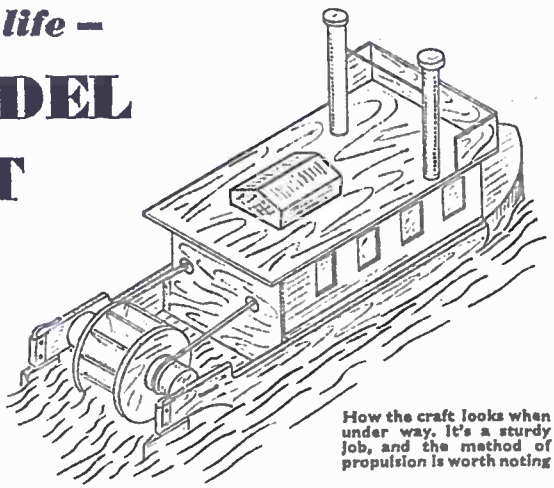
Hobbies WEEKLY

CONTENTS

February 13th, 1952 Price Fourpence Vol. 113 No. 2937

Rubber-powered and full of life —

A WORKING MODEL PADDLE BOAT



How the craft looks when under way. It's a sturdy job, and the method of propulsion is worth noting

THIS model is patterned on the 'stern-wheeler' river steamers popular in America, and is powered by rubber strip. As a rugged, working model it should delight any youngster. Construction has been kept as simple as possible and the 'working part' — the rubber motor, can be replaced in the event of it becoming broken.

Making the Hull

Start by making the hull. The bottom is cut from a panel of $\frac{1}{16}$in. ply with the front rounded off to a suitable bow shape. This shape should be quite blunt, in keeping with the appearance of full size vessels of this type. The remainder of the hull is then built up directly on top of this ply base — Fig. 1.

The bow blocks are cut from balsa wood, $1\frac{1}{4}$ins. thick. Any other light wood can be used, if preferred, but balsa combines the quality of being easy to work and glue, as well as being extremely light. Notch the bow blocks to take the two side strips, also of balsa, and fit the end bulkhead of ply. This bulkhead can be pinned and glued in place. All the balsa components are glued with balsa cement or strong waterproof glue. Use waterproof glue throughout in the construction of this model. A keel strip of $\frac{1}{4}$in.× $\frac{1}{4}$in. material is glued to the underside of the ply base, although this need not be added until a later stage.

The next stage consists of adding the front bulkhead of ply, decking in the bow with $\frac{1}{16}$in. ply and adding the cabin sides — Fig. 2. All relevant dimensions can be found on the drawings. The windows can be fretted out of the ply cabin sides or simply painted in place. The same applies to the windows and door in the front bulkhead. The rear bulkhead is drilled or cut out with two $\frac{3}{8}$in. diameter holes to clear the rubber motors and above these holes are located small hooks. The purpose of these will be discovered later.

Be Sure it is Waterproof

The hull at this stage should be waterproof, so make sure all the glue joints are good. The sides and bulkhead tops should be flush so that the deck or cabin roof and its fittings seat down squarely.

The cabin top is detailed in Fig. 3. The various fittings are simply glued in place. Although not shown on the drawing, it is an advantage to fit small blocks or strips of wood under the ply top so that this component is a push fit on the rest of the model. This allows the deck unit to be taken off to replace rubber motors, when required. Alternatively, the cabin top can be attached with four screws which are simply withdrawn whenever it is necessary to gain access to the interior. Normally there is very little risk of a rubber motor breakage and so this is not a major point.

Stern Wheel Carriers

The stern wheel carriers are fretted out from $\frac{1}{16}$in. ply, as detailed in Fig. 4. These glue directly to the sides of the finished hull, leaving $3\frac{1}{2}$in. projecting to the rear. A simple ply rudder is mounted under the end of each carrier. Pierce the rudder as shown and fit a brass or copper wire tiller. This then clamps in place to the end of the ply

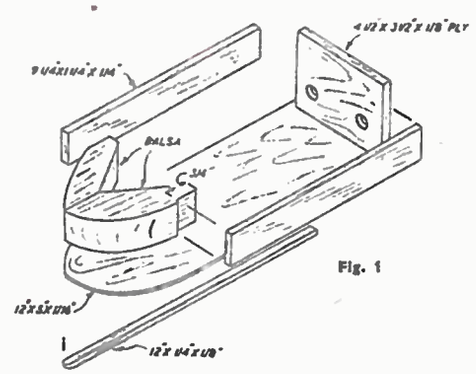


Fig. 1

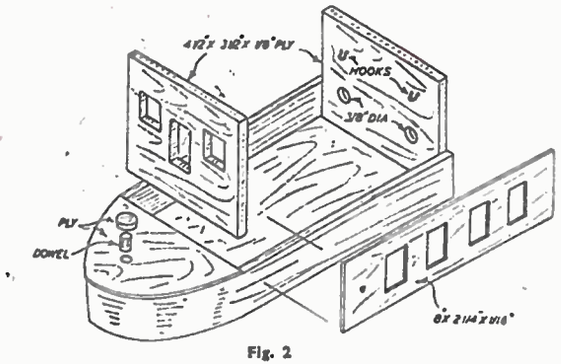


Fig. 2

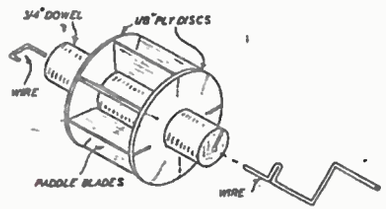


Fig. 5

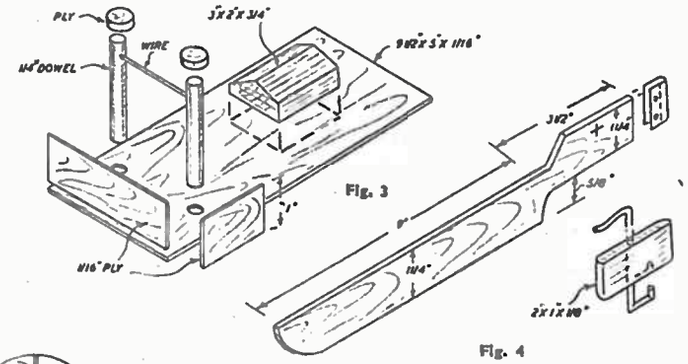


Fig. 3

Fig. 4

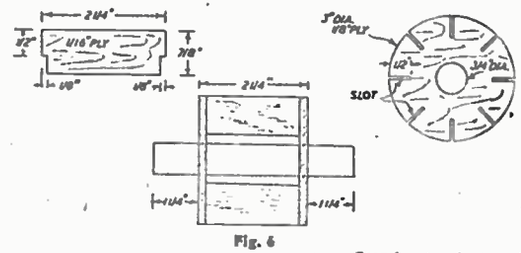


Fig. 6

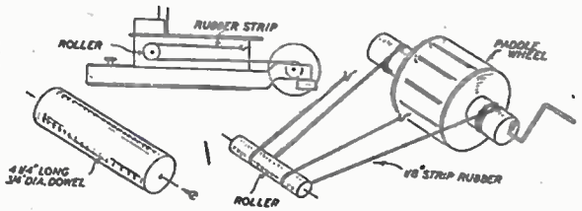


Fig. 7

Step-by-step instructions for making the model

members with a strap of metal, screwed in place. Each rudder, of course, can be adjusted independently.

The paddle wheel is detailed in Figs. 5 and 6. Fig. 5 shows the main assembly, the paddle wheel mounted on a length of ¼in. diameter dowel and mounted between the two ply carriers on the hull. The wire handle fitting at one side fits into a slot in the dowel end and should be retained by a small metal plate screwed across the end of the dowel.

Fig. 6 shows the component parts of the paddle wheel. Eight blades are cut from 1/16in. ply, to the dimensions shown. These glue into slots in the 3in. diameter wheels, cut from ⅛in. ply. The whole is mounted on the centre of a length of ¼in. diameter dowel, the actual width of the completed wheel being 2¼ins. and the overall width of the assembly 4¾ins.

The Power Unit

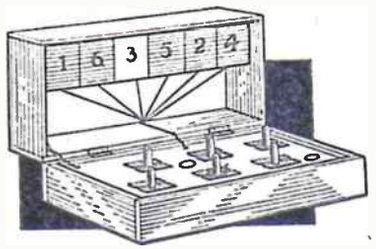
With the paddle wheel mounted between the ply side extensions of the hull, the power unit is arranged as in Fig. 7. A length of ⅛in. strip rubber is anchored to the ¼in. dowel each side of the paddle wheel and passes through the hole in the rear bulkhead, around a roller in the front of the cabin and back to the hook on the rear bulkhead. This rubber should be drawn taut. The motors are wound by turning the handle secured to the paddle spindle. This winds the rubber around the ¼in. dowel on either side of the wheel. When sufficient turns have been wound on, the wheel will spin freely under power. In water the paddle will turn slowly and realistically, generating enough thrust to propel the vessel.

The roller around which the rubber strip motors pass is also another length of ¼in. diameter dowel, pivoted between the ply cabin sides. Screws will form a suitable anchorage. Power may be adjusted by using larger or smaller rubber strip, as required. It will be found difficult to over-wind a motor of this type, but even if a motor does break it is quite a simple matter to replace it.

(248)

This model was devised by R. H. Warring, who designed the four flying model planes published in 'Hobbies' last summer. Full-size plans are still available for these aircraft and other model planes are due later this year.

AN ELECTRIC HOOP-LA GAME



THIS modern version of an old favourite will prove very popular during the darker evenings, and making it up provides an interesting combination of wood and electrical work. Each time a peg is ringed the appropriate score lights up automatically on the panel above, and the whole outfit packs away neatly when not in use. Small metal rings, such as can be obtained from any good ironmonger, are used, and the lighting is from a torch battery housed in the base of the model.

The dimensions given allow for wood of ¼in. thickness being used, but this can easily be varied as required. In addition to the wood shown in the Cutting List six flash-bulb holders and bulbs and a two-cell battery are needed, with a supply of thin but well covered bell wire; a strip of Perspex or similar transparent material for covering the score indicator; and the three or four brass rings, about 1½ins. in diameter (the heavier these are, the better, to make good contact on the plates)—also a piece of strip brass or tin from which can be cut the six pairs of contact plates 1½ins. square.

Cutting Out

Fig. 1 gives a general view of the case, which will be seen to consist of two identical shallow trays each measuring 12¾ins. by 8¼ins. external, and hinged together. The base, scoreboard and lid, which are all identical pieces 12¾ins. by 8ins., are cut to fit inside the sides and ends, and the ends fit inside the front and back edges. The two trays can be made up, but do not hinge them together yet, or screw on the front edge of the top half until the lamp compartments and holders have been added.

Rule up the peg board as shown at Fig. 2 and bore the six ¼in. holes for the pegs in the positions indicated. The pegs are six 2in. lengths of ¼in. dowelling, and are lifted out of the holes when the game is packed away. Glue a ¼in. square oddment of plywood at the back of the peg board, behind each hole, to act as a stop for the pegs. To support the peg board glue four strips of ¼in. by ¼in. round the inside edge of the base part, ¼in. from the top, as seen at Fig. 1. A simple holder for a standard two-cell battery can be cut from four pieces of wood as given in the Cutting List; but if any other type of battery is used this will, of course, need slight modification. Screw the pieces down to the bottom board, as shown.

The Lamp Compartments

Cut the lamp compartment strip

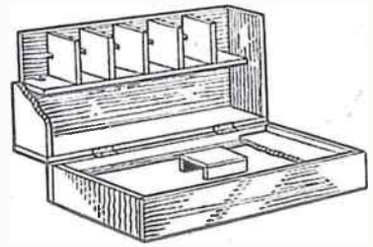


Fig. 1—The case

(12¾ins. by 2ins.) and the five partition pieces (2¼ins. by 2ins.) and cut a nick out of each partition piece for the flex to come through, as shown. Then screw the partitions on to the strip at equal distances apart—with wood of ¼in. thickness there will be 1⅝ins. clear between each partition. Make six small cuts in the strip, one in the centre of each compartment, for the flex to be taken through, as shown. Then lay the strip, with the partitions attached to it,

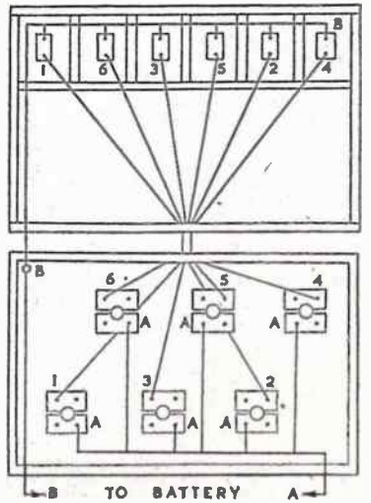


Fig. 3—The wiring

into its place inside the lid, and mark on the lid the position where the partitions will fall. With these marks as guides screw down the six lamp holders, one in the centre of each section, and finally screw down the strip and partitions. Leave the outside front edge of the lid until the wiring up has been done.

The Electrical Work

Cut six plates of sheet brass or tin 1½ins. square, and bore a ⅛in. hole in the centre of each piece. Then cut each plate into two lengthways, across the hole, and screw down each pair over the holes in the peg board. Leave a slight gap between the pieces of each pair, as shown in the sketch, and see that they lay neat and level on the board, so that when one of the metal rings comes down over the peg it makes electrical contact between the two halves of each plate.

Now we can get on with the wiring up, which will be seen in Fig. 3. Connect

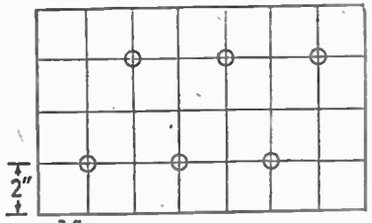


Fig. 2—Details of the peg board

one piece of wire to the top terminal of lamp-holder 4 (marked B), thread it through the holes in the lamp compartment sections, bring it down the side of the lid, through a hole in the corner of the peg board, and so to battery terminal (B). Then connect the other five lamp holders to this wire, as shown. Bring separate wires from the other terminal on each lamp holder down to the centre of the case, through a hole in the peg board, then connect one to the top half of each plate on the peg board, as shown in the sketch. The bottom half of each pair of plates is connected to a master wire (A) which runs along the edge of the board and so to the other battery terminal. For the sake of clearness the battery terminals are shown as being by the side of the peg board, but actually, of course, the battery is situated immediately underneath the board.

Put a bulb into each holder, then try

(Continued on page 308)

Easier to make than explain—that's

THE MAGIC PROPELLER

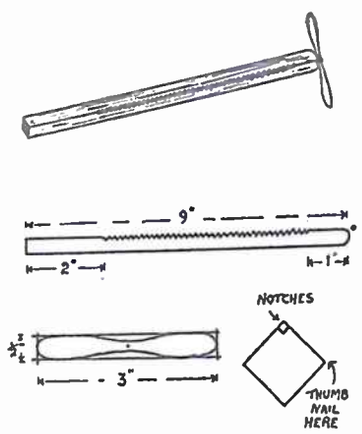
WE have described on this page a really remarkable little novelty with which to amuse your friends. There is, of course, a little trick in the way that it is worked, and unless they know how it is done, they will, indeed, be very mystified.

Even those who know how to make it work find it very uncanny why the propeller should revolve from no apparent reason. It is assumed to be due to static electricity, and as it possesses a certain amount of educational value it must be considered as more than just a toy.

The gadget consists of a square piece of stick having notches along one edge, and a small card shaped like a propeller. When the notches are rubbed, the propeller rotates in either direction according to how it is done.

Any kind of wood will do for the stick, although in order to make a really satisfactory job, one of the hardwoods such as oak is to be preferred. Cut a piece of straight grained wood 9ins. long and plane it down to ¼in. square. Glasspaper it smooth and round off one end so as to make a nice bearing for the propeller.

Mark off the notches on one of the edges, starting 2ins. from the square end, which is the handle to hold the gadget by. Divide the next 6ins. into thirty-six parts so that each notch will be ¼in.



Details of the toy

apart and leaving 1in. clear at the end.

Using either a sharp knife or a chisel, cut so as to form perfect right angled notches along the side.

The propeller is made of thin card—a piece of ivory visiting card is very suitable. A strip 3ins. long and ¼in. wide is shaped like a propeller and has a pin hole made exactly in the centre in order that it will balance correctly. If one side is too heavy, you have either made it too long or too wide, and it needs cutting a trifle.

It is not really necessary to make the card to the shape of a propeller at all, as it will work just as well if cut as a rectangle, but it looks so much better that way.

Fix the propeller on to the rounded end of the stick with a small pin, leaving it free to rotate easily.

To make the propeller rotate, hold the stick in the left hand in a horizontal position with the notches at the top. Rub the notches backwards and forwards with a pencil or similar piece of wood held in the right hand. At the same time the thumb nail of the right hand should make contact and slide along the smooth edge next to the notches as shown in the drawing.

After a few moments the propeller will start to rotate backwards. If, however, the nail of the first finger is placed on the smooth edge instead of the thumb nail the propeller will rotate in a forward direction.

Instead of using a pencil, the thumb nail may be tried alone. Place the top edge of the nail in the notches near the handle, and with the first finger exactly opposite underneath, rapidly move it along towards the propeller, which will start to slowly rotate. By changing over hands the propeller will rotate in the opposite direction. (271)

MAKING THE ELECTRIC HOOP-LA GAME

(Continued from page 307)

out the wiring system by laying a ring across each pair of contact plates in turn and checking that the bulbs light up. See that all joints are tight and well insulated, and the battery in position in its holder; then fix down the peg board with screws into the supporting strips on the insides of the case.

The Score Indicator

Cut the piece of Perspex to 12¼ins. by 2¾ins., divide it into six equal sections, and paint a different figure on to each, with enamel or indian ink. The figures given in the illustration are only one suggestion and can be varied according to fancy; but it will usually be found that the front three pegs get ringed more frequently than the back three—so good showmanship will see to it that the front ones give the lowest scores! When the numbers have been put on to the score panel, paint corresponding numbers against each peg, not on the metal plates (which may prevent electrical contact) but beside them on the wood. If each panel is tinted slightly with different coloured water paint, this adds considerably to the finished appearance, but the paint should not, of course, be dense enough to prevent the light from the bulbs showing up clearly. Fix the panel down over the lamp compartments with screws.

Finishing Off

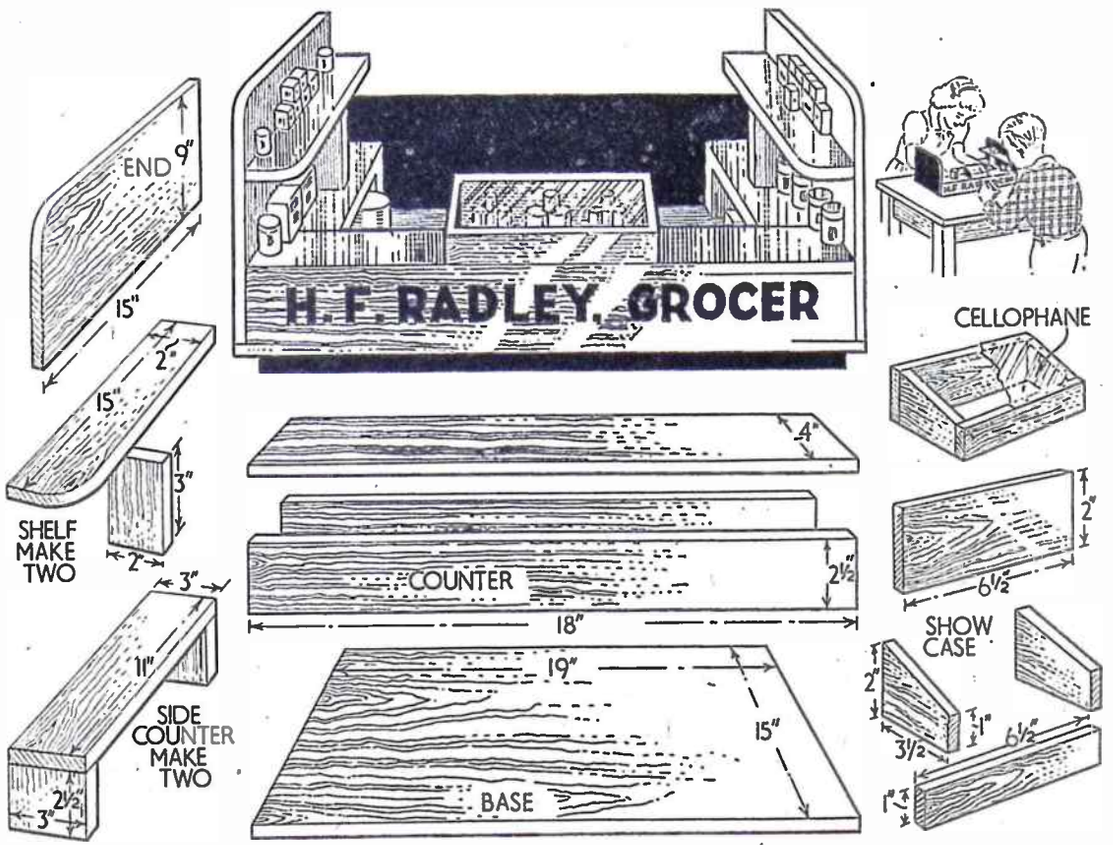
See that the six pegs fit firmly in their holes in the board. Hinge the two halves of the case together, and make two brackets of string as shown to prevent the lid portion from opening beyond the vertical position. The strings can be held on neat screws at each side. Finish off the woodwork with clear varnish or stain as preferred, and add a small fastener at the front of the case. (236)

CUTTING LIST
(for wood of ¼" thickness except where stated)

No. of pieces	Description	Size
3	Base, peg board and top	12½" × 8"
4	Front and back edges	12½" × 2½"
4	Ends	8" × 2½"
6	Pegs	2" × ¾" dowelling
6	Peg stops	¾" × ¾"
2	Peg board support strips	12½" × ¾"
2	Peg board support strips	8" × ¾"
1	Lamp compartment strip	12½" × 2"
5	Lamp compartment partitions	2½" × 2"
2	Battery holder, sides	3¾" × 1½"
1	Battery holder, end	2½" × 1½"
1	Battery holder, top	3½" × 3"
1	Score indicator panel	12½" × 2¾" (Perspex)

Detailed instructions for making

A TOY GROCER'S SHOP



OUR illustration this week shows a large toy shop measuring 19ins. wide and 15ins. deep. It is large enough for the young shopkeeper to stand behind the counter and serve out the groceries, and the small sketch in the right-hand top corner shows the completed toy in use. Note that the drawings are not to scale, but all necessary measurements are shown.

We suggest ¼in. wood for the main parts of the shop, and 1/16in. or ⅛in. for the show-case. If any other thickness of wood is used you must alter the measurements accordingly. It is possible to use thick cardboard in the place of wood, but in this case corner pieces must be glued in the angles for the sake of strength.

There are three counters, one long one at the front and two shorter ones at the sides. The main counter consists of three pieces as shown. The top is the same length as the sides and is fixed to them by means of glue and countersunk screws. Fix to the base and then proceed to build the smaller side counters. These consist of two end pieces and a top. This leaves an opening under the counter for storing some of the groceries. Fix in position behind the main counter as shown in the sketch at the top of the page.

The sides are next glued and screwed in place. Notice that the top front corner is rounded. The two shelves, which are also rounded at the front, are each supported by a piece 3ins. by 2ins. These pieces can be fixed about half-way along the shelf.

The construction is shown on the right of the page and the parts should be cut from ¼in. wood. Glue and screw these together, but do not fix to the counter. It may be removed so that a display can be arranged underneath. Pin a piece of transparent celluloid across the top.

To finish the shop we suggest high gloss enamel. The counters and floor can be light brown, and the sides and front of the counter cream. The inside of the showcase can be cream, but the outside could be light green or blue. The name across the front can be cut from an advertisement in a paper or magazine or can be painted in by hand.

All that remains now is to make the jars, bottles and boxes that go to make the stock in trade of the shop. The jars can be made from odd pieces of round rod. Cut them up into short lengths, paint them in bright colours and then stick little labels in place on the sides. Print the labels in indian ink. Boxes and tins are made from odd pieces of square stripwood in a similar manner. (283)

Beginners at photography should learn

HOW WE GET ENLARGEMENTS

AN enlargement is a big print taken from a little negative and it is made by putting the film into an apparatus which works exactly like a magic lantern.

The negative goes in the place of a slide, and as in the lantern, there is a lens in front and a light behind, and, just as the lantern throws a large picture of the slide on to a screen, so an enlarger sends forward a large rendering of the negative.

With the magic lantern (or cinema) however, the views are 'projected' onto a white screen of considerable size, where they are looked at by the audience. In the enlarger the 'picture of the negative', as we might call it, is sent forward only a short distance to a printing frame or easel where there is a sheet of sensitive paper.

As will be generally known, ordinary prints are made by bringing sensitive paper into contact with negatives and giving brief exposures to light. Well, in the enlarging arrangement, the enlarged image of the negative as it lies on the sensitive sheet acts precisely as would a negative of that size, and so a print *of that size* can be made.

This picture shows how enlargements make it possible to look right into your photographs. No would-be photographer should be without some means of enlarging his work.

The actual procedure is that the negative is inserted in the enlarger and the light switched on. An image of the negative immediately appears on frame or easel — which for the moment only contains a piece of white paper. By moving the easel nearer to, or further from the enlarger and refocusing the lens, a sharp image of almost any desired magnitude can be obtained. The enlarged image need not be the whole of the negative, as it may be desired to 'take up' only a part, as when a single face is to be taken from a group.

When all is ready a cap of yellow glass is placed over the lens which, while it still lets the image on the paper be seen, permits only rays of light to pass which will not affect photographic paper. All other lights in the room are out and, the enlarger being light-tight, the only illumination now is the yellow beam coming through the cap.

The back of the easel is next opened and a sheet of sensitised paper inserted. This is of a class known as 'Bromide' which is much more responsive to white light than either 'Gaslight' or 'Printing out Paper' (*i.e.* paper for printing in daylight).

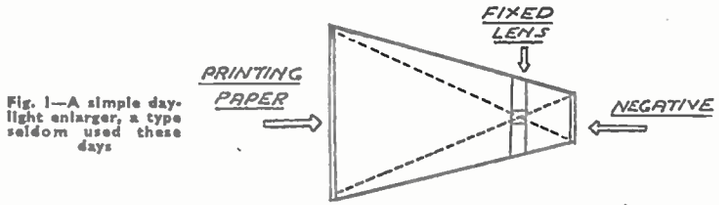


Fig. 1—A simple daylight enlarger, a type seldom used these days

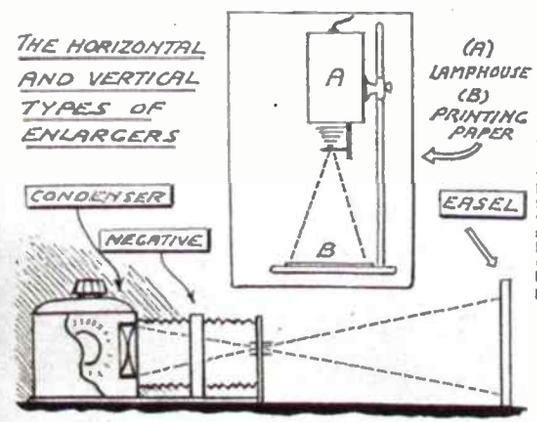


Fig. 2—Illustrating the horizontal and vertical types of enlarger. Most professionals prefer the vertical, though some still champion the horizontal. Each has certain advantages, but the vertical is probably the most convenient

Exposing

All is now in order for the 'exposure'. It is made by removing the cap for a brief period of time, thus allowing the projected image to appear in *white* light on the sensitive surface.

The exposure may be anything up to several seconds and the cap is then replaced, the paper being removed and developed at a bench some little distance away, in a suitable solution and under a bright yellow light which permits the operator to see how the image is coming up, but which, as with the cap, does not affect the paper.

Like Gaslight paper, the surface immediately after the exposure looks no different (with daylight paper the image appears at once). The picture, however, makes its appearance in the developing solution, faintly at first but quickly becoming stronger and stronger. When it is 'developed' enough, the print is placed in hypo. for a time, then well washed and dried, and the enlargement is made.

Enlargers are broadly divided into two classes, 'horizontal' and 'vertical'. There is a third class, the 'daylight', but this kind is not used very much. The horizontal enlarger is just like a miniature magic lantern and projects the negative on to a sheet of paper held in an easel (see lower sketch Fig. 2). The vertical enlarger, however, works by sliding up and down a strong upright and projects its picture *down* on to the printing paper which lies on the base as does a sheet of paper on a table — see also Fig. 2. This type is becoming more and more popular, as the operator can far more easily arrange a picture by looking down on to it.

The daylight enlarger (Fig. 1), is a box which is loaded in the dark room with the negative at one end and sensitive paper the other. It is then taken into the open and pointed to the sky for a few seconds to make the exposure. This kind of enlarger is not much in favour, however, as daylight is always varying in quality, and what is a correct exposure one moment may be quite wrong the next. Also, only one size of enlargement can be made, whereas with the other two types, pictures of practically any size can be secured.

The main consideration with artificially lighted enlargers is to get an even flood of light over the negative, and to this end a lens is placed between the lamp and the film, spoken of as a 'condenser'.

Reflected Light

But it is possible to get the even 'flood' by using *reflected* light. As this method dispenses with the condenser (which is an expensive and awkward item to fit) it is quite feasible for the amateur to make his own reflecting enlarger. He can, moreover, use his camera as lens, and we will complete this article by telling you just how it can all be done. The reflecting enlarger, incidentally, is not much heard of because it is slower than the condenser type but it nevertheless gives very excellent pictures and is just the thing for beginners. Take a good look at Fig. 3 for this gives the general idea.

(A) is a strong box of wood or card which has two electric lights suspended from the top — one on either side. These are wired in parallel to one plug and hang by their own flex. Behind the lights a sheet of white card goes right round the back of the box to two stiff wings of card which protrude from the front on either side of a rectangular opening (B). The wings are to prevent any direct light getting to the opening for all illumination must be reflected from the card at the back.

Camera in Front

In front of the opening, as shown, goes your camera with its back off or swung to one side, and the shutter at 'time' and open. Between the box and the camera an arrangement is made to hold the negative. This is but two lips of wood fastened either side of the opening (to the box) into which will slip a card sandwich that in its turn holds the film. The sandwich is merely two rectangles of card hinged by tape at one side and with a rectangular aperture in each. Fig. 4 shows these details.

The easel can be a small picture frame, held in the perpendicular to a base by an angle-iron. Build for this frame a simple back which by hinging at the bottom can be dropped or pressed up against the glass.

To work the enlarger some sensitive paper will be needed, a darkroom lamp and developing and fixing solutions as for films. Insert a thin negative in the 'carrier' first to get some idea of how the focusing works out and then put in the negative from which you want to work. Switch off the light in the enlarger and put a small strip (a trial strip) of the sensitive paper in the frame, and switch on again for a few seconds. Again put the light out and removing the strip develop in the solution you have ready under the safe light of the darkroom lamp.

Few Attempts Necessary

At first you will be hopelessly out, but with a few tries you will get the idea of what exposures to give and soon will be able to produce quite good enlargements. (267)

And here's an Enlarger YOU can make

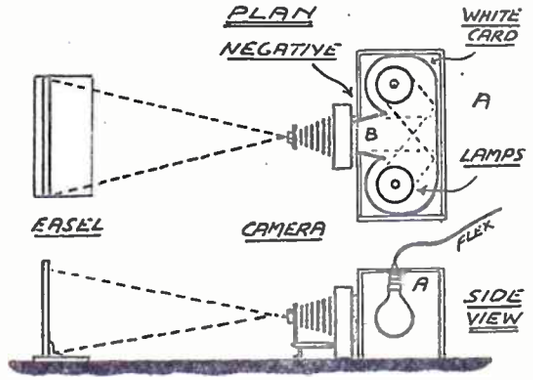


Fig. 3—How a 'reflected light' enlarger works

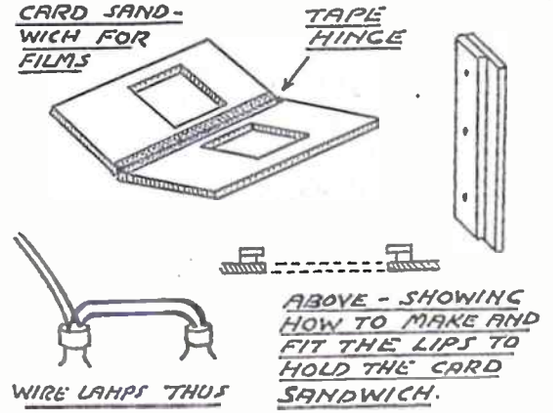


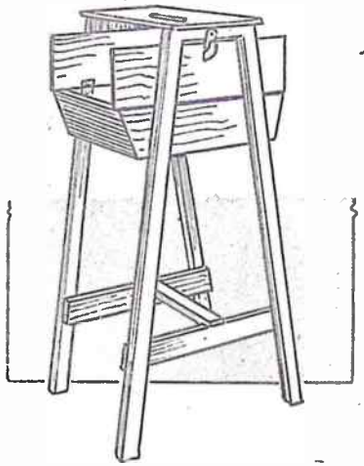
Fig. 4—Fittings for the reflecting enlarger

KEEPING 'GEM' BEARINGS CLEAN

When one is doing a lot of fretwork (writes a reader) a lot of dust collects all round the bearings of the axle beneath the cutting table. A certain amount of this must go down the oil holes, and so gradually makes the running harsh. All I have done is to cut off the heads of two nails, leaving a stump of nail to them, and inserted them in the holes. They make fine caps, and are easily removed to oil the machine.

An easy-to-make acceptable gift is

A LIGHT WORKBOX



THIS design of workbox is of specially light construction, and so can easily be carried from room to room by a lady. It is provided with a tray, commodious enough to hold the usual appurtenances for needlework and knitting, and has a small top, just large enough to accommodate cotton and scissors, ready to use. For construction, a good quality hardwood would be best, but if nothing better is available, quite a satisfactory article would result from plain deal, which could be nicely enamelled afterwards.

How to Start

A side and end elevation are given in Fig. 1, with suitable dimensions. Make a start with the side frames, which also include the legs. It will be seen these are splayed outwards to help make a stable fixture. As all sizes of timbers to be used are given in the cutting list, it is not necessary here to refer to them. Cut the legs of the side frames, and short and long rails to length first. Join each pair of legs together at the bottom with the long rails, using a single nail to each first, partly driven in. Place the short rails across at the top, and press the legs inwards to join them. Mark the slope of the legs on the rails, by pencil lines, then take apart and halve both tops of legs and ends of rails to make the simple corner joint, shown in detail (B) in Fig. 2.

Nail and glue the rails permanently to the legs, and when the glue is set hard, trim off all projecting pieces, and cut the bottoms of the legs to bed flat to the floor. See that both frames are alike, and at the distance down, shown in Fig. 1, square lines across where the workbox will come later on. Now cut the bottom cross rail, reduce the ends of this to half thickness, where it comes over the side rails, and there nail and glue it in position. It adds to the neat effect generally, to slightly bevel off the square ends of the rails or round them a little. In all cases, where nails are employed, use the oval kind, and punch them down slightly below the surface.

CUTTING LIST

Legs (4)—2ft. 4½ins. by 1½in. by ½in.
Top rails (2)—5½ins. by 1½in. by ½ in.
Bottom rails (2)—1ft. 1½ins. by 1½ins. by ½in.
Centre rail—11½ins. by 1½ins. by 1½in.
Tray sides (2)—1ft. 2ins. by 3ins. by ¼in.
Tray ends (2)—10½ins. by 3½ins. by ¼in.
Tray bottom—1ft. by 11ins. by ¼in. (plywood).
Divisions (2)—1ft. 1½ins. by 2½ins. by ¼in.
Lids (2)—1ft. 2ins. by 5½ins. by ¼in.
Top piece—1ft. 1½in. by 5½ins. by ¼in.

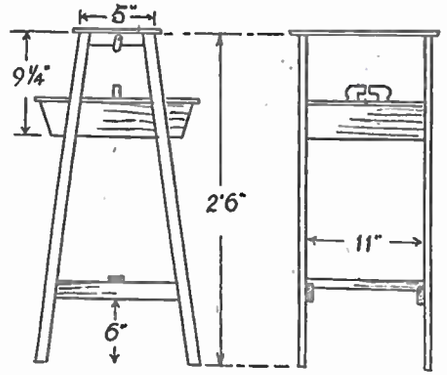


Fig. 1

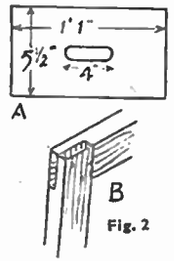


Fig. 2

The workbox is shown separately in Fig. 3. Cut the parts to dimensions given, note the ends of sides are sloped a little, then glue and nail together. Afterwards plane the top and bottom edges of the ends level with the rest, and nail or screw a bottom on. Interior divisions can be put in to suit the reader's own ideas, just as a suggestion, we recommend two longitudinal divisions, to divide the box into three equal parts.

The lid is formed of two pieces, hinged at the sides to meet together at the centre. It is important here to hinge the lids as in detail (C), so that when opened they line up level with the sides. Brass hinges, 1in. long, will serve here, and it will be easier to fix them before the divisions are nailed across. A pair of handles, cut from any scrap wood available, are made to the pattern shown at (D), and fixed to the lids from below with glue and a single screw to each. See that the handles are in line, and nearly, but not quite, touch each other.

Now fix the workbox to the side frames, at the distance from the top given in Fig. 1, using a single screw to each leg, and, preferably, driven in from inside the box. Open up the lids, and fix to the outsides of the top rails a wood or metal button, which can engage with the handles, and keep the lids open when the workbox is in use. Now cut the top, the size of which is given at (A) in Fig. 2. In the centre saw out the slot shown, 1in. wide, and glasspaper the edges of it, as it serves as a finger grip for carrying the workbox about. Just slightly round off the sharp corners of the top, and screw it to the top of the frames. Round-headed brass screws would look better than the flat ones here, and the slight projections not be in the way.

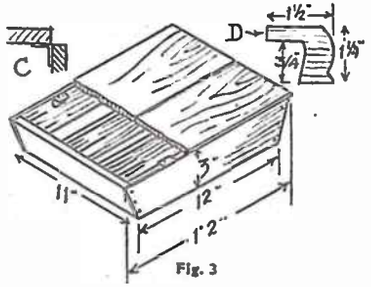


Fig. 3

Stop all nail holes level, and if made of hardwood, stain and polish, or treat as the wood may suggest. If of deal, an undercoat would be better, finishing off with a coat of enamel. Such refinements as lining the box can be added as desired, of course. (253)

DESIGNING AND BUILDING MODEL RAILWAYS

By E. F. Carter

LET us first take some possible 'O' gauge layout plans for the 10ft. by 10ft. box-room mentioned last week.

It must be remembered that as it is impossible to run the track hard up against the wall, or right into the corners of the room, our main-line will, obviously, not be 40ft. long, but about 8ft. less.

In Fig. 1 is shown diagrammatically just where the loss occurs. Curves of 3ft. radius are used which account for about 20ft. of track, with four 3ft. lengths of straight interposed; the track being situated 6ins. from the walls.

In the case of a double track—which is not to be advised in so small a layout—the radius of the inner track must be made proportionately smaller, so that it gives the correct 'sixfoot' way between the tracks (Fig. 2).

Now, assuming our trains run at a scale 30 miles per hour (which is represented by a speed of 1ft. per second), it should take our train a fraction over half a minute to traverse a complete circuit of track, which is about a scale ¼ mile long—not very long as real railways go.

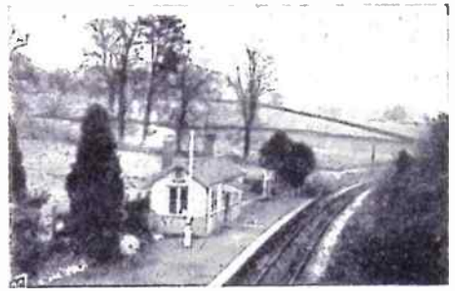
Low Speeds More Realistic

It will now be understood why small engines and short trains were suggested for such a line. Maximum speeds must, inevitably, be low, and trains short unless many unrealistic absurdities are to be tolerated when operating the line.

A six or seven wagon goods train, with a small tank engine will look intriguingly satisfying when chugging round at about 15 miles per hour, and thereby taking a full minute to return to its starting-point on the circuit. On the other hand a Stanier 'Pacific' with even only a three-coach train doing a scale 60 m.p.h. would look intolerably absurd when racing round the room in a mere 15 seconds, to say nothing of the ever-present risk of derailment at speed on sharp curves with attendant damage to the rolling-stock.

Now short trains, tank engines, and small country stations, do not necessitate very complicated track layouts, but rather those of very simple prototype design, which will not be expensive to build, but which will yet be capable of providing for an interesting sequence of running operations. Here again, designing with a plan in ultimate view is absolutely essential, for we have not much space to play with, and we want to make the best use of it.

If we restrict our rolling-stock to that having but a short fixed wheelbase, we can permit the use of sharper radius points in our layout without the fear of constant derailments during shunting operations. So our planning must also be made to include our choice of rolling-stock if the line as a whole is to be a success.



This might well be a model halt-type station

A typical single-line terminal station

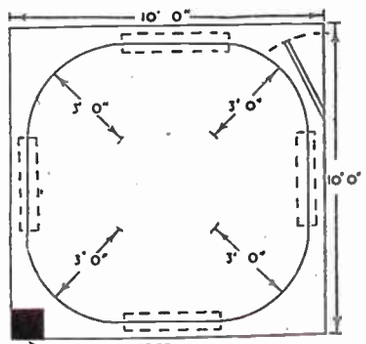


Fig. 1

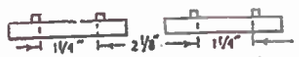


Fig. 2

At this stage it is absolutely essential that a firm decision is made to make a good convincing model of a small section of a country line, rather than to attempt to build what would, inevitably, be a bad model of a section of prototype trunk main-line. Remember the old tag: 'You can't get a quart into a pint pot'!

(*Continued foot of page 314*)

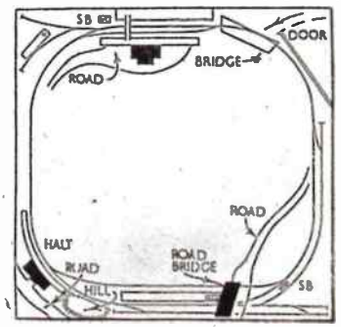


Fig. 3

Removing Tea Stains

COULD you tell me a way to remove tea stains from the inside of an aluminium tea-pot? (J.T.—Wimbledon).

THE interior of aluminium tea pots and the like, can readily be cleansed by first rinsing out with hot water, and then nearly filling with hot water, adding a fair-sized piece of rhubarb, or a couple of plums or other acid-containing fruit, and boiling for a few minutes until the tea stains are gone. Failing fruit, use the well-known detergent sold as 'Tide' or use 'Persil', but with these it may be necessary to use several separate boilings if the stains are very deep or old. In each case, wash out thoroughly with clean hot water.

• • •

Casting a Handbell

COULD you give me details how to make a mould for a hand bell, also what metals to use in casting the bell and what material for the mould? (G.B.—Biggleswade).

HAND bells are preferably made of bell metal, bronze, silver, or any resonant metal. The moulds can be made of various materials, but good fine-grained wood such as yellow pine or obeche are preferable. One member must be turned to the exact size and shape of the desired bell plus a small extra amount to compensate for shrinkage or machining. A 'print' must be turned on the lower part of the first mould to enable the internal member or core to register. The core is a turned member corresponding in shape to the desired internal shape of the bell. These 'patterns' as they are called, are used to form the desired shapes in the sand boxes into which the molten metal is poured.

• • •

Revolving Mirror Ball

I WOULD very much like to make a revolving electric mirrored ball, such as are used at dances. They are mostly diamond shape and arranged in such a way that when a spotlight is played on it, it throws off small star-shaped shadows. Can you give me any information on the subject? (F.M.—Marlow).

TO make a revolving mirror ball will depend largely on what is available. For example, an old-fashioned 'bottle jack' could provide the motor power, or if a small electric motor with a reduction gear to ensure a slow rate o revolution, or a gramophone motor could be used, upside down, with the ball attached to the centre spindle by means of a wire or chain. The ball could be made from a football bladder inflated, with pieces of mirror solutioned to it and secured by crossbandings of adhesive tape. If star-shaped 'spots' of light are wanted, a black paper mask with a star cut out of it should be pasted over the mirror. Transparent colours can be obtained usually from a photographic dealers or an artists' supply shop. These are made for colouring the old-fashioned lantern slides and for 'transparencies'. Failing this, you might get the desired effect by using thin coloured glass often to be had from a builders' merchant, or by using thin coloured plastic sheets.

• • •

Finishing Hardboard

I HAVE made a combined bureou-book-case, the carcase of which I have clad with ¼in. hardboard. Shall I polish or stain and varnish? Also, can you tell me please the correct treatment for the hardboard before I start operations? (J.W.—Goole).

THE texture of the hardboards varies a lot, but mostly are very absorbent. As you intend to stain yours, try out the stain first on a spare piece of the board, and dilute the stain as two or more applications may be necessary, especially if other show parts of the work to be stained as well are of solid wood. This is very necessary as the stain may show up quite a different tone on the hardboard from elsewhere. Use concentrated size, and mix a little stronger than the directions on the packet. It may be necessary to give two coats of the size. Then finish with a first coat of clear copal varnish, allow this to harden then rub lightly over with worn glasspaper and apply a second and final coat.

• • •

Stained Piano Keys

COULD you inform me what to do for brown stains on the keyboard of a secondhand piano? (J.W.B.—Birmingham).

TREATMENT of the keys of an old piano depends on the material of which the keys are made. For example, if the keys are of ivory, they can be cleaned by washing them with a dilute solution of oxalic acid, and following by washing with warm water. If, however, the keys are made of celluloid or some form of plastic, the stains can be removed by washing with a dilute solution of acetone. Another plan is to use an abrasive such as finely powdered pumice powder applied on a damp rag, rubbing lightly until the stains are removed. Then re-polish with any good wax polish.

Designing and Building Model Railways

(Continued from page 313)

There are many hundreds of suitable prototype single-line country stations all over the country, of which some track plans will be given later in this series of articles, so the main problem rests not with station layouts, but the fitting of them into the short main-line and into the available space area at our disposal.

Shown dotted on Fig. 1 are some of the best positions for stations, placed on the assumption that a single line with trains running in both directions, is being used. In all these cases it is understood that the stations will be placed at passing loops, and would thus have 'up' and 'down' platform faces; the stations being either of the 'island' (central platform) type, or of the two-platform variety. Both types are equally common, and could be incorporated into the railway.

For reasons of platform edge clearances on curves, it is not a good plan to place stations on that part of the layout, though one might be so placed by way of variety without the incorporation of the station passing loop; thereby producing a station of the single-platform 'halt' type; which are quite common on some small branch lines.

If the stations are situated on the straight 3ft. sections, it will be an easy matter to utilise the awkward corners of the layout for siding accommodation, engine sheds, or short 'works' sidings of the 'lime works' type; all of which give opportunities for individualism in modelling, to say nothing of their providing a reason for goods traffic.

One or two such layouts are shown in Fig. 3, which is capable of great modification by the reader, but particular attention should be given to the way in which the points and crossover roads have been diagrammed, as there are right and wrong ways of laying point-work; and nothing is easier than to design an entirely unrailwaylike and indeed, unworkable station layout. But more of this in the next article. (262)

It isn't hard to make

A PIPE FOR THE SMOKER

WHEN thinking of a present for our men folk, a pipe to smoke ranks high in the list of possibles. A pipe really makes an ideal gift, more especially if it is a well finished article that you have made yourself.

The invention of the smoking pipe is accredited to the Indians many centuries ago, and since that time a vast variety of materials have been used in its manufacture.

From the primitive corn cob to the highly finished article of today, the most popular material has, undoubtedly, been wood in some form or other.

It is not a difficult job to turn out a really satisfactory pipe in wood and one you could be proud to present as a gift.

Points to Remember

There are one or two important points to remember when choosing the wood—it is first very necessary to use only that which is thoroughly seasoned. If you are collecting the wood yourself from the countryside, it is a good idea to allow it to season for a whole year if possible before using. While you are getting in a stock, there is much well seasoned wood about to experiment with.

Unseasoned green wood is very 'woolly' to work and is liable to crack after it is made up, especially when the pipe becomes hot. The harder the wood is the better, and it should also be straight grained and perfectly free from flaws of any kind.

There are many different kinds of wood suitable for pipe making and it is interesting to experiment with different varieties. Briar is a great favourite and it is the hard root stock that is generally used.

Large quantities of this wood are imported each year from the south of France for making pipe bowls, but the English countryside is quite capable of producing some equally good. The root is particularly incombustible and is very enduring and is, therefore, very suitable for the job.

Another very popular wood is cherry which is capable of producing a highly finished article.

Very few tools are needed and the few simple processes can be easily carried out by the average handyman. The sizes to make the pipes may vary somewhat but the following measurements may be taken as a fair average. A good size for the bowl is between 1¼ins. and 1¾ins. diameter, which allows the centre hole to be from ¼in. to ⅜in.

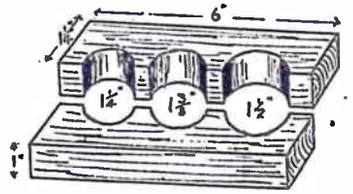


Fig. 1

Fig. 2

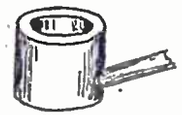


Fig. 3

Fig. 4

Fig. 5

For a shallow bowl the depth may be about ⅞in., increasing to, say, 1¼ins. for the larger sizes. The stem is usually between 3ins. and 5ins., with an external diameter of from ¼in. to ⅜in.

We will assume that you have a stock of well seasoned wood and are ready to start work.

Clamp Needed

In order to hold the bowl firm while you drill out the centre hole, you will need a clamp of some sort. A very suitable tool for the job is illustrated in Fig. 1 and consists of two blocks of wood which can be fixed in the vice, and will hold any size bowl secure while the work proceeds.

The best way to make this is to get a block of wood 6ins. long, 2½ins. wide and 1in. thick. Drill the necessary holes 1¼ins., 1⅝ins. and 1½ins. down the centre and then cut it in two. A softish wood is probably best, as it will grip the bowl better.

This method will hold most types of bowl, including those odd shaped ones, especially when it is necessary to work on a bowl without disturbing the bark in any way. Many people like a pipe with the bark left on, and will be eager to possess one.

A screw-head centre bit is probably the best type to use to drill out the hole in the bowl, as it makes a cleaner cut when doing this type of end grain drilling. Be careful to get the hole central—a bowl that is out of centre is more liable to crack than a correctly drilled one.

A good way to finish off the hole is to wrap a piece of glasspaper round a dowel rod, place it in the drill stock and polish quite smooth.

There are many shapes in which the bowl may be made and a few examples are shown in Figs. 2, 3 and 4. A file will be the most useful tool for getting these to the correct shape, and for smoothing off you may use a finer grade.

Next drill out the hole for the stem and be sure that it enters the bowl right at the bottom of the centre hole. The stem hole can be made at right angles to the centre hole or it can slope upwards a little as shown in Figs. 3 and 4.

The Stem

The stem is made of a straight piece of wood, the same kind as the bowl but of smaller section. Slightly taper off the end to fit into the bowl tightly and then bore the hole through it. This will, no doubt, require a little practise in order to make a satisfactory job, especially with the longer stems.

A red hot wire such as a steel knitting needle is the best and easiest way of doing this job. Make a small clamp to hold the stem similar to the bowl clamp. It may be necessary to reheat the wire several times and you will find that only the end needs to be kept hot, otherwise you are liable to burn the beginning of the hole and make it too big.

This is a job that must not be hurried, as it is essential to keep the wire perfectly upright in order to make a nice central hole.

There are many ways in which the mouth piece of the stem may be shaped and Fig. 5 shows several of these.

There is one special point of interest when making cherry wood pipes and that is the well known cherry wood perfume. This is easily acquired by placing the finished pipes in a box containing the dried leaves of the cherry tree. Leave them in this for about ten days, when they will have absorbed the perfume.

When cleaning out a pipe it should not be tapped on something hard, as this is liable to crack it. Use a knife instead and carefully scrape round the bowl. (271)

Calcium Chloride in

HOME CHEMISTRY

A MUCH used calcium compound in chemistry is calcium chloride, on account of its great attraction for water.

This property makes it invaluable for drying most gases and liquids, for it removes moisture from them without acting chemically upon them. There are, however, a few exceptions. Neither ammonia gas, methyl alcohol, nor ethyl alcohol can be dried by calcium chloride, for it forms compounds with them.

We can prove the unsuitability of calcium chloride for drying in such cases by preparing specimens of these compounds. First the ammonia compound.

The principle of the experiment is to pass ammonia gas over calcium chloride,

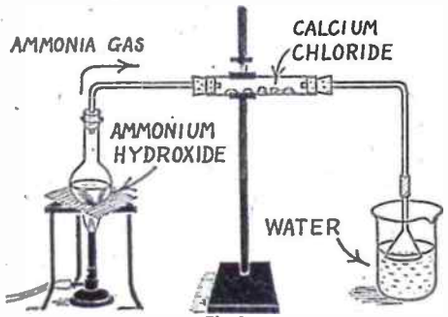


Fig. 1

as the apparatus shown in Fig. 1 indicates. The inverted funnel just dipping into water serves to safely absorb any surplus ammonia and so keeps your laboratory atmosphere bearable! By using a funnel instead of a tube the water cannot rush back into the apparatus, since it falls out after rising a short way.

Ammonia Gas

Warm the ammonium hydroxide in the flask. Bubbles of ammonia gas soon begin to appear. Now watch the calcium chloride. It will begin to swell and eventually is converted into a bulky white powder. When no further swelling takes place, stop heating the flask.

Disconnect the reaction tube and shake out the white powder. This is calcium octammine chloride. To prove it contains ammonia, heat a little of it in a dry test tube, when you will notice a strong smell of ammonia.

A spectacular conjuring trick can be done with this substance, in which you convert 'water' into red 'wine' and produce a fountain as well.

Heat some calcium octammine chloride in a test tube fitted with a cork and delivery tube and fill a flask with the evolved ammonia by upward displacement (Fig. 2). A piece of wet red litmus paper held 1in. below the flask mouth will turn blue when the flask is full.

Fit the flask with a cork and tube drawn out to a fine jet as shown sectionally in Fig. 3. On the bottom of the tube put a short length of rubber tubing and fit it with a burette clip. Add some phenolphthalein to the water in the beaker; this will remain colourless.

On opening the burette clip the water will rush up the tube into the flask,

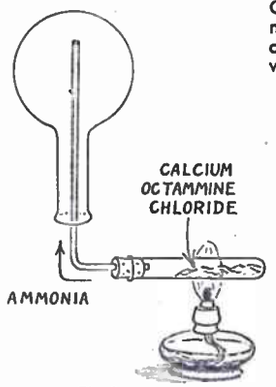


Fig. 2

dissolve the ammonia gas and so produce a red fountain as it emerges from the jet.

With ethyl alcohol, calcium chloride forms an alcoholate, just as with water it forms a hydrate.

Put half a test tube full of powdered calcium chloride and a test tube full of methylated spirit into a flask. Fit an upright condenser to the flask, as for boiling under reflux, and set the flask on a boiling water bath.

Let the meths. boil for a few minutes, then disconnect the flask and decant the meths. off any undissolved chloride into a large test tube. Cork the tube and let it stand a few hours, when white calcium chloride ethyl alcoholate will have crystallised out.

Remove this and dry it quickly by pressing between filter paper and keep it in a well corked bottle, for it is deliquescent. The product will also contain a small proportion of calcium chloride methyl alcoholate, owing to the meths. containing methyl alcohol.

Now heat a little of the substance in a small dry test tube and the alcohols will be regenerated. If you hold the tube mouth to the flame the vapours will burn with a blue flame.

Artificial gypsum, from which Plaster of Paris is made, is easy to prepare from calcium chloride. Dissolve half a test tube full of calcium chloride in about 50 ccs of water and add sodium sulphate (Glauber's salt) solution until no further white precipitate is formed. This is dihydrated calcium sulphate and has the same composition as gypsum.

Filter it off, wash it on the filter and dry it in a cool oven. If you now heat some of this gently in a dry test tube water will be driven off and Plaster of Paris formed. When no more water condenses on the test tube wall, absorb the water with strips of filter paper and shake out the plaster. If you now mix it with a little water to a paste it will set hard in a few minutes.

Blackboard chalk is made of plaster. One type of hard water owes its hardness to calcium sulphate. Such water is called 'permanently' hard because boiling will not soften it.

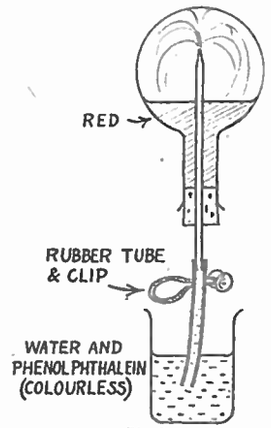


Fig. 3

Chalk, or calcium carbonate, may also be precipitated from calcium chloride solution by adding to it sodium carbonate (washing soda) solution until no further white insoluble calcium carbonate forms. Wash the product on the filter, and shake up a little of the paste with water in a test tube. Dry the remainder in the oven for your chemical stock.

Calcium Bicarbonate

If you now bubble carbon dioxide through the calcium carbonate suspension in the test tube, the milky liquid will soon become water-clear. When it does so, stop passing in carbon dioxide.

You now have a solution of calcium bicarbonate which is the cause of the

(*Continued on page 318*)

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LONELY? Then write the Secretary, U.C.C.—5 B.B. Hay St., Braughing, Herts. Genuine. Est. 1905.

HAVE you got your Juneero Riveting Jig yet? From all hobby shops or Post free from Juneero Ltd., Stirling Corner, Boreham Wood, Herts.

STAMPS Free—Empire Packet including Pictorials and Victorians free to approval applicants.—Robert J. Peck, 7A Kemp Road, Bournemouth, Hants.

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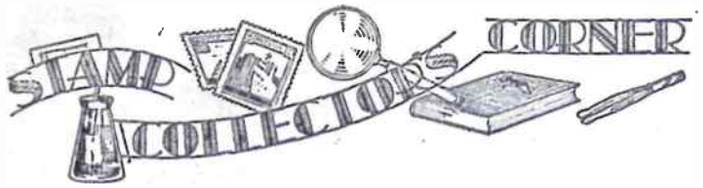
100,000 Government Surplus Bargains. Single toggle switches, 20 amp., 9d., post 3d. 5-way junction boxes, 9d., post 3d. 70 ohm variable resistances, 9d., post 3d. Steel ammunition boxes, ideal tools, etc., 12"×7"×6", with hinged lid, 2/6, post 1/3. Aluminium rivets, approx. 1 lb. assorted, 2/6, post 6d. Send 3d. stamp for list of other bargains, motors, grinders, etc. Money back guarantee.—Milligan's, 24 Harford Street, Liverpool, 3.

MAHOGANY plywood, new, any parcel £1 delivered C.W.O. 4 at 72×11½×4 mm., 7 at 78×8½×4 mm., 12 at 78×5½×4 mm., 8 at 72×6½×¼in., 6 at 78×8½×¼in., 10 at 78×5½×¼in., 22 at 88×3½×¼in., 24 at 78×3½×¼in., 40 at 78×2½×¼in., 50 at 78×2×¼in.—Leader (1920), Gosford St., Middlesbrough.



WINTER SPORTS ON STAMPS

THE Winter Sports season has been taking place all over the world. Sports which are held only amid snow and ice have always been exciting ones and perhaps ski-ing has the greatest appeal.

How many of us can truthfully deny that at some time or other in our lives we have longed to don a pair of skis and perform one of those magnificent leaps?

It is not as easy as that, however, as ski-ing is one of the most difficult sports in which to attain proficiency. Perfect body control is essential.

Developed in Norway

The sport began to develop in Norway in the middle of the nineteenth century and spread all over the world by the early twentieth century. Many countries have used ski-ing designs for their stamps.

Austria commemorated the International Ski Championship in 1933 with a special issue of four stamps depicting the climb, the start, the race and a ski jump. Poland marked the International Championships at Zakopane in 1939 with a set of four values showing a Polish skier.

The Chamonix-Mont Blanc Ski-ing Week was commemorated by France in 1937 by the issue of a 1f. 50c. stamp bearing a drawing of a ski-jumper.

The 1949 Ski-jumping Competition at Planica was the occasion of a special issue of two stamps by Jugoslavia depicting the ski-jump at Planica and a ski-jumper. The 200k. of the Hungary 1925 Sports issue depicts ski-ing. Roumania chose the sport for one value of the 1937 set commemorating the Seventh Anniversary of the Accession of King Charles II and for one value of the 1945 Charity set. A ski-jumping scene can be seen on one value of the Roumania 1946 Sports issue.

The 1948 Olympic Games at Wembley were celebrated by Monaco with a special issue. One stamp shows skiers. Finland issued a set of three values to mark the International Ski-ing Contest at Lahti in 1938. These stamps depict long distance ski-ing, ski-jumping, and a downhill ski-ing contest.

Czech Issue

The 1950 Tatra Cup Ski Championship was the occasion for the issue of three stamps by Czechoslovakia. A ski-runner is the subject chosen by Switzerland for one value of her 1948 Charity set. Ski-ing has now extended to far-away Japan, which issued a special 5y. stamp in 1949 to commemorate the Fourth National Sports Meeting at Sapporo, Hakkaido.

Russia has always been one of the homes of ski-ing. She celebrated her 1935 Spartacist Games with a special issue containing one value showing ski-running. Stamps showing the sport can also be found in the 1938 Soviet Sports issue, the 1948 R.S.F.S.R. Games issue, and the 1949 National Sports issue. The Russion Zone of Germany devoted one stamp of the pair marking the First Winter Sports Meeting in 1950 to a skier and one of the pair issued to commemorate the Second Winter Sports Meeting in 1951 to ski-jumping.

Ice skating is believed to have originated with the early Norsemen, who tied strips of bone underneath their feet. Steel skates were introduced into England from Holland in the early seventeenth century. Artificial ice-rinks were first opened in 1876 and since that time the sport has become decidedly more popular. Many contests are held today for speed and figure skating.

Hungary chose skating for the 300k. value of her 1925 Sports issue. A boy skating is shown on one value of the Netherlands 1948 Child Welfare Set, whilst the Russian Zone of Germany shows a girl skating for one value of the 1950 issue commemorating the First Winter Sports Meeting.

Russia shows skating on one stamp of her 1935 Spartacist Games issue. Japan issued a 5y. stamp in 1949 in honour of the Fourth National Sports Meeting at Suiva City. This stamp depicted a skater.

The game of ice-hockey had its origination in a game called 'Bandy', which was played in the Fen country over a hundred years ago. It is now the national game of Canada and is generally claimed to be the fastest game in the world.

Switzerland honoured ice-hockey by depicting a scene from the game on one value of her 1948 Charity set, and another scene from the game can be found on one value of the Russia 1949 National Sports issue.

Tobogganing

Tobogganing is of Canadian-Indian origin, but is now famous for the magnificent contests held on the tortuous Cresta Run near St. Moritz, Switzerland.

One value of the Netherlands 1948 Child Welfare set shows a boy on a toboggan. The Russian Zone of Germany chose tobogganing for one value of the 1951 pair commemorating the Second Winter Sports Meeting at Oberhof.

One of the greatest honours open to winter sportsmen is participation in the Winter Olympic Games. The United States issued a special 2c. stamp in 1932 showing ski-ing to commemorate the Winter Olympic Games held in that year. The Fourth Winter Olympic Games was held at Garmisch, Germany in 1935. A set of three stamps was issued by Germany for the occasion. The 6pf. depicted skating, the 12pf. depicted ski-jumping and the 25pf. showed bob-sleighing. Austria honoured the Fifth Winter Olympic Games held in 1948 at St. Moritz with a special stamp illustrating the Sacred Olympic Flame. (263)

HOME CHEMISTRY

(Continued from page 316)

so-called 'temporary' hard water. Pour half into another test tube, add a few drops of dilute soap solution and shake. A white scum and very little lather forms.

Boil the contents of the other test tube. The liquid will become milky again due to reformation of calcium carbonate. If you now add a few drops of soap solution and shake, a good lather forms but no scum. This experiment shows why temporary hard water becomes soft by boiling.

Calcium carbonate is the chief constituent of egg shells, sea shells, marble, limestone and many rocks. Stalactites and stalagmites are also calcium carbonate and are formed by dilute calcium bicarbonate solutions percolating through the rocks and decomposing into calcium carbonate when they evaporate in the caves. (268)

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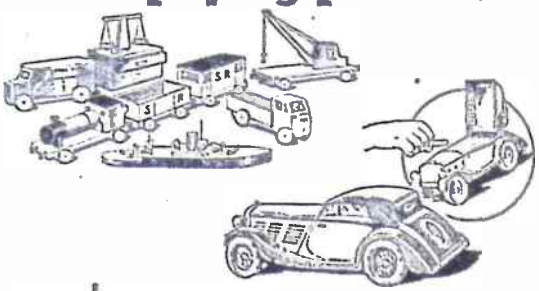

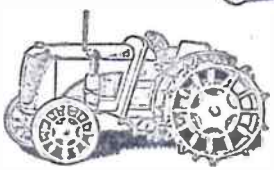

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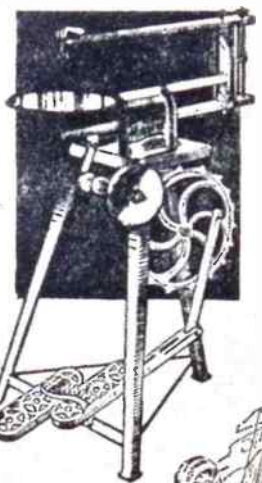

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