under German rule, issued two portrait stamps on the Centenary of his birth.

Jean Julius Sibelius, Finnish composer of 'Finlandia', was honoured by Finland in 1945 on the 80th Anniversary of his birth with a special stamp bearing his portrait.

Several French composers have appeared on their country's stamps. Hector Berlioz (1803-1869), composer of many symphonies and the opera 'Beatrice and Benedict', is portrayed on the Unemployed Intellectuals Relief Fund 1936 40c. and 1938 55c. Claude-Achille Debussy (1862-1918), composer of lovely pianoforte music and of the opera, 'Pelleas and Melisande', is featured on the Unemployed Intellectuals Relief Fund 1939 70c. and 1940 80c. Charles François Gounod (1818-1893), famous for his masterpiece, 'Faust', his 'Romeo and Juliet', and 'Ave Maria', was commemorated by a special stamp issued in 1944. Jules Massenet (1842-1912), noted for his opera, 'Le Cid', was honoured in 1942 on the Centenary of his birth by a special 4f. stamp. Alexis Chabrier, composer of 'Espana' and 'Gwendoline', was featured on the 1942 Centenary of his birth by a special stamp in aid of the Musicians' Mutual Relief Fund. The composer of 'La Marseillaise', Rouget de Lisle, was honoured in 1936 on the Centenary of his death with two stamps.

Noted Russian

The Russian composer, Piotr Ilytch Tschaikovski, noted for his '1812 Overture' and 'Nutcracker Suite', was honoured by Russia in 1940 with a special issue on the Centenary of his birth. Two stamps bear a portrait and an excerpt from the score of 'Eugene Onegin', two the composer's house at Klin, and one a portrait and a passage from his Fourth Symphony. Russia also issued a set of four stamps in 1944 commemorating the Centenary of the birth of Nicholas Andreievich Rimsky-Korsakov (1844-1908).

Norway issued a set of four stamps in 1942 on the Centenary of the birth of Rikard Nordraak and a similar set in 1943 for Edward Grieg. In 1936 Brazil issued a set of four to commemorate the Centenary of the birth of Carlos Gomez. Two bear his portrait and two an excerpt from his composition, 'Il Guarany'.

The 1922 Austria Charity Fund for Needy Musicians set also depicts Franz Josef Haydn (1732-1809) on the 2½k., the tragic Hugo Wolf (1860-1903), who died of insanity, on the 100k., whilst the 25k. was allocated to the lesser known Bruckner. The master pianist, Franz Liszt (1811-1886), appears on the Hungary 1932 Famous Hungarians 20f. Another famous pianist, Ignace Jan Paderewski, first Premier of Poland in 1919, can be seen on the Poland 1919 15f. of the set issued to commemorate the First Session of Parliament in

(*Continued foot of page* 140)

An idea for ensuring a

DARK ROOM WATER SUPPLY

WHEN fitting up a dark room the amateur photographer very often finds the water supply to be the greatest problem. In order to carry out the various photographic operations in a really satisfactory manner it is necessary to have a supply of running water to hand. In many cases the lavatory can be turned into a really first rate dark room with very little trouble and the cistern used to supply the water.

Little Material Needed

Very little material is required and the job can be fitted up quite easily and quickly by the average handyman. The drawing clearly shows the general lay-out of the apparatus.

First place a small jar or even a tin into the free end of the cistern. The actual size will depend upon the lay-out of the cistern. It must not be in the way of the ball which operates the valve, nor obstruct the action of the main lever.

A jar 3ins. or 4ins. in height would be about the right size so that it reaches about half way up to the water level when the tank is filled.

The apparatus works on the principle of a syphon, and it is, therefore, necessary to have a small supply of water available to keep the syphon working when the cistern is emptied.

The pipe used to make the syphon can be quite small, as for most photographic work only a small supply of water is needed at any time. A piece of lead pipe or even rubber tube having an internal diameter of about ¼in. should be sufficient for general needs.

Bend the top of the pipe over to form a gentle curve and try to avoid sharp bends anywhere. The end should enter the jar and be fastened about ¼in. from the bottom. It is a good idea to cut off the end of the pipe at an angle of about 45 degrees instead of cutting it straight across. This prevents the water from ceasing to flow should the pipe drop down and touch the bottom of the jar for any reason.

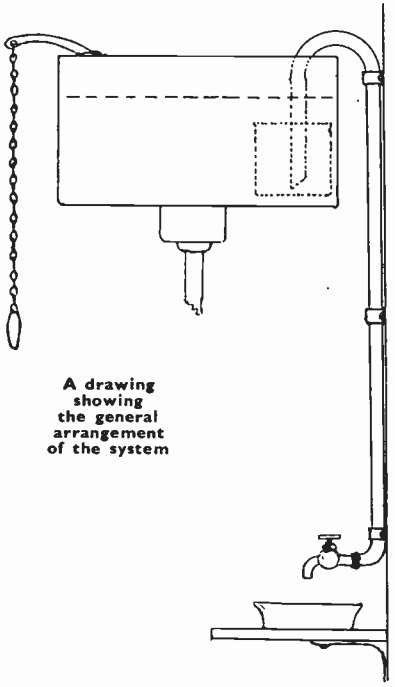
It is best to keep the pipe fairly short, although a length of several feet will not affect the flow to any great extent. Fix it to the wall with small metal clips and have the tap in a convenient position for working either over a shelf or so that a small table may be placed beneath it.

Small Tap

The tap can be quite small either the usual screw type or a small lever one such as is used on model engines. The only point to remember when fixing it is that it must be lower than the cistern—the greater the distance in height between the two points the greater will be the water pressure.

If a rubber pipe is used the tap can be dispensed with and the water supply cut off by means of a paper clip slipped over the pipe. This method does not allow the rate of flow to be nicely adjusted but it is useful if you want it fitted up in a hurry, or if a tap is too expensive.

To put the apparatus in operation it will be necessary to fill the pipe with water and this is best done by turning on the tap and sucking the air out. As soon as the water starts to flow the tap may be turned off and it will then continue to operate without any further attention.



A drawing showing the general arrangement of the system

Even when the cistern is emptied there will be sufficient water in the jar to keep the supply running while the tank refills. (155)

Composers on Stamps—(*Continued from page* 139)

Liberated Poland. The Roumania 1946 set issued on the 25th Anniversary of the Budapest Philharmonic Orchestra includes two stamps bearing portraits of the composer and conductor, G. Enescu. Spain honoured her Manuel de Falla on the 1947 25p. air, and Austria Karl Millocker in 1949 on the 50th Anniversary of his death. In 1948 Austria issued a stamp commemorating the 130th Anniversary of the Carol, 'Silent Night, Holy Night', depicting portraits of the composers, F. Gruber and J. Mohr. Germany on her Musicians' Anniversaries issue of 1935 has Heinrich Schutz on the 6pf., and Handel, who became a naturalised Briton and was buried in Westminster Abbey, on the 25pf.

A section of the U.S.A. 1940 Famous Americans set was devoted to composers. Stephen Collins Foster, composer of 'Jeannie with the light brown hair' and many other songs, appeared on the 1c. John Philip Sousa, famous for his military marches, was featured on the 2c., and Victor Herbert on the 3c. The 5c. showed Edward A. MacDowell and the 10c. Ethelbert Nevin.

Italy issued a set of six postage and five air stamps in 1935 on the Centenary of the death of Bellini, a portrait stamp in 1948 on the Centenary of the death of Gaetano Donizetti, and another portrait in 1949 to mark the Bicentenary of the birth of Domenico Cimarosa. The Centenary of the birth of Joseph Rheinberger was marked in 1939 by the issue of a portrait stamp by Liechenstein. Czecho-Slovakia issued two stamps in 1950 to commemorate the Centenary of the birth of Zdenek Fibich.

Apart from France with Rouget de Lisle, several countries have depicted the composers of their National Anthems. Brazil in 1945 celebrated the 150th Anniversary of the birth of Francisco Manuel da Silva with a stamp showing three bars of music and a portrait. Bolivia commemorated the Centenary of her National Anthem with an issue of six values in 1946. The design shows bars of music and portraits of Benedetto Vincenti and J. de Sandines. The 1947 Centenary of Chile's National Anthem was marked by the issue of a stamp bearing the portraits of Eusebio Lillo and Ramon Carnicer. Salvador issued a stamp in 1945 showing Genera, J. J. Canas, the author of the National Anthem, and Uruguay in 1942 commemorated the composer of her National Anthem, Francisco Acuna de Figueroa) U.S.A. honoured Francis Scott Key composer of the 'Star Spangled Banner', in 1948. (119

More experiments with acetic acid in HOME CHEMISTRY

ACETIC acid forms many salts with metals. Some of them find industrial use, and one of these is ferrous acetate, which is used in leather dyeing.

It is not made from pure acetic acid, but from the crude acetic acid obtained in the distillation of wood. The industrial name for this crude acid is 'pyroligneous acid'. When this is warmed and scrap iron dissolved in it, it forms a turbid liquid known as 'pyrolignite of iron'.

We can make this on the small scale by dissolving iron filings in acetic acid which has been diluted with three times its bulk of water. Warm the mixture and put it on the oven top for a day or two. Hydrogen will be given off slowly. When it has almost ceased, filter the liquid.

If you now make a strong decoction of logwood chips by boiling these with

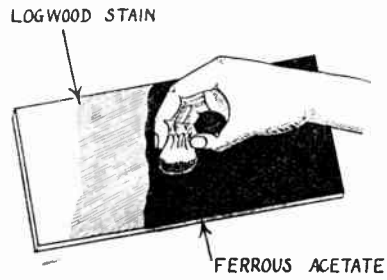


Fig. 1—Home leather drying

water you can perform a leather dyeing experiment. You can use a piece of new leather, or dye a pair of brown shoes black, if you first remove the polish from the latter by sponging them with a dry cleaning fluid.

Make a cotton dabber and swab the leather well with the decoction of logwood chips. Let it sink in and then swab over with the ferrous acetate solution. The leather immediately becomes black and after drying should be given a good rubbing with a cloth.

If the colour is not deep black, the logwood was not strong enough. You can deepen the colour by repeating the treatment.

Another acetate used in dyeing is aluminium acetate, and finds application as a mordant. Dyes which wash out of unmordanted cloth will 'stay put' when the cloth is mordanted before dyeing.

We can demonstrate this on a small scale. Add alum solution to lead acetate solution. Lead sulphate will be precipitated; filter this off and steep a piece of white cotton cloth in the filtrate until it is evenly wetted. Then wring it out well and put it in a fairly hot oven (about 100 degrees Centigrade, or 212 degrees Fahrenheit), until it is dry.

Decomposition

During the drying the aluminium acetate decomposes and forms a mordant of alumina on the cloth. When the cloth is dry drop it into boiling water for a few minutes to wet it thoroughly.

Then stir it round for a few minutes in a boiling decoction of logwood chips.

The cloth will become dark and, after washing it in hot water and drying, will be found to have been dyed light or dark purple, according to the strength of your logwood decoction.

Logwood decoction will not dye unmordanted cotton, and washes out when placed in water. Mordants were used in dyeing as far back as the time of the Ancient Egyptians.

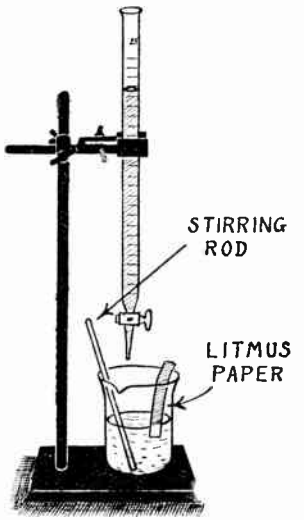


Fig. 2—A testing hint

With some metals acetic acid forms basic and superacid acetates in addition to the normal acetates. All the normal acetates are soluble in water, silver and mercurous acetates, however, being only slightly soluble.

An easily made normal acetate—and also a useful one to have in stock—is sodium acetate. To prepare it, add sodium carbonate (washing soda) solution, preferably from a burette or dropping funnel, to moderately dilute acetic acid (about one volume of acid to two volumes of water) until the acid is neutral to litmus paper.

A useful tip to avoid removing and testing odd drops with litmus paper is to moisten the paper and press on the inside wall of the beaker so that about ½in. of the paper dips into the acid (Fig. 2).

After neutralising, you will have a solution of sodium acetate. Now evaporate it to a syrupy consistency in an evaporating basin over wire gauze. As it is slightly deliquescent, crystallisation is difficult. Neither can it be evaporated to dryness over gauze, as it may char. These difficulties are easily sidestepped, however, by finishing the evaporation to dryness on a water bath. You will thus obtain the sodium acetate as a white powder. Bottle it while it is still warm to avoid it becoming damp from air moisture.

One of the superacid salts of acetic acid is ammonium diacetate. To prepare it, neutralise dilute acetic acid with ammonium hydroxide. This produces a solution of normal ammonium acetate.

If you now evaporate it to small bulk over wire gauze, it will give off half of its ammonia and be converted into ammonium diacetate. Finish the evaporation on the water bath until the liquid diminishes no more. You will thus obtain the ammonium diacetate as an oily colourless liquid.

Bottle it immediately, as it absorbs atmospheric moisture. It usually solidifies on long standing.

An everyday basic acetate is verdigris (copper 'rust'). It is actually a mixture of several basic copper acetates.

A very beautiful acetate is cobalt acetate and it is worth preparing a specimen for the sake of seeing its splendid red crystals.

First make some basic cobalt carbonate by precipitating cobalt chloride solution with sodium carbonate solution. Wash the precipitate with several changes of water in a big bottle until silver nitrate solution no longer gives a turbidity with the last wash water.

Filter off the precipitate, transfer it to a beaker, and dissolve it in just enough dilute acetic acid. Filter the resulting red solution if necessary and pour it on to a shallow saucer to evaporate slowly at room temperature. Gleaming flattened prisms will crystallise out. When all the solution has dried up remove the crystals and bottle them. (102)

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