

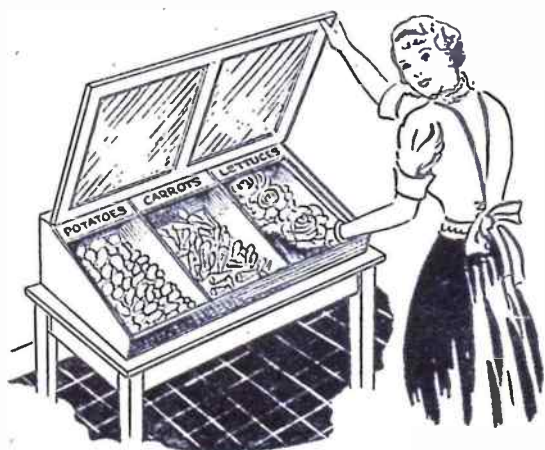
Hobbies

WEEKLY



VOL. 115

NUMBER 2979



You can make a handy VEGETABLE STORAGE CABINET

IT'S ALSO
USEFUL FOR
DISPLAY

you make up the correct total width. Notice in Fig. 1 that the battens stop $\frac{1}{2}$ in. short from one side. This will be the back of the floor and will rest on the piece (C).

Now turn your attention to the sides. Two of these are required and they are cut from $\frac{1}{2}$ in. plywood or hardboard. All the necessary measurements are shown, but unless you are used to setting out drawings you need to know how to proceed.

THE vegetable cabinet shown here is designed especially for the housewife. Stood on a table or shelf it gives easy access to vegetables or fruit. The floor slopes toward the front so that such things as potatoes will roll forward as they are used. The size of the cabinet is 36ins. long with two partitions, but it can be extended and divided into any desired number of compartments.

The Floor

Take several boards (A) of $\frac{1}{2}$ in. thick wood and join together by three battens (B) of the same material, so that the total width is 24ins. It does not matter how many boards are used so long as

Setting Out

Draw the line of the base first, 24 $\frac{1}{2}$ ins. long and erect your drawing upon this. Draw a perpendicular at the right-hand side and mark off 3ins. and 15 $\frac{1}{2}$ ins. as shown. You can make a right-angle by using a set square, a protractor or a stiff-backed book.

At the top right-hand corner another line, 3 $\frac{1}{2}$ ins. long is drawn at right-angles to the perpendicular line. From the point marked (Y) on the drawing (Fig. 2) describe an arc of 3 $\frac{1}{2}$ ins., radius

Display

For display purposes the lid should be glazed, but this is optional with the household article. The cabinet can be used for displaying fruit or vegetables in a shop and the contents suitably labelled and priced. Prices should be large enough to be seen through the glass.

IN THIS ISSUE

	Page
Vegetable Storage Cabinet - - -	145
A Smoker's Stand - - -	147
You, too, can be the Life of the Party this Christmas - - -	148
A Garden Litter Truck - - -	149
Novelties for Christmas - - -	150
Replies of Interest - - -	151
A Monitor For Model-Control Transmitters - - -	152
Make Yourself a Handyman's Aid - - -	153
Enlarging by the Square Method - - -	154
Carbon Dioxide Used in Experiments - - -	156
About Oriental Woodwork Tools - - -	158

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



THE MAGAZINE FOR MODELLERS,
HANDYMEN AND HOME CRAFTSMEN

A Smoker's Stand

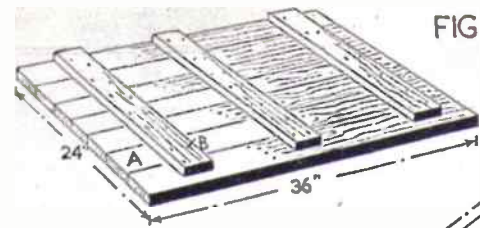


FIG. 1 (ABOVE)
MAKING THE
FLOOR

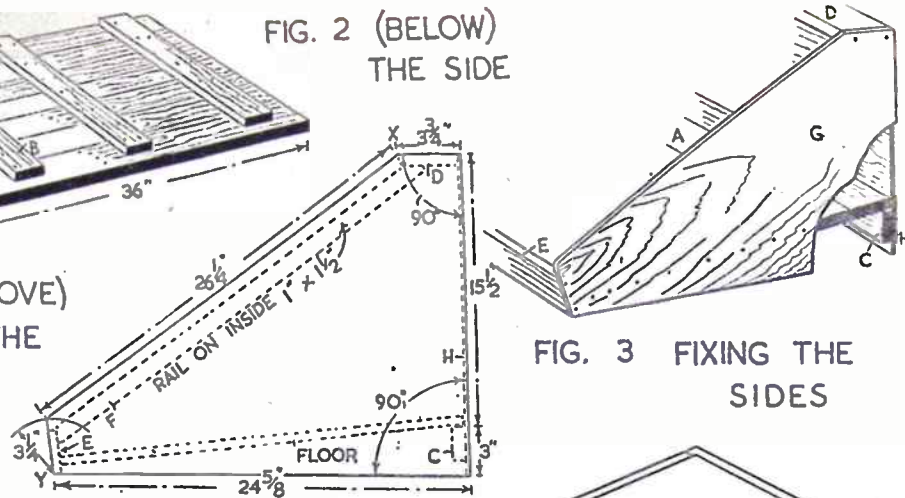


FIG. 3 FIXING THE
SIDES

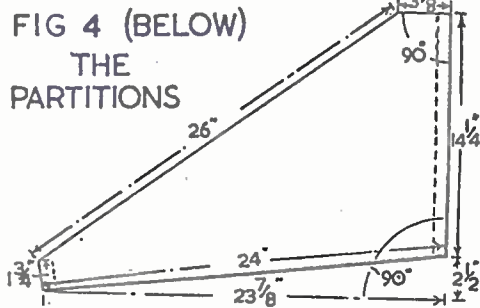


FIG. 4 (BELOW)
THE
PARTITIONS

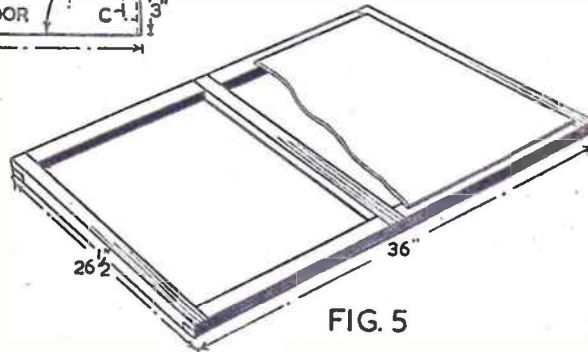


FIG. 5
THE LID

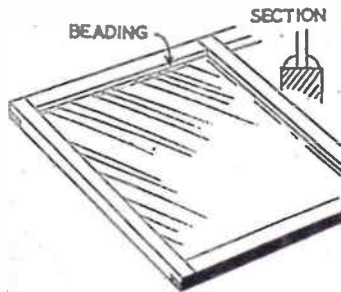


FIG. 6 GLAZING

with a compass. Next take a piece of string and pivot at (X), that is the end of the top line 3 1/2 ins. long, and mark off on it the length 26 1/2 ins. Pull the string taut and see where the 26 1/2 ins. mark cuts the 3 1/2 ins. radius arc that you have described with the compasses. Join up the lines as shown and the shape is complete. The drawing can, if you like, be made direct on to the wood, using

one side as the base line.

The three rails (C), (D) and (E) are all 36 ins. long, (C) and (D) being cut from 1/2 in. wood, and (E) from 1 in. The widths are as follows: (C)—2 ins., (D)—3 1/2 ins. and (E)—2 1/2 ins. Nail the sides to these three rails and then nail the floor in position as shown in the cut-away view at Fig. 3. The back, piece (H), is pinned to (C) and (D) as shown in Figs. 2 and 3.

The partition, Fig. 4, is of similar shape to the sides, the measurements only varying slightly. Mark them out in the same manner as the sides. The partitions are held in place by fillets, that is strips of wood, about 1/4 in. by 1/2 in. section, glued and pinned on either side.

The Lid

Construct a solid frame-work of 2 ins. by 1/2 in. material as shown in Fig. 5. The frame should be strengthened by at least one cross rail and the joints should be halved together as shown. Glue and screws are used for securing the joints. For household purposes the lid can be covered with 1/2 in. plywood or hard-board. Round off the edges neatly

before pinning in place.

Glazing for Display

The glass is cut to size and held in place by 1/4 in. quarter-round beading glued and pinned in position. The beading will be on each side of the glass as shown in the section of Fig. 6.

To strengthen the sides, and form a rest for the lid, two rails (F) are screwed in position as shown in Fig. 2. They should be 1/2 in. down from the edge. The ends should be trimmed to fit in with rails (D) and (E).

The hinges are screwed to the top of rail (D) and to the top of the lid frame. Ordinary butt hinges should be used. Mark their positions in pencil and then cut slight recesses with a chisel. The hinges will then be let in flush with the surrounding surfaces.

Drill about twelve to twenty 1/4 in. holes in a row along the back. They should be fairly near the top, with another row along the bottom. This will ensure the free entry of air and will keep the vegetables or fruit fresh. Cover the holes with a strip of perforated zinc

(Continued on page 158)

THIS rather unusual design of a smoker's stand is intended to obviate, as far as possible, the untidy appearance caused by accumulation of loose ash and cigarette ends. In place of the usual tray, a kind of metal chute is substituted, down which the ash and cigarette ends fall into a receptacle beneath and are thus hidden from sight.

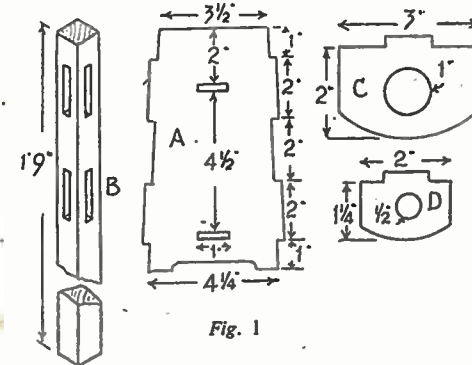


Fig. 1

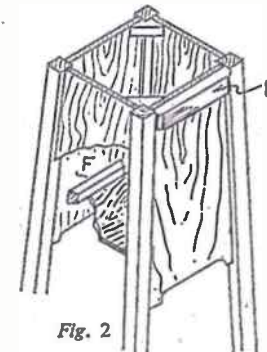


Fig. 2

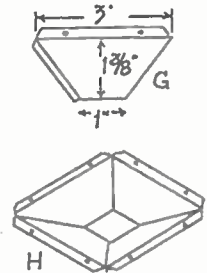


Fig. 3

The article can be made from any wood available though, of course, a hardwood such as oak, would make a more pleasing piece of woodwork. Most of the parts are grouped together in Fig. 1. Cut four of the panels (A) from 1/2 in. fretwood or plywood. The latter can now be bought faced with oak, and looks well, as well as the solid wood, in fact. Cut to the dimensions

given, and allow 1/4 in. extra each side for the tenons. In two only cut out the mortise slots seen in the drawing. The width of these should suit the thickness of wood used to make parts (C) and (D).

The Legs

The legs (B), four of which are required, are cut to the length given from 1/2 in. square wood. If you have to cut these from deal, take care to select wood free from knots and shakes. In two face sides of each leg, chisel out mortises to suit the tenons of the panels. These can easily be marked off by laying the panels over the legs and pencilling across the ends of the tenons. Now glue together in pairs, fitting the panels with the mortise slots to their respective legs. Note that the top corners of each tenon need to be bevelled off a little to fit in satisfactorily, owing to the splay of the legs. Clamp up tightly, and lay aside for the glue to set.

From wood about 1/2 in. thick, cut two each of parts (C) and (D), and cut the tenons to suit the mortise slots in the panels. A tight fit is desirable here. In (C) bore out a 1 in. hole about where shown, and a 1/2 in. hole in (D). Glue these parts in position on the panels, parts (D) in the top slots, and turn

room for the metal ash container to be dropped in. A suitably-sized tin will serve quite well for this, about 5 ins. long and 2 1/2 ins. diameter; a coffee tin for example. On one side only glue across a strip of wood 1/2 in. thick and 1 in. wide, as shown at (E). This is for a pair of hinges to be fitted on, to allow the top of the stand to be lifted up when it becomes time to empty the ash container.

Inside the carcass, at 5 1/2 ins. down from the top, glue across 1/2 in. square strips of wood, as at (F), one each side. To these, when the glue is quite hard, a bottom piece of three-ply is screwed, to act as a support for the ash container to stand upon. For the top of the stand a square of solid wood can be used, measuring 6 ins. each way, or if deal has to be employed, a frame of 1/2 in. by 1 1/2 in. wood instead. In the solid top, a central square opening 3 ins. each way should be cut out to receive the metal chute already mentioned. The framed-up top will, of course, already have this opening.

Finishing the Job

Now clean up the whole work. While finish is a matter of personal taste, it is suggested that a light oak stain and one or two coats of copal varnish would suit well an article of this

description. It must be added that the bottom ends of the legs need to be bevelled across a little to stand firmly on the floor, owing to the slope, of course. This also applies to the tops of the legs, to allow the top part of the stand to close properly down. Both points will probably occur to the reader himself, as far as that goes, but the matter is mentioned.

When the glue is quite hard, stiffen the structure with corner blocks, as shown in Fig. 2. Quite small blocks should be used here to allow of sufficient

(Continued on page 148)

Prepare these tricks now, then—

You, too, can be the Life of the Party this Christmas

HERE are some amusing tricks with which you can puzzle your friends this Christmas.

An Omelette Without Eggs

Effect:
An empty frying-pan is passed around your audience for inspection and afterwards placed on a lighted spirit lamp. The empty pan is then stirred slowly with a wand and an omelette is produced.

The trick:
This is much simpler than it seems. All you need is a hollow wand, material for an omelette, a small frying-pan and a spirit lamp. The ingredients for the omelette are secreted within the wand and the end blocked with a lump of stiff lard or butter. As you stir, the heat from the frying-pan will melt the fat and allow the beaten egg, etc., to run down the tube into the pan. If the wand is clean you can add to the effect by eating the omelette after it has been cooked.

The Disappearing Watch

Borrow a watch from one of the guests, cover it with a handkerchief and pass it around amongst the spectators, inviting each of them to reach under the handkerchief to feel the watch. This will convince them that it is still there right up to the last minute. When the hanky is handed back, you casually drop it on the floor. A dreadful crash will bring the lender rushing to the hanky but all he finds on the floor is a ring of keys. The watch is reproduced by passing the hanky around once more.

The trick:
The last guest to reach under the handkerchief is your confederate. He removes the watch as he pretends to feel it and returns the empty handkerchief. It is a simple operation for you to palm a key ring while the watch is being examined and you hold this in the hand in which you take back the hanky. Naturally, when reproducing the watch, your assistant in the audience is the first person to examine the hanky.

Something New

Tell your guests that you are going to show them something that has never been seen before, and which, after all have seen it, will never be seen again.

This is done by cracking a nut, displaying the kernel, and then eating it.

Lighting a Candle with your Finger Tip

For this trick you will need a small piece of white metal potassium. It should be only $\frac{1}{4}$ in. long and the thickness of a pin. Slip it in the wick of a candle until you are ready to perform, and then, unobserved, wet the finger in a saucer of water and touch the wick which will immediately light. A cigarette may be lit in the same way.

Hanging a Hat on a Door Panel

Sharpen a polished pencil towards the side instead of in the normal way. When you make your entrance into the drawing room or parlour, rub the pencil smartly down the side of the door. Static electricity will hold the pencil firmly to it and a hat with a flat brim can be hung upon the pencil.

The Wind-proof Candle

Effect:
A candle is lit by the performer and the guests are invited to blow it out. However much they try the candle still remains alight.

The trick:
A thin linen rag which has been well saturated in a strong solution of common salt is rolled round an ordinary candle. It will burn even if placed in the open in a strong wind.

The Vanishing Coin

Effect:
A coin is dropped by one of the spectators into a glass of water. It passes right through both the glass and the table on which it stands and is produced under the table.

The trick:

The secret lies in a glass disc the same size and thickness of the coin to be used. Any glazier will cut it out for you quite cheaply. After the guests have all examined the coin in order to identify it later, palm the disc in the right hand, take the penny in the fingers and cover the hand with a handkerchief. Under cover of the hanky palm the penny and replace it with the glass disc. Hold this in position over the glass of water. Now ask somebody to hold the coin which is still covered by the hanky and to drop it into the glass when you give the word.

The coin is heard to fall to the bottom of the glass but when the hanky is removed the coin has gone. The right hand which contains the coin is held under the table and the coin produced. To complete the effect, pour the water carefully out of the glass. The disc will stick to the bottom and cannot be seen. (T.P.-F.)

Confusing Crystal Set

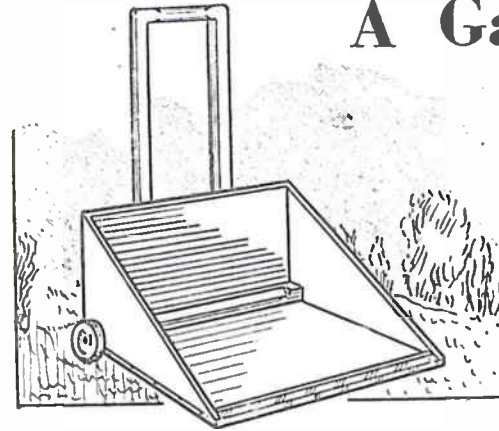
CAN you please explain why it is I get no results at all from my crystal set when attempting to use it out of doors? I obtain excellent results with it indoors. I might add that I use a good copper aerial and earth wire. (G.L.—Whalley Range).

SUCH receivers will operate equally well out of doors if the aerial and earth are satisfactory. If you are using the same phones, then the fault must lie in the aerial-earth system employed outside. Possibly the aerial is too low, or in contact with some earthed object, or much too short. Also see that the wire is not broken inside the insulated covering. Or the earth lead may be broken, or not connected properly. As the receiver works well indoors, satisfactory results should be obtained outside, with a metal spike pushed into the ground for earth, and a length of wire erected as convenient for aerial.

metal and cut out either with a cold chisel or a metal cutting saw blade. Use this like a template for marking out the other three required. Bend the side flanges over at right angles, and then solder all four together, the result being as shown at (H). Bend the top flanges outwards, punch holes in them, and nail or screw to the stand top. (W.J.E.)

EASY TO MAKE—AND USEFUL

A Garden Litter Truck



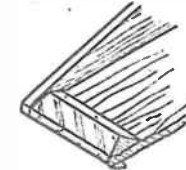
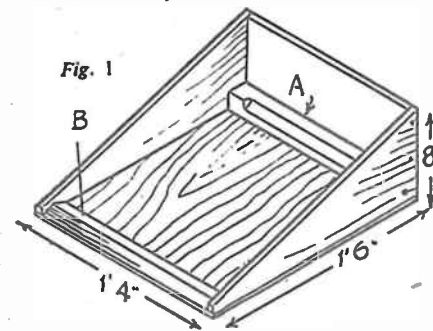
end, and acts as an axle bar for the wheels. It will be wise here to add a screw or two through the ends of the truck to this bar, and one or two might with advantage to strengthen, be driven in through the plywood bottom as well. Now trim the outside edges of the plywood level with sides and ends of truck. Take a piece of wood, 2 ins. wide and $\frac{3}{4}$ in. thick, and bevel it down each side to a feather edge. This is glued to the truck.

THIS handy little truck will be found most useful in clearing away the litter—dead leaves, etc., which accumulates in the garden. Though small and light in weight, it yet holds a lot of stuff, and is so designed that it lies almost flat so the litter can be swept in easily, and trundled away. Dead leaves and such-like stuff, weigh little and this truck could be handled by a youngster and enable him to be a real help in the garden.

The truck body is shown in Fig. 1

touching the front edge, as at (B). A few small screws are driven in this through the plywood bottom. It protects the edge of the truck and acts as a deterrent to the litter tending to tumble out when the truck is tilted forward to sweep up further rubbish. As this part has to stand some wear and tear from the action of the broom, it will be as well to cover it with sheet metal.

Reasonably thick tinplate would serve, though stouter material would naturally last a lot longer. A strip 3 ins.



with useful dimensions. The sides and ends can be cut from wood, say $\frac{1}{2}$ in. thickness, no need to use anything stouter. The bottom of the truck can be plywood, $\frac{1}{2}$ in. thick, the cemented kind if obtainable, as this is not so susceptible to damp conditions and will last longer. It will be noted the sides slope, not quite to a point, but to a flat of $\frac{1}{2}$ in. Screw the sides and end firmly together, cut the plywood bottom and nail it to both.

Axle Bar

In the rear bottom corner, glue and nail a $1\frac{1}{2}$ in. sq. strip of wood, (A). This is stop chamfered to within 1 in. of each

nail 1 in. wide strips of the sheet metal to cover the joints between plywood and sides and end of truck, as in Fig. 3. This will greatly strengthen the whole construction. A detail of the handle is given in Fig. 4. Wood, 1 in. square is suggested for this, and the length given, which is about suitable for a youngster, can be extended if an older or taller person is more likely to use it. The top crossbar, forming the hand grip, is halved to the upright, as in the drawing, and screwed for strength. It is neatly rounded off for the main part of its length for comfort in handling. Screw the uprights of the handle to the end of the truck, then file off the outside sharp edges of the 'grip'.

Wheels

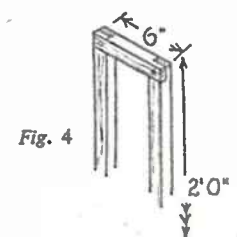
A pair of 4 in. wheels will serve for the truck, as it must be raised from ground level only just enough to enable it to be wheeled with ease. Drive the axle screws through the truck side into the centre of the bar (A). Interpose a washer between each wheel and the truck sides to minimise friction, and see the wheels move freely without scraping against the strip metal over the bottom joints. A pair of washers could be used if necessary, or a thick iron one, if scraping occurs.

The truck could be creosoted as a preservative against the weather, and the metal parts given a coat of black enamel.

If for Children

If made as a useful present for a youngster, then remember children love something gay in appearance, so a coat of glossy paint of a brilliant hue will make the truck doubly welcome. A combination of colours would look well, say green and red, or blue and yellow, anything in fact the more conspicuous and glaring the better. (W.J.E.)

(Details of a useful Garden Rake are due soon)



A Smoker's Stand

(Continued from page 147)

Fig. 3 gives a pattern (G) of the metal chute. This can be cut from tinplate and afterwards enamelled, but a much superior appearance results if it

is cut from sheet brass or copper. Draw the pattern on thin paper, and allow $\frac{1}{4}$ in. extra for the top flange, and $\frac{1}{2}$ in. extra for the side one. Gum to the

Start now making

NOVELTIES FOR CHRISTMAS

CHRISTMAS novelties are always expensive to buy because they carry a Purchase Tax of 100 per cent. Therefore, it will pay you to make up practical and attractive ideas with oddments, either for your own use or to sell to friends.

Rooms always look so bare at Christmas time for the want of sprays of foliage. I have found these good sellers and larger sets have been sold to retailers. Here is how to make them.

Gather up suitable twigs, all clean

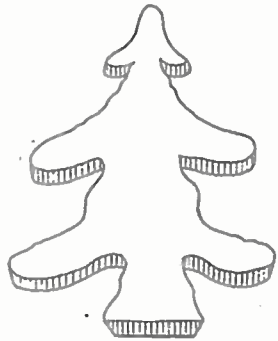


Fig. 1

and well shaped. Have them between 18ins. and 24ins. long. Paint these up in old bronze, aluminium or black. Collect beads, acorns, tufts of gaily coloured rug wool, berries, pine cones and even toffee papers (free from advertisement) and make up your sprays. Pine cones can be bright red, tipped aluminium. Acorns can be in yellow or blue. In making these sets up you will find a kit of small enamels very handy. You can get florists wire at any art and craft shop or a florist will oblige you.

Grotesque Tree

If you are handy with the fretsaw, you will find that people will gladly buy a small Christmas tree on which they can hang the smaller gifts. Christmas trees are likely to be very dear, but the idea shown here will appeal to many. Design it on some hardboard. You can get this at any timber yard, in unlimited quantities at about 8d. a square foot. Special sizes are a little dearer.

As you will see in the sketch the tree is of rather an unusual shape and quite grotesque. It will be heavily coated with flat white paint or thick whitewash and the deep green will only show on the lower edges. I have tried this idea

out also with luminous paint. This idea, perhaps a little larger, may appeal to retailers in your district. Such a novelty may mean you picking up orders for other window display fittings. I have made very valuable contacts this way.

Better Received

Small gifts at Christmas are always better received if served up in a novel way. Apart from the large gifts, there are always attractive little novelties which the members of the household like to give. Wrap these up in some tissue paper so that they are well rounded off. Then again wrap in cotton wool, neatly, and tie up with tinsel tape or seasonal thread. Attach a ticket for the name, and paste on some dabs of glitter powder. Just a sprig of holly or mistletoe will finish off the idea. Set them up in a bowl on the table so that each member can take his allotted parcel.

Never despise the small cartons in which you get ice cream. These paint

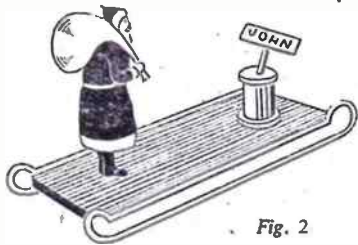


Fig. 2

well, and packed with tissue paper one can set little gaily painted pine cones in them. Drill a hole to take some 1/4in. dowel and then insert in the pot. By making a small slit in the cone one can

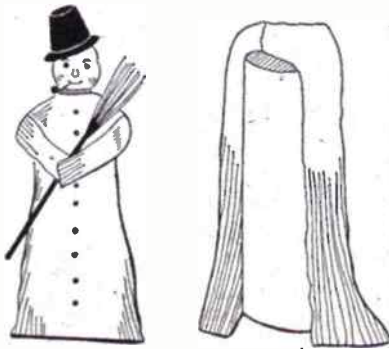


Fig. 4

make these into novel and attractive place markers for a party.

Another idea for place markers can be made up with odd bits of wood and cardboard, and these are a great novelty for the children's party. All you

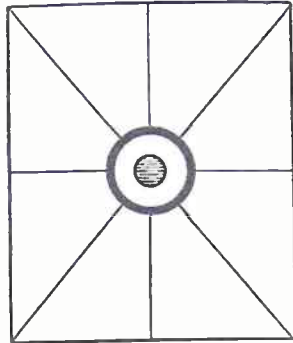


Fig. 3

need is a piece of thin wood about 1 1/2ins. wide and 4ins. long. I have used the thin boards off an orange box for this. It is light, soft and glasspapers down well. On the sides you will see the edges of the sledge in cardboard. A little Father Christmas can be cut out in plywood and added as shown. To get ideas for figures for these I buy a few toy cut-out books and here you will find gnomes and elves and all the queer people the children love. Such books also give you splendid ideas for colouring, and are well worth their money as a valuable reference work.

Another version of this idea is to fix a brightly painted cotton reel to the opposite end to the Father Christmas. With a paper fastener you can then fix a name card for the party table.

Decorating

Decorating the room is always an adventure but I do like to see more planning in these ideas. So many rooms look pretty in an untidy sort of way. Low hanging chains are dangerous and spoil the lay-out completely. In my sketch I show a much better plan and here I have made use of a small wooden child's hoop which is suspended round the centre lighting unit and held back to the corners with thin wire attached to the picture rail.

By this means you have an orderly plan, plenty of strong supports for globes, bells and other novelty ideas

(Continued on page 151)



Hole in Pewter Teapot

I WOULD be grateful if you would tell me how to repair a hole in a pewter teapot. (J.D.—Wavertree).

If the hole is small, a repair could possibly be effected by inserting a piece of soft pewter of approximate size and shape, and then hammering it into position. A larger hole would need filling by an accurately fitted piece of pewter sheet and the joint fused or soldered. The whole operation calls for considerable dexterity and skill, and the necessary implements with which to carry out the work.

Trouble With Polish

I HAVE a console radio cabinet which I has apparently been stored for some time under adverse conditions, and the finished surface, which appears to be polished veneer, is rather badly cracked and now has a mottled appearance. I understand there is some preparation which can be applied to the surface to soften the cracked polish or varnish and it can then be re-surfaced or re-polished. I have no experience of finishing surfaces of furniture, or french polishing, and your help with this problem will be most gratefully received. (H.H.—Kingston Hill).

THERE is a proprietary brand of paint and varnish remover, 'Stripit', which, used according to the directions will remove the old polish, after which it should be lightly glasspapered and repolished. As the art of polishing is strange to you, it would be safer to apply a coat or two of brown hard spirit in a warm room. A good finish can be obtained afterwards by soaking a handful of cotton wool in French polish, covering it with a clean rag, and then, after squeezing it well, to go over the varnished surface lightly to bring up a better gloss.

New Handles

I HAVE an old bill-hook blade which I wish to sink into another handle. I have the same problem with a knife. In each case I cannot make it so that it stays in firm. I hope you can help me. (M.W.—Mildenhall).

TO fix a bill-hook or other blade to a wooden handle, the first thing is to see that the tang is straight and true, also that it tapers nicely and is free from rust. Next, if the handle already has a hole in it, that is larger than the tang, open it out and glue in an accurately fitting plug of tough wood that completely fills the hole. Leave for a day to allow the glue to set properly. Next drill out or form a tapered hole that conforms accurately to the shape of the tang. This is the really important part and some users advocate making the tang red hot at the tip to driving it into the wood. Whichever way it is done, make sure the tang really fits the slot on all four sides, but leaves an inch or so to drive down, which can be done by sharp heavy blows with a hammer.

Electricity from Waterfall

I AM considering utilizing a fairly big waterfall approximately 100 yards from the house, for obtaining electrical power. Could you give me any advice how to set about it? (C.W.—Hexham).

YOU will apparently need to make up your plant from such materials as can be pressed into use. For maximum power the waterwheel should be of a diameter at least equal to the height of the falls, and have buckets large enough to hold the whole of the water flowing. Two large discs made from boards, with boards nailed between, are suggested. A drive providing a fairly high step-up ratio would be necessary between waterwheel spindle and dynamo. Roller chain and V-belt drives are suggested. Formula for calculating the horse-power of the fall can be found in text-books, the power depending upon the height of the fall and the volume of water flowing. The overshot type of wheel is regarded as providing the most power; the breast wheel is second, with the undershot type of wheel providing least power, but being simpler to construct. A further type exists, generally known as the Pelton Wheel, this runs at higher speed and is primarily intended for falls where there is a high head of water, but comparatively small flow. It is suggested you refer to works upon the subject, which would normally be available through your free C.C. library.

Cleaning Coins

CAN you give me any hints on cleaning up my coins? I have used Prussic Acid but wish to clean them indoors and that way is a bit dangerous. (G.R.—Stratford).

ON no account should you use Prussic acid for cleaning your coins; it is deadly poison and not at all suitable. Most old coins can be cleaned by washing and scrubbing with a good detergent—for example, the domestic 'Tide', and washing in clean warm water. Follow by rubbing with any good metal polish. If this is not adequate, then use a very weak solution of hydrochloric acid and wash off thoroughly with clean hot water.

Painting a Table Tennis Table

IS it necessary to use a special type of paint on the playing surface of a table tennis table? (F.W.—Saltburn-by-Sea).

NO special paint is needed, but a dead flat surface is certainly desirable. Scrape off the remains of the old paint and glasspaper quite smooth. Apply a suitable undercoat and then a finishing coat of good quality flat paint. We can recommend 'Flatolac', a 'Bro-lac' paint, drying with a flat satin surface. Use the special undercoat for the green colour, and do not forget the 1/4in. white border—this is important.

Novelties for Christmas

(Continued from page 150)

and, by adjustment, you will not cover up the light too much. Cover the hoop with crushed crepe paper and finish with tinsel, arrange your bells to correspond with the wire supports and then loop your chains from wall to hoop edge. This shortens the expanse and keeps them poised better. Incidentally, the hoop makes an ideal

support for strings of fairy lights.

Do not leave window ledges bare and uninteresting. You can make a snowman from white crepe paper. All you need do is to shape his body and head up with newspaper as a filler and rolls of crepe paper on the outside of the newspaper. To get into shape, use some thin string and make a slipknot. Draw

in to shape and tie. Finish off the body with a layer of cotton wool. This idea is shown in the sketch. Use black paper for his buttons, eyes and other features. He must have a good top hat and you can make this as shown. This can be made from thin cardboard.

You can make him a mystery snowman on a cardboard tube, as shown. Just the idea to bring out when the party is going well, and extract little gifts for the children. Pack the gifts in tissue and force into the tube. (V.S.)

A Monitor for Model-Control Transmitters

THIS unit serves several purposes for the constructor who is building or using model-control radio equipment. It functions by actually picking up part of the radiated signal. Accordingly, it shows whether the transmitter is operating satisfactorily, and also enables the frequency to be checked. The relative efficiency of different aerials can also be found, and by its use transmitters which are not of the crystal-controlled type can be set to the correct frequency.

The circuit is shown in Fig. 1, and is very simple. The whole unit is built in a small box which can be held in the hand, a terminal at the side permitting an aerial to be attached. For this, a short, stiff wire 6ins. to 12ins. can be used. The actual strength of the signal picked up is shown by the meter. Two terminals are also provided so that headphones can be wired in, if required, to listen to the note from a modulated transmitter.

Components Required

The capacity of the tuning condenser is not critical, but should not be too

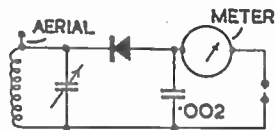


Fig. 1—Circuit of the Monitor

high, or tuning will be difficult. A capacity of .000025 mfd. (25 pf.) is most suitable, though .00005 mfd. (50 pf.) would do. Alternatively, it may be possible to dismantle an existing condenser, reassembling it so that there is only one fixed plate. The condenser should be of fairly solid construction, and equipped with a pointer and scale or graduated dial, so that accurate readings may be obtained. No reduction drive is necessary.

The detector is one of the well-known crystal diodes; that shown in the wiring plan is wire-ended, but the type of diode which is held in clips would do equally well. If the wire-ended type is used it is recommended that the wires are not cut short, or the diode may be harmed by the heat from soldering. The type intended to be held in clips must not be soldered.

The fixed condenser provides a path

for radio-frequencies. Any capacity between about .0005 mfd. and .01 mfd. is suitable. The unit will also operate in many instances with this condenser omitted. (This depends upon the characteristics of phones or meter used).

The meter used in the original Monitor was a 50 microamp one, but other meters can be used. It is essential, however, that the meter be one which only requires a small current, otherwise readings will only be obtained very close to the transmitter. A 100 microamp meter would do well. Meters of less than 50 microamp deflection would be more sensitive. It is not necessary that the meter be of any particular rating, or even that its deflection be known. Accordingly, a movement from ex-service equipment may be used, and that actually employed was taken from a glide-path unit. In the event of a meter with a larger deflection being to hand, this can be tried. But meters with a full-scale reading of over .5 to 1 mA (500 to 1,000 microamps) are not very suitable, being comparatively insensitive.

The coil is wound from 20 S.W.G. tinned-copper wire (bare). A length should be pulled quite straight, and wound tightly round an object to form twelve turns 1in. in diameter, the whole coil being 1½ins. long. The object is then removed, the coil being self-supporting.

Constructional Details

The size of the case will depend largely upon the size of the meter and tuning condenser. The small meter and condenser used in the Monitor made up could be accommodated in a case roughly 3ins. by 2ins. by 2ins. deep. The final dimensions of the Monitor are of

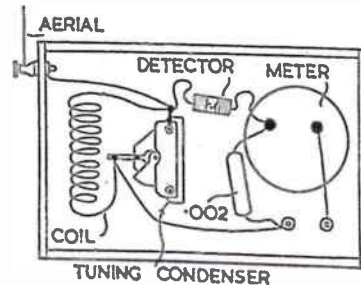
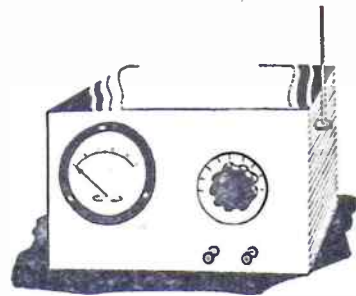


Fig. 2—Wiring plan



no importance. But some form of case is essential, in order that wiring and the coil are not subsequently moved, which would modify dial readings. The side upon which the aerial terminal is fitted should preferably be of paxolin sheet or other insulating material.

One or more aerials should be prepared. One should be retained unchanged so that it can be inserted in the aerial terminal for frequency-checks. A stiff wire 9ins. long is suggested, for this aerial; or a length of metal rod may be to hand. The aerial may be removed by loosening the terminal. Somewhat longer aerials can be made up to provide increased signal pick-up at greater range. However, tuning will be sharpest with the short aerial, and any change in the length of the aerial will influence calibration. When desired, calibration may be checked by using the original 9ins. aerial, and resetting the tuning condenser to its correct dial reading.

The back of the case should not be screwed into place until the Monitor has been checked, but must be added before finally writing down the dial readings.

Calibrating the Unit

If the crystal-controlled transmitter as described has been made up, this can be used to calibrate the Monitor. The transmitter should be switched on and the Monitor taken a few yards from it, and tuned. A point should be found where the reading on the meter rises sharply. This will be the 27 mc/s frequency, and the dial reading should be noted.

For these tests, the two phone terminals on the unit must be shorted with a piece of wire. If the reading begins to rise as the condenser is opened, but cannot be made to reach a definite peak, then stray capacity in the unit is a little high, and the tuning coil should be pulled out a ¼in. or so. If, on the other hand, the condenser seems to be fully

closed, the coil should be compressed a trifle. The back is then secured in place.

With a 2-valve transmitter operated from a 90 V. H.T. battery, a reading of 10 microamps was obtained at 25yds. Any improvement to the adjustments of the transmitter, or to the aerial, will be immediately apparent, since the reading on the meter will rise. Accordingly, the transmitter should be carefully adjusted to obtain the maximum possible reading on the Monitor meter. The effect of using different aerials on the transmitter will also be clearly seen.

Keep Away From Transmitter

The Monitor should not be taken near the transmitter, unless the aerial on the Monitor is removed, or the meter may be damaged due to excess current. Alternatively, the short wire across the phone terminals can be removed, to break the circuit.

If a transmitter is being used which is not crystal-controlled, it can be set to the correct frequency readily. The Monitor should have its aerial in place, and its dial set to the correct reading. The transmitter should then be tuned until the Monitor meter reaches the highest possible deflection.

At a range of a few feet from the transmitter, a reading of up to 250 microamps or more will be obtained, and meters which require a fairly large

current can be used at this range.

Calibration Oscillator

If no crystal-controlled transmitter is available, and the unit is to be used for checking the frequency of self-excited transmitters, calibration can be obtained by hooking up the circuit in Fig. 3. The coil consists of twelve turns of 20 S.W.G. wire on a 1½ins. diameter former, occupying a space 1½ins. long. The

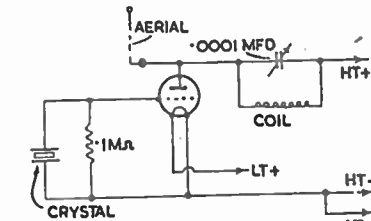


Fig. 3—Circuit for calibrating Monitor

H.T. battery may be 60 to 120 volts, and any triode valve in good condition will do. The crystal is a 9 mc/s piezoelectric one.

A meter should be included in the H.T. positive lead, and the .0001 mfd. condenser adjusted until the current reading falls sharply. Tune for minimum current, here. A short aerial (say,

12ins. of stiff wire) is connected as shown.

The Monitor aerial should now be brought near to the aerial on the oscillator, and the Monitor tuned until its meter shows maximum deflection. The deflection will not be large, because the Monitor is picking up a harmonic. The dial reading giving maximum deflection should be noted; this is 27 mc/s.

Other Uses

A reading will be obtained even if the transmitter does not radiate a modulated tone. If the transmitter employs a modulated tone, this can be heard by connecting headphones to the terminals. The note should be audible up to 50yds. or so range.

If a self-excited transmitter is being used, it may be found that the Monitor meter gives a higher reading when the dial on the Monitor is slightly away from the spot marked. If so, the transmitter is not on frequency, and should be adjusted a little at a time, by altering its tuning, until the Monitor gives its highest reading at the correct point on the dial.

Such a unit will be found very useful, since it immediately shows whether the transmitter is actually radiating or not, and the strength of the radiations.

(F.G.R.)

Some decorating to do?

Make Yourself a Handyman's Aid

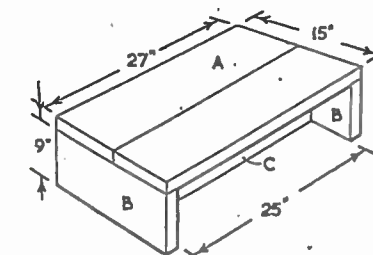
THE stool shown in the sketch on this page is of particular value to the home handyman. It is simple to make and dispenses with the use of a step ladder when distemping, painting or papering walls and doing countless other jobs about the house.

Little need be said regarding the construction, as this will be clear from the sketches and cutting list. The height—10ins. in the prototype model—will, of course, depend to some extent on the height of the user, and the walls

normally the subject of decoration, and adjustment should be made in the dimensions given to suit personal requirements.

The top of the stool (and sometimes even the ends and cross-piece) will need to be made up from planks of suitable size joined with 2ins. by ½in. battens. No

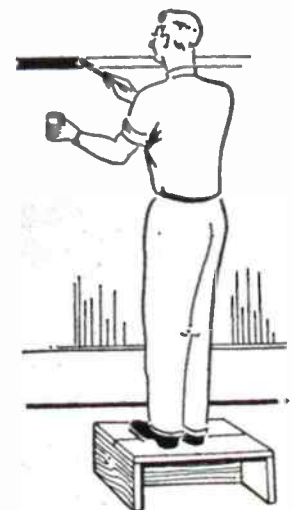
CUTTING LIST	
A.	Top. 1. 27ins. by 15ins.
B.	Ends. 2. 15ins. by 9ins.*
C.	Crosspiece. 1. 25ins. by 9ins.*
All from 1in. material or similar.	
Joining battens as required.	
*See text.	



Details of the platform

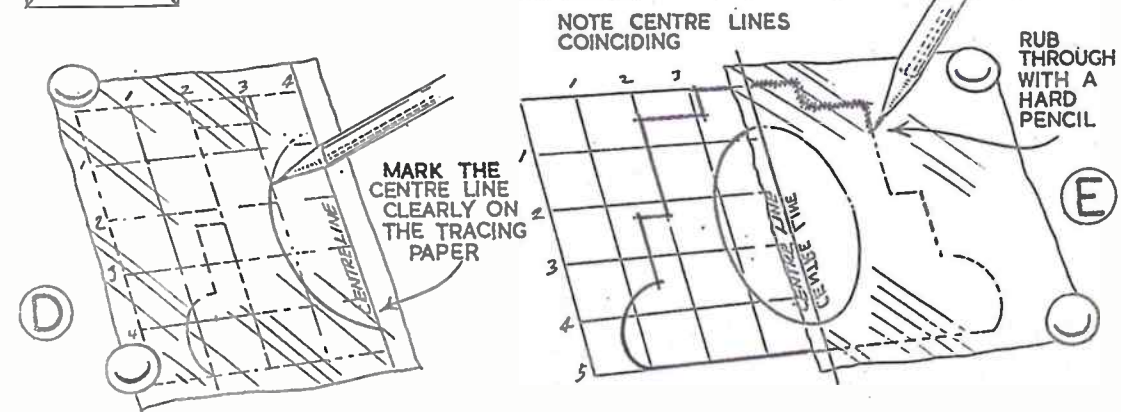
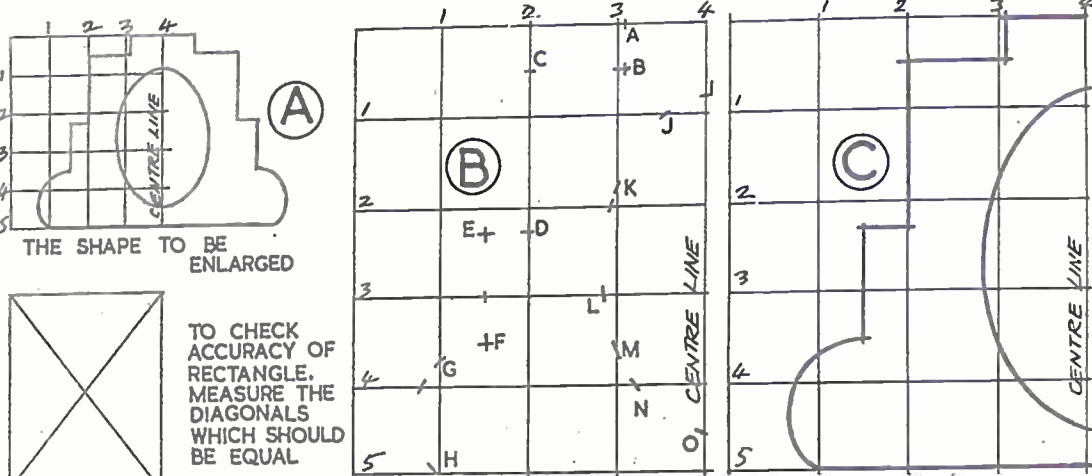
sizes for the planks are given in the sketch as these will vary in accordance with material in the reader's possession. The cross-piece (C) will need to be recessed to accommodate the battens used on the underside of the top of the stool.

If the stool is made of sound lin. timber and joined with good counter-sunk head screws, it should give a lifetime of valuable service. (V.A.G.)



The stool in use

Enlarging by the Square Method



THE size of *Hobbies Weekly* rarely permits designs to be shown full size and we usually give measurements from which the worker can draw out his own plans. Odd shapes which are not easily shown in this way are often 'squared up'. The instructions tell you to enlarge the squares to a given size.

The top left-hand detail (A) shows such a shape squared up as it might appear in *Hobbies Weekly*. In this case the design is symmetrical and only half is squared. If the design had been an odd shape the whole thing would have been squared up.

Let us suppose in this instance that the instructions tell you to enlarge the squares to 1/2 in. With a rule and pencil you draw out the same number of squares as on the design and indicate

numbers or letters on both original and your own set of squares.

If you do not possess a set square you can use a stiff-backed book to make the first corner square. If one corner is square and the measurements accurate the whole thing must come square. An easy check is to see if the diagonals are equal.

The main thing in drawing out is to follow the outline and mark in one square at a time. The main points to watch are where the lines cross the squares. Starting at the top we tick slightly to the right of 3(A), halfway down the square a cross at B. Now to the left the line ends at (C), tick here and proceed down to square 2 across and 2 down (D), then on half-way across square 1 across and 2 down. You can proceed until all intersections have been

marked or you can connect up the lines as you go along. Fig. B shows the intersection ready for drawing in, and (C) shows the completed drawing.

To get the full shape trace the pattern carefully and mark in the centre line as at (D). Turn the paper over and lay it face downwards so that the centre lines coincide as at (E). Rub through with a hard pencil, and the shape will come off on the original drawing.

All you need do now is to line it in and you have a full size drawing of the required shape. For reducing, the same process is used, but your own squares will be smaller.

At a later date we hope to give you details of how to enlarge, or reduce scale drawings, which are required for 'OO' or 'O' gauge railway layouts. (M)

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 L11/16 are accepted as one word. Postal Order and Stamps must accompany the order and advertisements will be inserted in the earliest issue. Announcements of freework goods or those shown in *Hobbies Handbook* are not accepted. The charge for use of a Box No. 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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Carbon Dioxide Used in Experiments

THE colourless gas carbon dioxide is a constant feature of our daily lives. The effervescence we see when we open a bottle of mineral water or mix a glass of health salts is due to the release of carbon dioxide. Yeast and baking powder evolve it and so cause our bread and cake to rise. Our chimneys pour it into the air, for it is formed when wood or coal burns.

Even we ourselves are carbon dioxide producers. Each time we breathe out, the stale air brings carbon dioxide with it. You can prove this by bubbling your breath for a few minutes through lime water (which carbon dioxide causes to become cloudy from formation of calcium carbonate).

If you then add a few drops of dilute

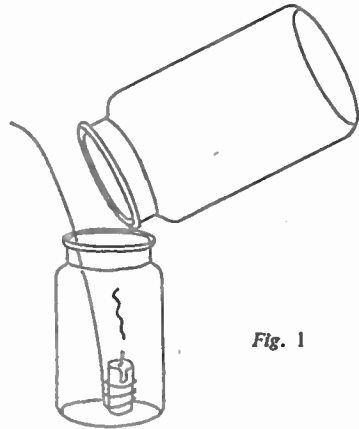


Fig. 1

hydrochloric acid, the calcium carbonate will dissolve and tiny bubbles of carbon dioxide appear. This last reaction is the one used to produce the gas for laboratory experiments. The most convenient form of calcium carbonate to use in your gas generating bottle is marble in small chippings.

As it is heavier than air, collect it by passing the delivery tube to the bottom of a gas jar whose open end is uppermost, that is, by downward displacement.

The gas will not support combustion. So to test when the jar is full, each few moments hold a lighted spill just within the mouth. When it goes out you will know all the air has been displaced by carbon dioxide.

These two properties of being heavier than air and of not supporting combustion are made use of in some fire extinguishers, for the gas lies like a blanket on the burning material and

smothers it.

We can illustrate this by an experiment which will seem magical to any non-scientific friend. Before bringing your friend into your laboratory, fill a two pound jam jar with carbon dioxide. Then twist one end of a length of wire round a candle stub so as to form a holder, light the candle and lower it to the bottom of a one pound jam jar.

Now tell your friend you will extinguish the flame by merely tilting another jam jar over it. Take the two pound jam jar of carbon dioxide and tilt it slowly over the burning candle, just as if you were pouring water (Fig. 1). As the invisible carbon dioxide pours into the lower jar the flame will mysteriously shrink and go out!

Another simple experiment shows how carbon dioxide and air when brought together form two layers just like oil and water. Tilt a jar of carbon dioxide at an angle of 45 degrees, so that some of the gas is spilled out.

A lighted candle lowered slowly into the jar will go on burning for some distance. Then as it sinks into the lower layer of carbon dioxide it will be extinguished.

This forming of a layer below air produces curious effects in some places. There is a cave near Naples on whose floor lies a layer of carbon dioxide 18 ins. deep. A man may safely walk about the cave owing to his height, but a small dog suffocates from want of air. In Java, too, there is the Valley of Death, whose floor is strewn with the corpses of suffocated animals and birds.

In these places the carbon dioxide seeps from rock crevices or the earth. Were there not this constant replenishment of the gas, neither of these places would be dangerous, for carbon dioxide slowly diffuses into the air.

To prove this, leave a jar of carbon dioxide on your bench overnight. Then lower a lighted candle into it. The candle will now continue to burn.

This diffusion is essential to plant and animal life, for it disperses the gas evenly over the earth's surface. Plants use carbon dioxide to obtain the carbon they need for their growth. Breathing in the gas through their pores, they split it into its components—carbon and oxygen. They return the oxygen to the air for animal use. Without plants to do this for us we humans would slowly suffocate in the carbon dioxide we breathe out.

An interesting experiment is to watch a plant doing this, and the best result is

obtained by first dissolving the gas in water. Almost fill a wide deep jar or basin with water and bubble carbon dioxide through it for half an hour.

Tie a bunch of fresh pondweed or watercress to a stone, sink it in the jar and shake the plant to dislodge any air bubbles trapped beneath the leaves.

Attach a funnel to a test tube by passing the stem through a bored cork. Separate tube and funnel and sink them in the jar so that both fill with water. Invert the test tube, taking care that no air enters it, attach it to the funnel and clamp the whole as shown in the sectional diagram (Fig. 2).

Leave the whole apparatus in sunlight or bright daylight for at least eight hours. You will then find that oxygen has collected at the top of the test tube and pushed down some of the water.

Keeping the mouth of the test tube still immersed and mouth down, remove the cork and funnel. Then close the mouth of the test tube with your thumb, take it out of the jar and invert it, so that the gas comes up to the mouth. Remove your thumb and

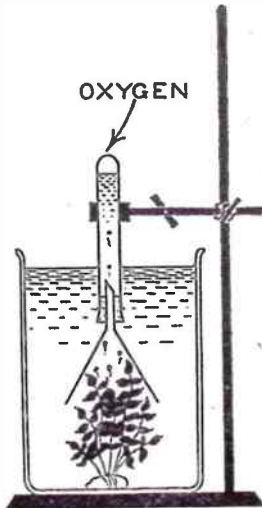
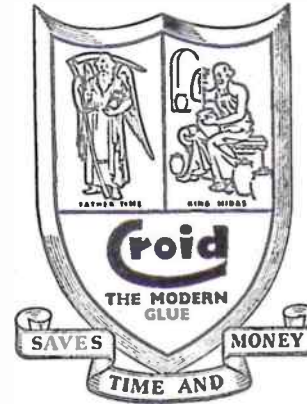


Fig. 2

quickly pass in a glowing wood spill. It will at once burst into flame, thus showing the gas is oxygen.

The 'dry ice' used in ice cream containers consists of solidified carbon dioxide. It has the advantage over ice of not becoming wet when it warms up; instead, it passes into gaseous carbon dioxide. (L.A.F.)



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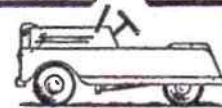
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About Oriental Woodwork Tools

THE Chinese are supposed to have invented the mariner's compass, the art of printing and many other things and it is possible that their carpenters were using workable tools when Western workmen were hacking away with crude bits of iron and bronze. It seems, however, that, beyond a certain stage, the Chinese fail to develop their inventions, and though, we presume, many Western carpenters tools are to be found imported in China today, age-old tools are still used by carpenters, who, incidentally, make their own equipment.

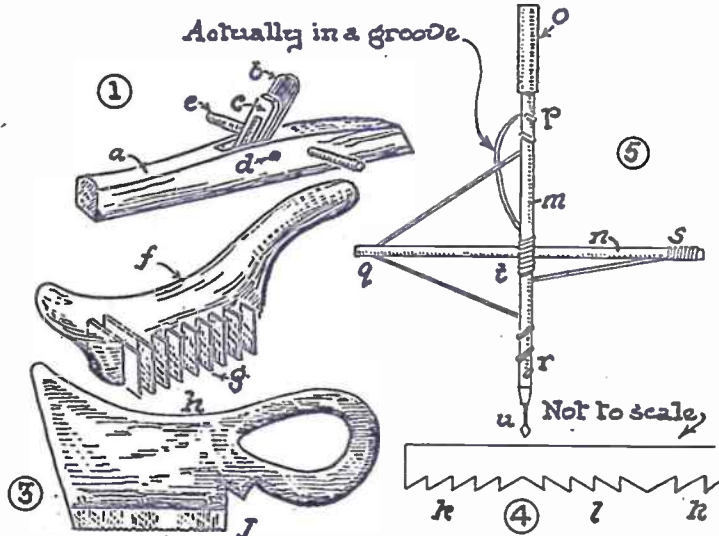
Odd Plane

In Fig. 1 we see a plane (made in two sizes to correspond with the English jack plane and try plane). The stock *a* has an opening through which runs a rod *d*. Behind this rod goes the iron *b* and the wedge *c*. There is no cap iron. As the wedge is knocked in, between the rod *d* and the iron *b*, the iron is pressed against the back of the opening. Some very cheap block planes in England work much on the same principle. The plane is held by the handle *e* with both hands.

A Scraper

This plane does not leave a very satisfactory finish, so the peculiar tool shown in Fig. 2 is used. It consists of a number of pieces of steel, about 2ins. wide and $\frac{1}{4}$ in. thick set into a block of wood as shown. There are about twenty or so blades to every scraper (the drawing has been simplified) and each has a wire edge struck on, exactly as in an English cabinet scraper. If the blades have been newly set and the tool used by a skilled man, a very smooth finish is left on the wood and no glasspapering is ever needed, even if the wood has to be highly polished.

In Fig. 3 we see a bench saw. The blade is pegged in at the bottom. The teeth are often arranged to cut on the forward stroke, as in England. The Japanese carpenter on the other hand



likes to have the teeth set backwards so as to cut as the saw is drawn towards the body. Some Chinese have the saw teeth cut in both directions, shown diagrammatically in Fig. 4. The idea is that one set cut on the forward stroke and the other half act on the otherwise idle backward move. In practice this does not work out well. In any case, the teeth are often not 'set'. The saw illustrated is held by the handle with the right hand and with the horn in the left hand. The type of saw retained, to this day, in England, as the bow saw, is extensively used in the Orient.

Involved Drill

In Fig. 5 we see a Chinese drill consisting basically of two separate hardwood sticks *m* and *n*. Stick *m* has a loose collar *o*, which is held by one hand. Stick *n* is held by the other hand at point *s*. A thong is attached to point *r*, given a few turns around *m* and

then carried through a hole *q* in *n*, then around *m* again to a hole at *p*. It now continues through a groove cut in *m* down to the level of *n* where it is given half a dozen turns around *m* and is then carried to *s*. This may sound complicated in print, but if the reader cares to make a simple working model he will find that as the stick *n* is used like a violin bow, the vertical stick rotates, first one way and then the other. The tool would work just as well if the cord were tied to point *p* and then another started from *t*. Presumably, however, the arrangement described avoids the necessity of cutting a cord. The bits used at *u* are somewhat like the bits of a fretwork drill though larger, but with a maximum diameter of about $\frac{1}{4}$ in. They are just wedged in a very simple chuck.

A study of such tools enables us better to appreciate the 'why' of the tools we ourselves use. (329)

table or shelf. A wooden shelf about 18ins. wide and 36ins. long could be secured direct to the wall by means of metal brackets.

There will be no need for a lid stay since it will rest against the wall. It might be convenient to screw a small knob in the lid for lifting, but this is optional. The labels are made from cardboard, with a tab bent back at each end, and secured by means of drawing pins. (M.p.)

Vegetable Storage Cabinet

(Continued from page 146)

pinned in place.

Painting

Give the whole cabinet two applications of flat undercoat. Finish off with one coat of glossy paint. We suggest the most suitable colour to be cream. Although liable to get dirty more

quickly, it will show off the fruit and vegetables to great advantage.

Line the bottoms of the compartments with oilcloth or linoleum cut to shape. This can be taken out periodically and scrubbed clean.

The cabinet should be mounted on a

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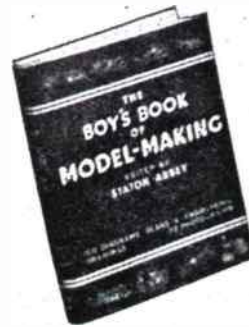
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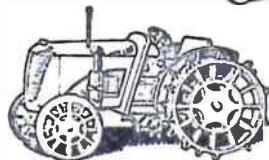
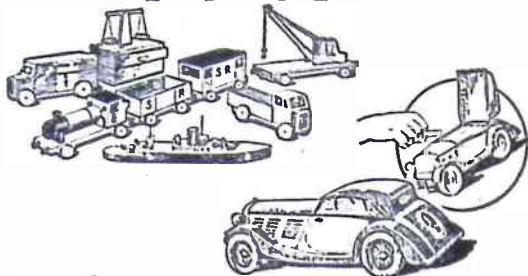
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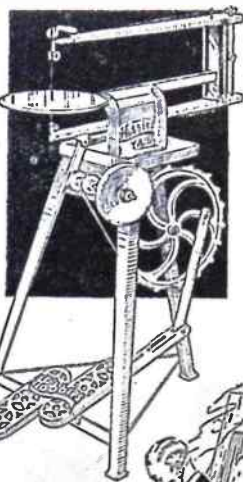
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