

Hobbies

WEEKLY

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April 4th, 1951

Price Fourpence

Vol. III No. 2892

THIS real working model of the common domestic mangle would please a young child, both for pressing doll's clothes, and helping Mother on washing day. It is quite easy to make, but does need reasonable care in construction to ensure the rollers working easily. Little wood is necessary, as the material could well be cut from an odd length of timber, and planed to size.

Fig. 1 shows a rear view of the mangle, and a side view. A few outside dimensions are given, but all parts lettered have their exact sizes given in the cutting list, and so repetition is unnecessary. Make a start with the feet. In the centre of each, chisel out a mortise $\frac{1}{2}$ in. long and $\frac{3}{8}$ in. wide. To fit these cut

A CHILD'S WORKING MODEL MANGLE

two pieces of wood $\frac{3}{4}$ in. wide and $\frac{1}{2}$ in. thick to the length given at (I) in Fig. 2, plus the depth of the mortise. Glue these parts in the feet, then bevel the ends down, as shown in the diagram.

Prepare the side posts (A) and nail these to the pieces of wood, glued to the

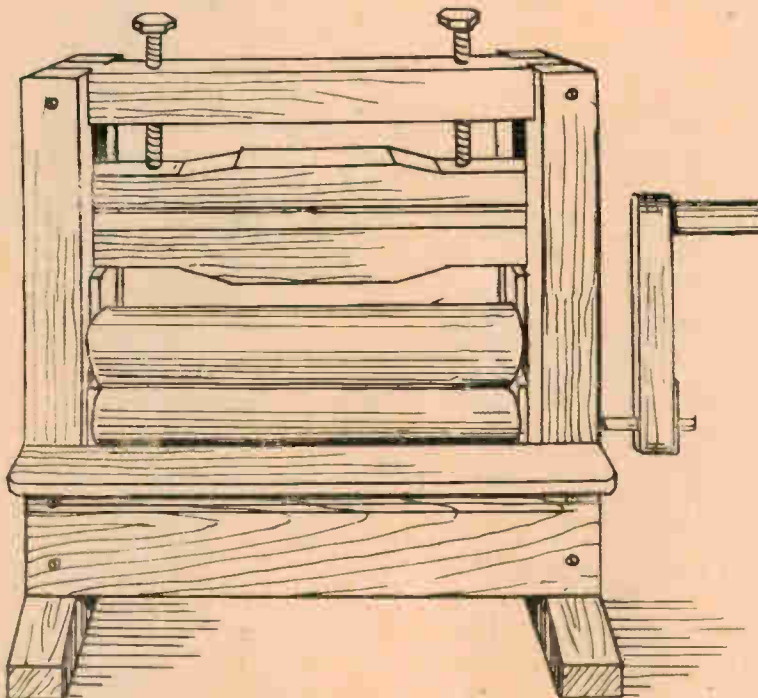
feet. Cut top crossbar (F) and reduce $\frac{3}{4}$ in. of each end to $\frac{1}{2}$ in., as at (J). Fit this across, between the posts, and secure the lot with a round-headed screw. In the space between each set of posts, the sliding bearing blocks, which carry the rollers, will fit.

Reference will be made to these later on. Cut the rear bar (B) and front bar (C) and reduce $\frac{3}{4}$ in. of each end to a thickness of $\frac{1}{2}$ in., as shown at (M) in Fig. 3. The unreduced portion must be of the length shown to fit between the posts. Bar (B) has its top edge bevelled off a little. Both are then screwed across at front and back. To bar (C) the board (D) is nailed or screwed, the outer corners of this being rounded off.

Making the Rollers

For the rollers, a piece of 1 in. diameter round wooden rod will be needed, sawn into two 6 in. lengths. Spindles for these must be fixed at each end of the rollers, and obviously, if they are to rotate evenly, the centring must be accurately done. The better to ensure this, a jig should be made up, a sketch of which, or part of it, is given at (P) in Fig. 3. It is a simple affair made as follows.

Cut a 1 in. square of wood $\frac{3}{4}$ in. thick, and centre it most accurately at back and front. Prick the centre with an awl, and there drill a hole through to suit the spindles. Drill this from both sides, as the hole must run straight, or the spindles will not be true. Nail 1 in. wide strips of wood to this, each side, and at about 6 in. from the wood square, nail a second piece across, also 1 in. square to



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act as a stop. A piece of waste wood nailed underneath the whole will complete.

In use the rollers are placed one at a time, of course, in the jig and there held firmly, while the drill bit is inserted in the hole, and drills the hole required in the roller. Wire nails will do for the spindles. These are firmly driven in the holes and cut off, leaving pins $\frac{3}{4}$ in. long

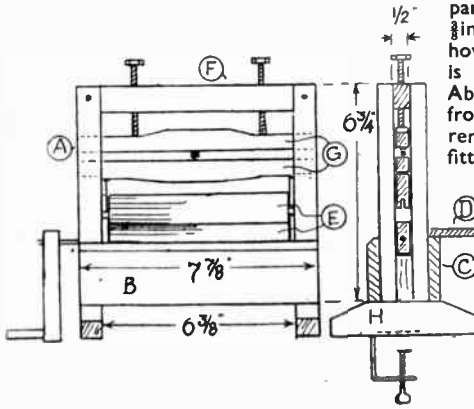


Fig. 1

to three of the four ends.

The fourth end needs a longer spindle, as it carries the handle of the mangle, so should be about 2 ins. long. To fix this latter spindle more effectually, a little filing to the point should be done for it to penetrate the wood a trifle deeper.

The bearing blocks for the rollers are shown at (N) and (O), the former carrying the lower rollers, and the latter the upper ones. These can be cut from the solid wood or formed by gluing $\frac{1}{2}$ in. square strips to $\frac{3}{4}$ in. wide pieces of $\frac{1}{2}$ in. wood, as preferred. A good plan is to prepare a strip long enough for the blocks, and cut it up into four pieces, of the lengths given, two of each size being required. Centre and drill blocks (N)

and in blocks (O) drill suitable spindle holes at centres $\frac{1}{2}$ in. up from the bottom ends, then cut the holes to form slots, as seen in the drawing.

Pressure Bars

Prepare the two pressure bars (G) and cut to shape, reducing the ends to $\frac{1}{2}$ in. thickness. The lower bar has $\frac{3}{4}$ in. of each end reduced another $\frac{1}{4}$ in., leaving the parts which rest upon the bearing blocks $\frac{3}{4}$ in. as in detail (K). This sketch shows how, in the centre of both bars, a recess is cut into which the spring rests. About 1 in. of helical spring will do here, from $\frac{1}{4}$ in. to $\frac{3}{8}$ in. diameter. Now remove the top bar of the mangle for fitting in the rollers, etc.

Slide on each spindle a brass washer, fit the correct blocks each end and push between the side posts. See here that the washers are thick enough to prevent any end play of the rollers, adding an extra one if necessary. Over these fit the two pressure bars, the lower one resting on the top ends of the upper bearing blocks.

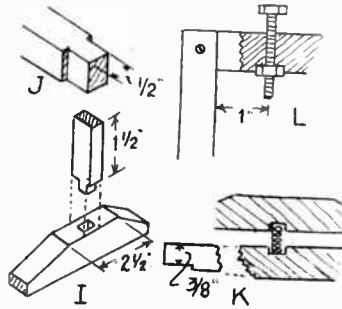


Fig. 2

Before replacing the top crossbar, bore a hole $1\frac{1}{2}$ ins. from each end, for the adjusting screws to enter. These are a pair of $\frac{1}{2}$ in. by 2 in. or 3 in. steel bolts, with hexagon heads and nuts. In the underside, chisel out recesses for the nuts to enter about halfway, as at (L) Fig. 2. Now replace the bar, and turn the bolts until they press, not too heavily, on the rollers. A good idea is to bore a shallow recess in the top bar, at each of the places the bolts bear upon, to prevent any side shifting of the bar.

The handle (Q) in Fig. 3, is a length of $\frac{3}{4}$ in. by $\frac{1}{2}$ in. wood, cut to the measurement given. In one end, that which goes over the roller spindle, cut a square hole. The end of the spindle should be filed roughly square to tightly fit this.

As some strain comes on the handle at this place, the hole should be strengthened by nailing over it a small piece of sheet metal, with a square hole to correspond with that in the wood. See the fit is a tight one, then the handle will not develop an annoying tendency to fall off. At the opposite end, glue and screw a piece of dowel rod for a hard grip.

Securing the Mangle

If a pair of cramps are considered desirable, to enable the mangle to be fixed more securely to the table, buy two of those cheap iron ones, usually to be got at most hardware stores. These can be fitted to the feet, as in the side view Fig. 1, the top arm of each clamp being sunk in the wood, and then fastened with a single screw.

Fix so the screw of the clamp comes just under the centre of the feet. The screw holes should, if possible, be well countersunk, but as this is an awkward job to do in such circumstances, see that the recesses in the feet are deep enough to sink not only the top arm of the clamp, but also the projecting screw-head, or the latter will mark the table when the mangle is cramped to it.

(394)

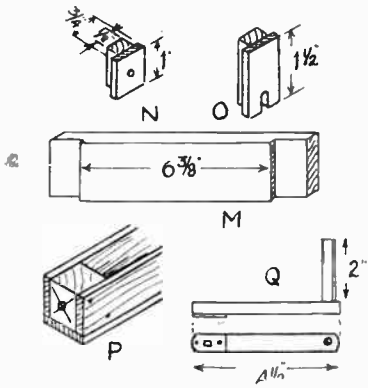


Fig. 3

CUTTING LIST

Posts (A) (4) — $6\frac{1}{2}$ ins. by $\frac{3}{4}$ in. by $\frac{1}{2}$ in.
Rear bar (B) — $7\frac{1}{8}$ ins. by 2 ins. by $\frac{1}{2}$ in.
Front bar (C) — $7\frac{1}{8}$ ins. by 2 ins. by $\frac{1}{2}$ in.
Board (D) — $7\frac{1}{8}$ ins. by $1\frac{1}{8}$ ins. by $\frac{1}{2}$ in.
Top bar (F) — $7\frac{1}{8}$ ins. by $\frac{3}{4}$ in. by $\frac{1}{2}$ in.
Pressure bars (G) (2) — $7\frac{1}{8}$ ins. by $\frac{3}{4}$ in. by $\frac{1}{2}$ in.
Feet (H) (2) — $4\frac{1}{2}$ ins. by 1 in. by $\frac{3}{4}$ in.
For rollers, 2 6 in. lengths of 1 in. diameter wooden rod. 1 pair of $\frac{1}{2}$ in. diameter wood, with hexagon heads and nuts. 1 pair of small size iron cramps (optional).

Lineside Camouflage—(Continued from page 419)

'Stone paper' can also be purchased in sheets. This gives the appearance of rough stone finish and is at times more appropriate than brick. The brick paper, however, is more colourful.

In all cases, these papers must be well secured to the underlying strip and to this end good quantities of fairly thin glue must be used. It is no good trying to work with small quantities of adhesive. Both paper and support are well coated, and, after being brought into contact, are 'rubbed together' with a soft pad. Strength is helped by taking the paper

over the edges of the strip in question and well down on the further side, which, being away from the observers, need not be completely covered.

FRUIT HOLDER DESIGN

Material for making the Fruit Holder (No. 2892) from this week's design, is available, price 6/11, including tax, from Hobbies Branches, or 7/9 post free from Hobbies Ltd., Dereham, Norfolk.

Model advertisements (bought in sets) often help to give a more realistic and railway-like finish to a wall. But do not overdo them. Too many all over the place may spoil an otherwise good effect.

For a really nice finish, the ugly space between rail-level and the floor must be camouflaged and here we cannot beat draping with some old dark-coloured curtains, which somehow give the vague impression of a continuous embankment. They also make the track look solid and take away that appearance of being suspended in mid-air.

(398)

Railway modellers will appreciate these hints on LINESIDE CAMOUFLAGE

SCENIC effects are really very important to a model railway. Indeed a line without a 'surround' is like a picture without a frame. The frame certainly is never the picture, but a nice frame can make a good picture look infinitely better, and often turns a poor one into something passable.

Therefore, if you have not done so before, concentrate to a certain extent upon the scenic effects of your layouts, and there is little doubt that you will be surprised at the difference it makes in every way.

Effects around a line can be used in two ways, for they can be made (1) to *add* to the apparent size and importance of the system or (2) to *take away* surrounding items that are not wanted and spoil the 'look of things'.

No Need For Expense

Curiously, although generally covering fairly large areas of vacant space, scenic effects need not be expensive. In fact they can be added very cheaply, as much use can be made of materials such as wrapping paper, pieces of sandstone, plain wall-papers, old curtains and the like. Items not close up to the tracks

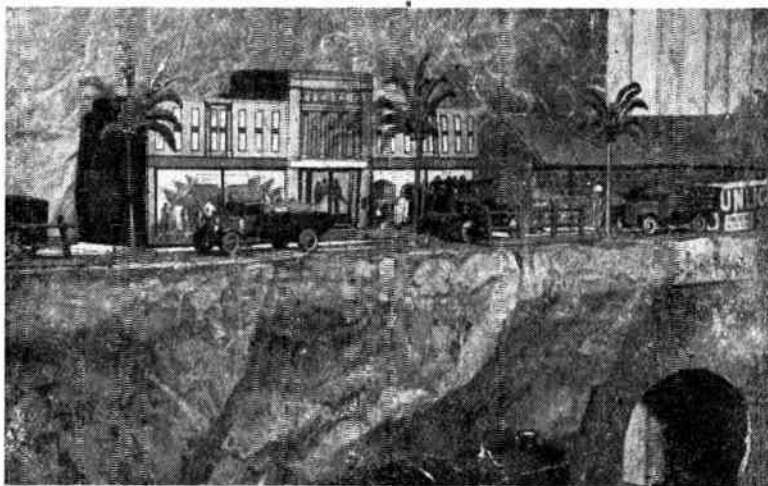


Fig. 1—An arrangement that hides an unsightly mantelpiece. The buildings are inexpensive 'sheet' toys

young people to cut it easily with scissors, but it can be strengthened for model railway work by pasting rectangles of stiffer card on the inside. A whole range of buildings can be obtained in these cheap 'cut-outs' including shops, houses, farms and petrol stations. From recent observation the list seems to be growing.

Fig. 1 is interesting for two reasons, for apart from giving the model layout a town, the arrangement *hides* an unsightly mantelpiece. All lines that are permanently laid in rooms have at

they are extremely easy to make in quantity. Their use in hiding things is found in such places as where a background meets the baseboard and leaves an ugly line and where other items do not join too well.

Model walls are made by covering strips of card or wood with 'brick paper' which is obtainable at any model dealers at a few pence per sheet. With the necessary materials to hand, large amounts of wall can be rapidly built of any desired shape and size to suit the special requirements. Indeed on this question of good 'fitting', home-made wall is far better than any bought lengths, which seldom seem to fit exactly.

Fitting Buttresses

Good standing can be secured with cardboard walls by bending the material out to a buttress every so often and wherever possible taking it round at right angles (see Figs. 2 and 3). If shapes like this are not wanted, then triangular pieces must be placed at the back to give the necessary support.

(Continued foot of page 418)

BUTTRESS SHAPES AS (A) AND RIGHT-ANGLE BENDS (B) MAKE CARD WALLS STAND

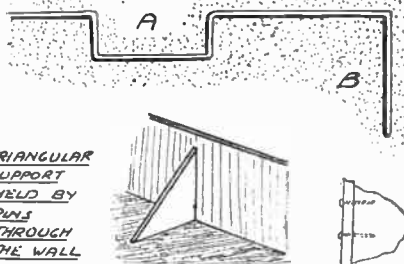


Fig. 3—Wall construction

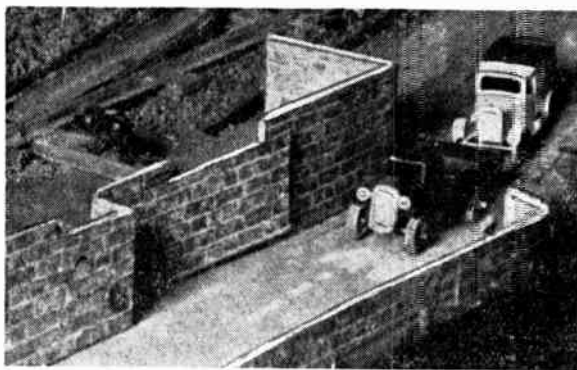


Fig. 2—Cardboard walls

are really better if broad in conception and with no great detail. In some cases, such as hills, the rougher the finish, the more realistic they look.

Model towns set here and there are effective and can be built up from those sheets of 'cut-out' toys which can be bought for a few pence, and which, in their own way, are really rather good productions.

Take a look at Fig. 1. Here we get a quite presentable model street. Yet the buildings you see there cost under sixpence. The large store was bought at what at one time would have been called the 'penny stall' at the local market, while the left-hand erection cost only the value of its brick paper covering—perhaps one half-penny. The cardette upon which the cheap lithographed toys are printed is somewhat thin, to allow

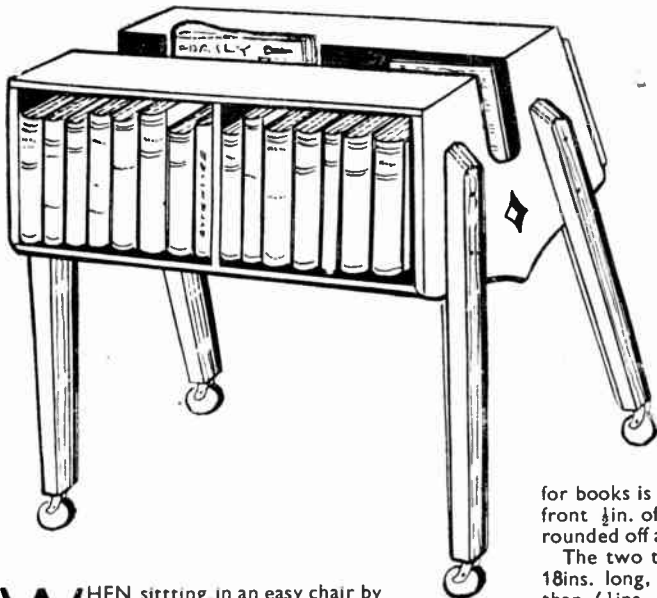
some point to cross before the fireplace but the mantelpiece is normally too high for the tracks which have to be run past at some lower level.

Model lines, mantelpieces and fireplaces do not agree too well, so, perhaps, there is no better place in a room to attempt a little camouflage. On the line in question, a sheet of thick and slightly crumpled wrapping paper was hung from the edge of the shelf to track level, and a strip of plain blue paper pasted along the wall at the back. The town was then assembled as indicated. The 'Dinky' motors certainly help the effect, but are not absolutely essential.

Walls

Walls are of great assistance in giving an appearance of completion and are first-rate 'camouflagers'. Moreover,

For the man who reads, this is the ideal FIRESIDE COMPANION



WHEN sitting in an easy chair by the fireside reading the newspaper or studying a book, it is nice to have books of reference such as dictionaries, encyclopaedias and maps in a handy place. It is most annoying to have to jump up every little while when a book is needed from the bookshelf or from another room, and it can also waste a considerable amount of time.

All this can be avoided by having reference books in a fireside reading companion as illustrated and described in this article. The shelves for books on either side are at a convenient height when sitting in an easy chair and the castors on the legs make it quite easy to turn round to get a book from the other side. In the centre is a space for newspapers and magazines, while the top is left flat to hold the books being referred to, or for a small reading lamp.

Any Kind of Wood

It does not matter what kind of wood is used, but as the ends are made of plywood it would probably be best to make the shelves and legs from a light coloured hardwood. The whole framework can then be stained and polished, or else painted with a cellulose lacquer.

Cut the two end pieces first of $\frac{3}{4}$ in. plywood having a length of $11\frac{1}{2}$ ins. and a width of $14\frac{1}{2}$ ins. No great difficulty should be experienced in cutting them to the shape shown in Fig. 1. A coarse cut fretsaw will do nicely if the job is not hurried through. And it is not necessary to stick rigidly to the design given if you have a better idea in mind.

Next, mark out on the insides of the two ends the exact positions for the bottom shelves, the two top pieces and

the four ply panels forming the interior section. You will then be able to cut these various pieces and fix them into their exact positions quite easily.

Make the bottom shelves for the books first. These are two pieces of $\frac{3}{4}$ in. thick wood, $16\frac{1}{2}$ ins. long and $5\frac{1}{2}$ ins. wide. The width allowed

for books is $4\frac{1}{2}$ ins., and the front $\frac{1}{2}$ in. of the boards is rounded off as shown.

The two top boards are 18 ins. long, a shade wider than $4\frac{1}{2}$ ins. and $\frac{1}{2}$ in. thick. A slight bevel on the back of each to fit the ply panels accounts for the extra width. These top boards are fastened to the top of the end pieces and not in between like the book shelves.

These four boards can now be glued and firmly pinned in position. While it is only necessary to use panel pins on the top it is best to screw the book shelves in as they will carry a fairly heavy load. There is room to fix corner blocks underneath and on the inside if desired.

The Book Shelf Backs

When the glue has set firmly, the ply backs to the book shelves can be cut and fixed. These will be $16\frac{1}{2}$ ins. long, about $9\frac{3}{4}$ ins. wide (check up on this from the marked side before cutting) and $\frac{3}{8}$ in. thick. Glue and fasten these with small panel pins—there is not much room to

knock the pins in but if holes are drilled in the plywood first it will be quite easy.

It will be found that there is nothing to which to fasten the ends of the plywood panels, but if wedge shaped spacing bars are cut as shown in Fig. 1 they can be secured to them. If cut about $8\frac{1}{2}$ ins. long, $\frac{1}{2}$ in. thick, and 1 in. wide at one end, tapering off to nothing, they should fit all right, but check up on these sizes first. Glue and pin firmly to the end pieces of the framework. A few pins in the ends of the ply panels will hold them secure.

Centre Section

Now cut the ply panels which form the centre section of the stand, and the space between them as shown in Fig. 1 is 2 ins. Cut two pieces of $\frac{3}{8}$ in. ply $16\frac{1}{2}$ ins. long and about $9\frac{3}{4}$ ins. wide. Bevel off the top edges of these to practically a knife edge so as to fit flush with the top of the case, and glue and pin in as before.

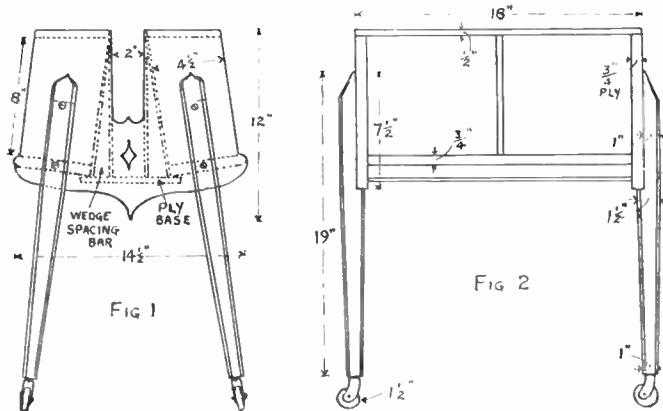
A light partition is shown in the centre of the book shelf in Fig. 2. This helps to keep the books in order and also acts as an extra support for the ply back, but it can be omitted if desired.

This completes all the casework and it only remains to fit four strong legs to finish off the job. By choosing nice straight-grained wood free from defects, the cutting and shaping will be made much easier.

The length of the legs can be varied to suit your own requirements—you may like the case to be nearer to the floor or just the opposite. The size shown, however, gives a well balanced appearance which should do for most purposes. Cut four pieces 19 ins. long and $1\frac{1}{2}$ ins. square, and from one side of each, cut out a piece $\frac{1}{2}$ in. deep to a distance of 7 $\frac{1}{2}$ ins. This allows the leg to fit closer to the end piece and also forms a support for the case.

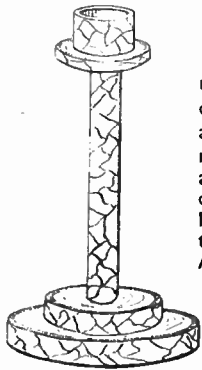
Besides shaping the tops of the legs as

(Continued foot of page 421)



Constructional details

Attractive novelties are these RUSTIC CANDLESTICKS



RUSTIC hand-work always attracts admiration. Quite ordinary everyday articles take on a new and striking aspect when slices of logs and branches have been used in their construction. As presents, they delight, and as raisers of pocket money they find a quick sale.

Instances of what can be done in this type of wood-work are the two candlesticks illustrated. As will be readily apparent, they are merely the two common types of candlestick 'rusticised'. The only materials needed are some short pieces of thick and thin logs, well seasoned and having their bark firmly attached. With so much log fuel now supplementing the coal fires in many homes, most or all of the wood needed can be found in the house. A little thick copper wire, if available, will give a handsome effect when banded round the candleholder of the tray type shown.

The log widths indicated may be varied slightly—but not too much—if the exact dimensions cannot be met.

Trial Slices

If you have not done this sort of work before, it is good practice to cut a few trial slices, so as to gain the ability to cut a clean slice of even thickness. The ability soon comes. A sharp saw is essential, as is a firm upright against which to press the log while sawing—for the thinner logs, a bench hook, and a log-sawing horse for the thicker ones. Once the cut is started, saw right through without turning the log, for turning results in unevenness which is hard to remove.

The standard candlestick calls for logs of diameter 4ins., 2½ins., 2ins., 1½ins. and ½in. First prepare the base. For this, cut ½in. slices from 4ins. and 2½ins. logs, taking care not to damage the bark as you finish the saw cuts. Glasspaper the 4ins. base piece on both sides, and the 2½ins. piece on one side only. The glasspapering should be continued until the smoothed side shows a surface of satiny, unbroken lustre when held so

that light is reflected from it. The slightest roughness will show up in an unsightly manner when the article is varnished.

Next cut a 5ins. length of the ½in. diameter wood for the pillar. The ends of this need only be glasspapered sufficiently to remove any slight saw burr.

The Flange

For the flange beneath the candle socket, choose a part of the 2ins. log where the bark is very firmly attached to the wood. Saw a ½in. thick slice for this and glasspaper both sides.

Before cutting the candle socket piece from the 1½ins. wood, glasspaper the end, and then drill with brace and bit a hole ½in. wide and ½in. deep. Make the saw cut ¾in. from the drilled end, and smooth off any saw burr carefully.

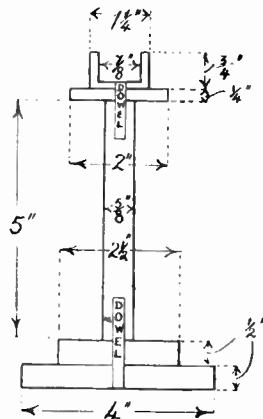


Fig. 1

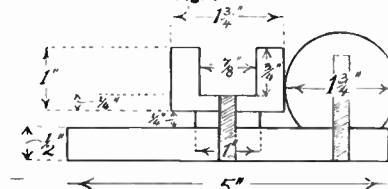
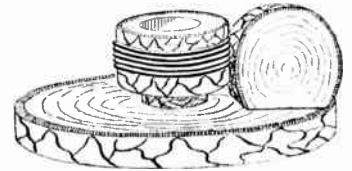


Fig. 2

The parts are fitted together with short lengths of ½in. dowel, and a touch of glue between the contacting surfaces making the whole job rigid. Care must, of course, be taken when drilling the dowel hole in the pillar, to make a dead vertical hole. To avoid damaging the thin base of the candle socket it will be found better to glue socket to flange before drilling.



This type of candlestick is best made in pairs so as to balance their effect on sideboard or mantelpiece. A good finish is ordinary shellac and methylated spirit varnish thinly applied and giving several coats until a smooth lustre has been attained.

Tray Type

For the tray type candlestick select logs of diameter 5ins., 1in., and 1½ins. Cut and glasspaper on both sides a ½in. slice from the 5ins. log, then a ½in. disc from the 1in. log. This latter need not, of course, be polished, for neither of its sides shows in the finished article.

The candle socket is smoothed and drilled before sawing it off the log, in the same way as for the standard candlestick. If, however, you intend to bind it with copper wire, then this must be done first—before drilling, for the loose ends have to be lightly hammered in and this operation might split the socket if it were already drilled.

Wrap four or five turns of wire round the socket, allowing a ½in. overlap at each end before snipping off the surplus. Remove it, and sharpen a ½in. of each end with file or grindstone, and bend up at right angles. Hammer in one sharp end, bind the rest round evenly, tapping lightly as you go to bed it in. The other sharp end is hammered in in the same vertical line as the first, so that these will be finally hidden behind the finger disc. Now drill and saw off the candle socket.

The finger disc is a ½in. slice from 1½ins. wood, and has a portion sawn off, as indicated in Fig. 2, so that it will fit flush. The dowel hole for this is best drilled before sawing the slice off the log. Glasspaper this on both sides.

Carefully drill the other dowel holes (the dowel positions are indicated in Fig. 2 by the shaded rectangles), and glue all dowels in, also giving a touch of glue between the contacting surfaces.

This candlestick, too, is given a warm and cheerful tone by using shellac-meths varnish. The copper banding, however, is best left uncovered so as to preserve the colour. (115)

Fireside Companion—(Continued from page 420)

shown in Fig. 1, also bevel them off as in Fig. 2. The bottom part of the legs, from the 7½in. mark, are tapered to 1in. at the end. They can be left square, but will certainly look better and more in keeping with the design if the edges are chamfered as shown in the sketches.

Carefully drill the ends of the legs to fit the castors, a useful size for these being with 1½in. wheels. If rubber tyred ones are used then they will probably be a little larger. Fix the legs on to the sides of the case with wood screws.

Well glasspaper the entire woodwork, stain to the desired colour, and then polish. If a cellulose lacquer is used it is best to give a coat of priming first, allowing it to dry well before applying the lacquer. (112)

A modern method for the old game of NOUGHTS AND CROSSES

THE old game of noughts and crosses still seems to be very popular and causes endless amusement to people of all ages. There is, however, one rather serious drawback and that is the large amount of paper that can be used up when one is a really keen player.

All this is avoided by making the simple little board described in this article. Different coloured marbles are used instead of marking the paper with noughts and crosses.

Before describing the making and working of the board, let us have a word or two on how the original game is played, for the benefit of those who do not know.

The Squares

Nine squares are made in three rows of three by putting two parallel lines on the paper and crossing them with two more parallel lines. One player puts a cross in one of the squares, then the other player puts a nought in another square and so on alternatively—the object being to get a row of either noughts or crosses.

The first to complete a row is the winner. Besides trying to get a row you must also try to stop your opponent from completing his row. You can win by getting a row of any three across or up and down, or even a diagonal row.

A very interesting modern variation of the game is played by having rows of four instead of the more usual three. This makes the game rather more

complicated, and it is not at all easy to get a completed row of four. It is, therefore, necessary to score by means of points—one being allowed for three in a row and two points for a complete row of four.

When playing on the 'four' board the game must be continued until all holes are full and then the scores added up. This is different from the 'three' game which stops directly one of the players has completed a row.

When playing on the board, clear marbles can be used for, say, noughts, while the crosses can be represented by a coloured marble.

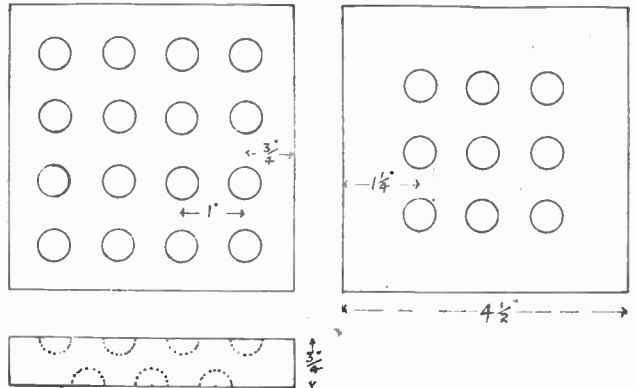
The board is designed for both the three and four row games—one being on each side. Choose a piece of nice close grained hardwood for the job—about $4\frac{1}{2}$ ins. square and $\frac{3}{4}$ in. thick. If carefully marked out according to the measurements given in the drawings none of the holes on one side will be opposite any of the holes on the other side.

To make the holes, first drill a small guide hole, and then with a counter-sinking bit, drill down until the top of the

hole has a diameter of $\frac{1}{2}$ in. Now cut the hole semi-circular with a gouge and glasspaper smooth.

A very useful tip for doing this job is to take a piece of $\frac{1}{2}$ in. dowel rod, round off one end, and by placing a piece of glasspaper over it, twirl it round in the hole. If the dowel is cut to fit a drill-stock, a really expert finish can be obtained in much less time.

A somewhat easier way of making the board is to use 1 in. lengths of $\frac{1}{2}$ in.



dowel rod instead of the marbles. Drill $\frac{1}{2}$ in. holes in the board to a depth of about $\frac{1}{2}$ in. and glasspaper the dowels until they are an easy fit in the holes. One half of the dowels can be painted with red tops while the other half can have black tops.

Finish the board off by either french polishing or with a good wax polish. (356)

Replies of Interest

Reducing Motor Speed

I HAVE a Hobbies Bench Lathe with the two pulleys as supplied, $1\frac{1}{4}$ ins. and $1\frac{3}{4}$ ins. My supply of power is a 110 volt D.C. electric motor 1/2rd H.P., rating 1,440 r.p.m. and fitted with a 4 in. pulley which turns the lathe at too great a speed. I wish to obtain a speed of approximately 700-800 r.p.m. How can I reduce the speed of the motor to obtain this? (W.E.S.—Kidderminster).

WE would say that to produce a speed of about 700 r.p.m., a $2\frac{1}{2}$ in. diameter wheel should be put at the end of the motor spindle, and a 5 in. wheel on the outer end of the lathe spindle.

Making Blue-print Paper

I TRIED making blue-print paper, mixing the two solutions as instructed, but it was just a blank bluish-green. Can you give any reason for its failing? (F.A.—Bristol).

IT may be that the solutions were made with impure chemicals; the water was contaminated, or the paper might not have been suitable. Possibly the paper has 'fogged' by exposure to light, or the

exposure given may have been incorrect. This is probable, and a test at different exposures should be made. The final washing may have been inadequate or insufficient in volume and purity. We suggest you check on these points and try again.

Bleaching Oak

I AM building a small residence pipe organ, and have just completed the console which is fitted with a roll top cover, and in selecting well seasoned oak, I have had to use wood of varying colouring. I wish to finish the console in a natural shade by oiling and waxing, but there are one or two pieces which are considerably darker in shade than the tone in which I wish to finish. Can you advise me as to the best method of bleaching these darker pieces so as to bring them up to the lighter shade desired? (S.G.—Oulton Broad).

OAK can best be bleached with an application of oxalic acid. This should be diluted, about 1 pint of water to 1oz. of the acid. It is best to leave for a day or two to see that the bleach has

taken permanent effect, and to give a second application if thought necessary. All being satisfactory, wipe over the surface with common brown vinegar, and let dry before finishing.

Casting Lead Soldiers

I AM interested in casting lead soldiers, I and wish to make them hollow. Can you advise me as to the correct percentage of other material to be added to the lead, and the temperature of the mixture? (A.M.—Plaistow).

HOLLOW lead soldiers, or other cast objects, can be made by simply pouring the molten metal into the mould, then pouring out the surplus. The metal chills on the parts in contact with the mould, much faster than the central mass—hence the 'pouring out'. We fear the present restrictions on metal usage will hamper or prevent a continuance of your hobby, but if obtainable legally, a mixture of 65 per cent lead, 25 per cent antimony and 8 per cent tin and 2 per cent bismuth, would make a good casting alloy.

Every home handyman should have a PORTABLE TOOL BOX AND BENCH

THE subject of this article forms a useful tool container for the handyman. It was designed for the person wishing to carry out various repairs about the house, and provide a means of carrying all the necessary tools to the seat of work, and also forms a small workbench for doing some of the work on.

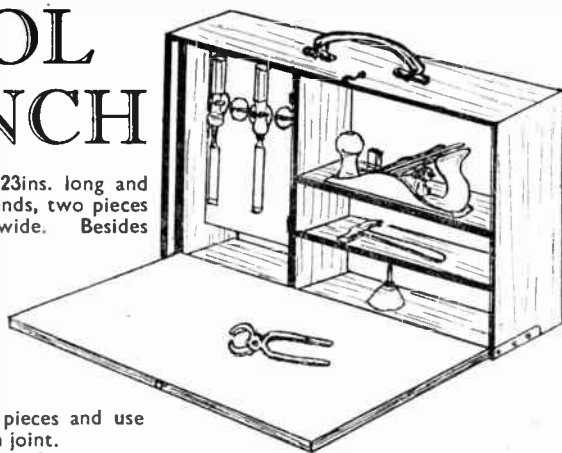
It is quite compact and yet it contains a complete kit of tools easily accessible, and which can be brought into use at a moment's notice. It is not necessary to adopt the layout as given, nor need the size of the case be closely adhered to. You may be interested in engineering or metal work of some kind, and would like the case made into a portable workshop for the purpose.

The wood carver would find that it makes an ideal bench for carrying on his craft with all the tools within easy reach.

The overall size of the case when closed is 24½ ins. long, 14½ ins. high and

pieces of ½ in. plywood 23 ins. long and 5 ins. wide; and for the ends, two pieces 14 ins. long and 5 ins. wide. Besides gluing these together, it would be as well to screw them and make a strong joint, as a considerable strain will be put on the corners when the case is carried about. Carefully drill and countersink the end pieces and use three 1 in. screws for each joint.

You can now cut the outside pieces to fasten on to this framework—two pieces 24½ ins. long and two pieces 14½ ins. long: all four pieces are ½ in. thick plywood. The top and two sides are 6 ins. wide and the bottom piece 5½ ins. wide. Mitre all the corners and glue in position, allowing them to overlap at the back by ½ in. and at the front by ½ in. Fine panel pins about ½ in. long should be used to hold these secure.



all that is necessary is to fit a brass side hook and eye near the handle as shown.

The handle on the top now completes the case framework, and it only remains to put the internal fittings in the required positions. A suitable handle can be bought quite cheaply, or one taken from an old suit case would do very well indeed. Make sure that it is fastened on securely; nuts and bolts would be the best way of ensuring this.

Positioning the Shelves

The actual number and positions of the shelves and internal fittings will depend on the nature of the work to be done, but for general all round repairs the layout shown in the sketch will be found satisfactory.

Wood ½ in. thick will be found quite sufficient for the job. Cut and fit the upright piece first, 13 ins. long and 3½ ins. wide. Place it 7½ ins. from the left side, which will leave 15 ins. on the other side for the two shelves and these are the same width of 3½ ins.

Chisels, screwdrivers, bradawls and files are held in position in spring clips which are obtainable from Hobbies Limited. The 7½ in. space on the left side of the case will just take five of these with a circular back plate of 1½ in. diameter.

In order to hold more tools in a handy position a plywood panel is hinged to the front of the upright partition, and can be fitted with spring clips on each side.

Drawers For Nails?

It would be a good idea to divide one of the shelves on the right side, and fit two or three drawers to hold small goods such as nails and screws. At the back of the top shelf, a turn button through the handle and a slotted piece of wood at the other end holds a tenon saw in position.

The best way of finishing the case is with two or three coats of good oil paint, allowing plenty of time between each coat. The preliminary use of a good quality wood filler will improve the ultimate finish (407)

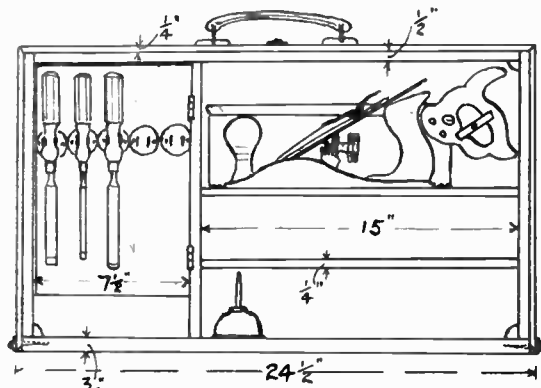


FIG. 1.

These diagrams show the dimensions and general arrangement of the box

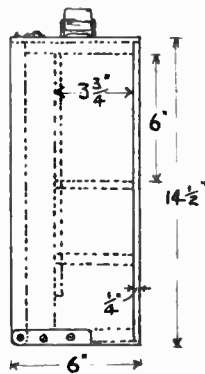


FIG. 2.

6 ins. deep. With the exception of the shelves, all the woodwork is made of plywood, and if care is taken with the cutting and fitting together no difficulty should be experienced. Plywood is always best cut with a fine saw, and for this nothing beats the fretsaw. It may be slower but it will not splinter or damage the wood and it is well worth the extra time taken.

The Sides

Reference to Fig. 1 will show that the sides of the case are each made up of two pieces of wood. First a framework is made of ½ in. wood and then on top of this is placed a layer of ½ in. plywood. Not only does this method give extra strength but it allows the lid, which also forms the bench to fit inside neatly, thus making a tight job.

For the top and bottom cut two

Cutting the Back

The back can now be cut from a piece of ½ in. thick plywood to fit into the framework: the size will be 24 ins. long and 14 ins. wide. Make it a good fit, and glue and pin firmly in position.

The bench part of the case, which also forms the lid, needs to be substantial, and for this purpose a piece of plywood ¾ in. thick is used. It is made a nice easy fit, and will be 24 ins. long and 14½ ins. wide. Reference to Fig. 2 shows the bottom part rounded to enable it to swing easily on the pivot hinges. These are simple to fit and are effective, consisting of nothing more than a long thin screw fitted through the ply outer case. A strip of metal is used to strengthen the pivot hole, and is screwed firmly to the bottom of each side as shown in Fig. 2. To keep the lid fastened,

Tea for two would be pleasant with this TÊTE À TÊTE TABLE



similar amount is also sawn from the bottoms to let them bed flat to the floor. Glue the legs in place. The lower side rails, the exact length of which must be measured across the legs at 9ins. down, are then nailed across on the inside, the ends being trimmed to the splay of the legs. End lower rails are then nailed across, these having their upper edges bevelled a little, to make them level with the side rails, as in detail (C) Fig. 3.

The Top

The table top can be cut in one piece from plywood, or from $\frac{3}{4}$ in. to $\frac{1}{2}$ in. wood of the ordinary kind. As this forms a tray, it should have a lipping of $\frac{1}{2}$ in. by 1in. wood, glued and nailed round, the corners being neatly mitred as at (D). Fix this to the underframe with sunk screws from underneath. This is a quite easy fixing. First, at the chosen spots, bore $\frac{3}{16}$ in. holes, about $\frac{1}{2}$ in. deep, then finish with smaller holes to fit the screws. Drive in until the screw heads disappear in the holes, as at (F). About three screws to each side, and two to each end, will suffice. Be sure the screws are not long enough to pierce the table top.

Fretwood, $\frac{1}{4}$ in. thick, would do for the pull-out trays. Cut these to size, and nail and glue round each a lipping of

$\frac{3}{16}$ in. flat head brass screws. The holes in the metal pieces should be countersunk. Now, with the trays resting on the side rails, screw the metal parts so that the bent portions come over and under the rails, as at (E). They should then be easily withdrawn to the limit of travel. At the centre of each side rail, drive partly in, a brass screw, file the

CUTTING LIST

Legs (4)—2ft. by 1in. by $\frac{3}{4}$ in.
Top—1ft. 3 $\frac{1}{2}$ ins. by 12 $\frac{1}{2}$ ins. by $\frac{1}{2}$ in. (or plywood).
Under frame sides (2)—1ft. 3ins. by 1 $\frac{1}{2}$ ins. by $\frac{3}{4}$ in.
Under frame ends (2)—10ins. by 1 $\frac{1}{2}$ ins. by $\frac{3}{4}$ in.
Lower side rails (2)—* by 1in. by $\frac{3}{4}$ in.
Lower ends (2)—1ft. by 1in. by $\frac{3}{4}$ in.
Sliding trays (2)—10ins. by 8 $\frac{1}{2}$ ins. by $\frac{1}{2}$ in.
Lipping for top— $\frac{1}{2}$ in. by 1in. by 5ft. run.
Lipping for trays— $\frac{1}{2}$ in. by $\frac{1}{2}$ in. by 7ft. run.
*Measure across legs for exact lengths.

FOR afternoon tea, quite a small table is desirable, one that can be moved about as wished. The table illustrated is quite light to handle, and just large enough to hold the necessary tea things. The addition of two pull-out trays on which a tea cup or cake plate can stand, avoids the awkwardness a visitor may feel at trying to hold both tea cup, and cake in the hands. It is called a Tête à Tête, being designed for two people, but, of course, can be used for more.

heads off, leaving pins up against which the trays will butt when pushed in. This will stop them going in too far.

Finishing

This completes the work of construction. For finishing, after the work has been well glasspapered, and the ends of the end lower rails rounded off (they look neater thus) staining and varnishing, or painting can be chosen. Using a decent quality wood, the former finish would suit best perhaps, especially if the stain chosen suits the prevailing furniture of the room. If deal has to be employed for construction, a painted or enamelled finish would serve better.

With an article of this nature a splash of colour can be boldly chosen and not look incongruous a bit. For instance, a bright and even brilliant colour would liven up the room. Using a suitable undercoat, advantage might be taken of the hard gloss paints now so popular, or a flat colour could be chosen and a final coat of clear cellulose lacquer, which does not show up the marks of hot teapot or cups, like the ordinary polish does.

In any case, the result should provide a useful and attractive article of furniture, welcome to the housewife, and an addition to the home of real value. (100)

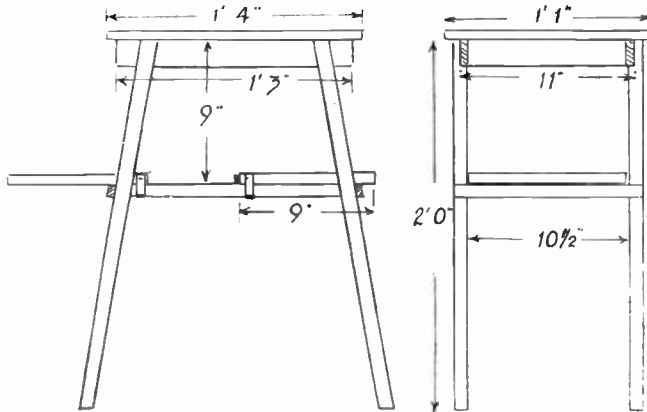


Fig. 1—Front and side views, showing measurements

Fig. 1 shows a front and side view of the article, which is quite easy to construct. Commence by making the underframe of the top. Cut the sides to length, and near each end chisel out grooves, $\frac{1}{4}$ in. deep, at the angle given at (A) in Fig. 2 for the legs. Cut the ends, and join these to the sides with a rebated joint, as at (B), the rebate cut into the sides being $\frac{1}{4}$ in. deep. Glue and nail these parts together.

Making the Legs

Cut the legs to length given, try these in the grooves, and trim off at the top to bring them level with the sides. A

$\frac{1}{4}$ in. by $\frac{1}{2}$ in. wood, to form a rim, and help to prevent the calamity of knocking a cup or plate off the trays with the hands, which could quite easily happen without the rims. These trays are arranged to slide in and out on the lower side rails, one tray being shown fully drawn out in the front view, at Fig. 1.

For fixing, cut four pieces of sheet metal, brass, aluminium or other suitable material, 2ins. long and $\frac{3}{16}$ in. wide, bend $\frac{1}{4}$ in. of each piece to right angles, and at the tops drill a pair of small holes for

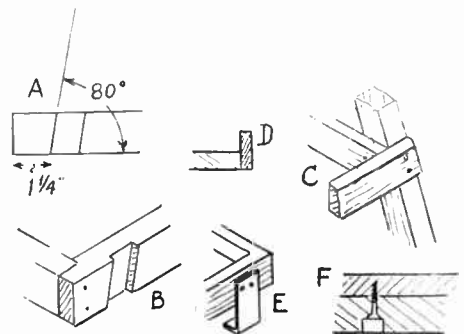
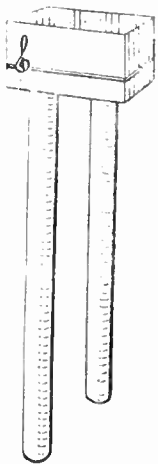


Fig. 2—The grooves for the legs

Fig. 3—Constructional details

A popular household feature— ELECTRIC DOOR CHIMES



DOOR chimes have proved a popular household feature, and their mellow notes are a pleasing change from the harsh ring of the electric bell. The chimes described here can be given a very attractive finish and will prove a useful and neat addition to the entrance hall.

How They Work

Before the construction is begun, it will be helpful to know just how the chimes function. When the bell-push is pressed, an electric current passes through the solenoid (S) Fig. 1, and the plunger (P) is pulled sharply into the solenoid. This causes the protruding end to strike tube (B).

When the bell-push is released, the current stops flowing and the light spring (C) jerks the plunger back so that it strikes tube (A). Two notes are thus given out every time the bell-push is used.

Making the Solenoid

The 'former' on which the wire is wound to make the solenoid is shown in Fig. 2. The end pieces are cut from $\frac{1}{4}$ in. wood and are $1\frac{1}{2}$ ins. square. The tube is $2\frac{3}{8}$ ins. long and can best be cut from an old fountain pen barrel. Alternatively, the tube can be made by rolling glued paper around a piece of $\frac{1}{4}$ in. dowel rod. Drill holes of the necessary size into the

exact centre of the end pieces so that the tube fits in firmly and gives a rigid finish.

The plunger will move more efficiently if brass guides are screwed on to the end pieces. These guides (Fig. 3) can be cut to any size that is convenient, but the centre hole must be only the smallest fraction larger than the diameter of the plunger. This will prevent any sideways 'wobbling' of the plunger. The guides must be fixed so that the centre hole is exactly over the holes already drilled in the end pieces.

The winding is done with 20zs. of D.C.C. (double cotton covered) copper wire, and gauge No. 28 or something near should be used. Leave a free end of 9 ins. before beginning the winding and separate each layer of wire with a layer of gummed paper. This will help to keep the windings even and will give greater insulation. Keep winding in the same direction the whole time and leave a final free end of 9 ins. Finish off with a layer of insulating tape. The completed solenoid is shown in Fig. 4.

The Plunger

The plunger is made from an iron bolt and a short length of brass rod. The iron bolt must be a size that will just slip easily into the solenoid. With a hacksaw cut the bolt to a length of 2 ins. The brass rod is $1\frac{1}{8}$ ins. long and it does not matter if its diameter is a little less than that of the bolt as long as the centre holes of the

guide plates are of the correct size for each end of the finished plunger.

These two rods must be carefully soldered together. If a metal-turning lathe is available the two pieces can be joined as shown in Fig. 5B.

The spring at the head of the plunger can be made from light steel wire. A little experimenting will be necessary to get one of just the right strength; it must not be so strong that it stops the plunger from moving into the solenoid, but must be strong enough to bring the plunger out with a jerk when the current stops flowing.

The Chimes

The chimes are cut from brass tubing. The pitch of the note given out by a tube when it is struck will depend on the length and diameter of the tube. With a diameter of 1 in. the lower-note tube needs to be about 3 ft. long, and the higher-note tube 4 ins. to 5 ins. shorter. To get the note desired from the second

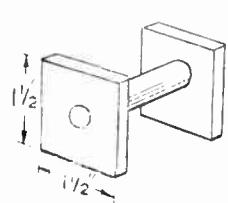
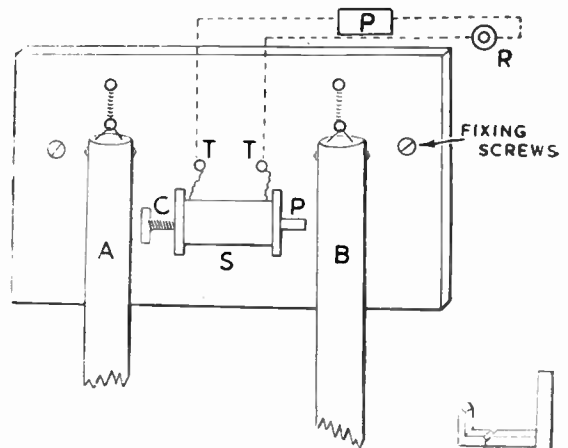


Fig. 2

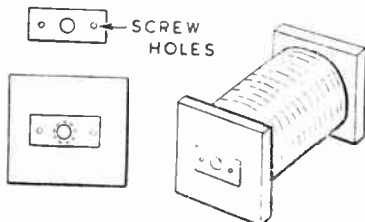


Fig. 3

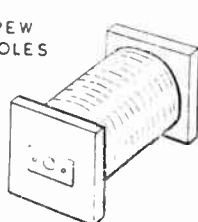


Fig. 4

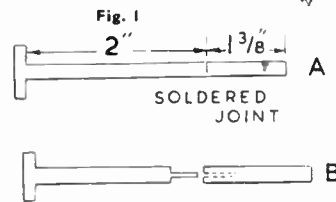


Fig. 5

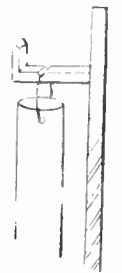


Fig. 6

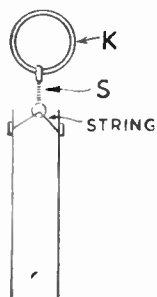


Fig. 7

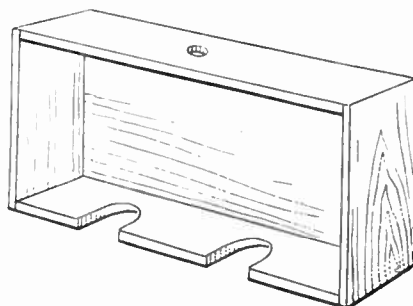


Fig. 8

tube, carefully shorten it with a hacksaw—the shorter the tube the higher the note. A final adjustment can be made by filing the end of the tube.

Now drill a small hole through each tube, $\frac{1}{8}$ in. from one end. The tubes will sound quite well if simply hung from a small hook by means of some fine strong twine (Fig. 6). Notice the small v-groove filed into the hook to prevent the tubes jumping out of position.

Another method of suspension is shown in Fig. 7. (K) is a suitably sized

(Continued foot of page 426)

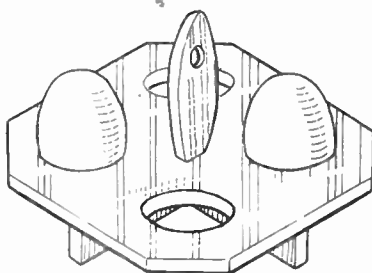
You'll find it easy to make A PLASTIC EGG-STAND

THIS egg-stand is a serviceable, and attractive plastic table model. It accommodates four eggs, and is made from two pieces of Perspex 5 mm. thick. One piece is 5½ ins. square, and the other 1ft. 3ins. long and 1in. wide. The square piece will make the top, and the rectangular one the feet and central stem of the model.

How To Start

First of all cover the square piece with gummed white paper, allow this to dry, and then trim the paper to the edges of the Perspex. Now set out the plan of the top according to Fig. 1. All the shaded areas have to be removed with your fretsaw. The corners are easy. A fretsaw is also used to remove the circular pieces where the eggs fit. Smooth down the inside of each circular cut with a half-round file, and finish off with fine glasspaper.

Now, deal with the little rectangular slot in the centre of the square. To remove this, drill two holes on the long centre line of the slot, and within the perimeter of the slot. File out the rest of the waste with a needle file, but keep inside the marking lines.



The completed stand

From the 15ins. piece of Perspex cut off two pieces each 5½ ins. long. Fit the cut edges one upon the other, fix in a smooth-jawed vice, or between two planed pieces of wood, and draw file to make a perfectly smooth fit. Then cover each piece with gummed white paper, and, when dry, set out the feet as shown in Fig. 2. You can remove the curved waste of these with your fretsaw. These feet will later be fused together in a cross-halved joint as shown in Fig. 4, so be careful about cutting the slots. Remember that the over foot has a slot from the flat

rectangular length ¼ in. downwards. Make a trial fit of these immediately, and then smooth up all faces and put aside.

The Stem

With the other 4ins. piece of Perspex, you can now make the stem of the model. The shape of this can be seen in Fig. 3. Cover the Perspex with gummed white paper, and set out the stem in the usual style. The thumb and finger hole is a circular one made with a No. 8 drill.

For fitting purposes make the pin at the end of the stem 1 cm. long. Then you can fuse this into the top of the stand, and file or cut away the protrusion to correct level afterwards. The fusion is done with a No. 3 paint brush charged with concentrated (glacial) acetic acid, by brushing inside the slot and all over the pin of the stem. If your fit is accurate no external pressure will be required. When you have fused the feet together, too, leave your work for twenty-four hours to settle.

Now you can fuse the feet to the top of the stand. Brush over the upper long rectangular faces of the feet several times with the acid, and carefully place the top on the feet, edge to edge. Two small irons, positioned each side of the stem, will provide adequate external pressure. Again leave your work for a day.

An Attractive Finish

To give the stand its attractive glass finish, work on all faces with an old piece of sock soaked in Silvo, and vigorously rub off the white film with clean silk. (406)

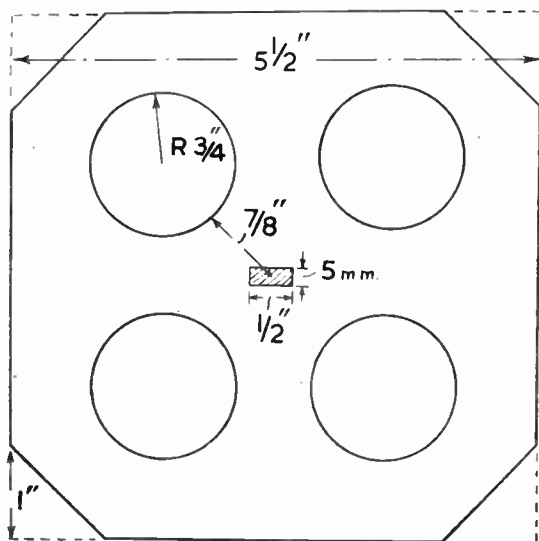


Fig. 1—Plan of the top

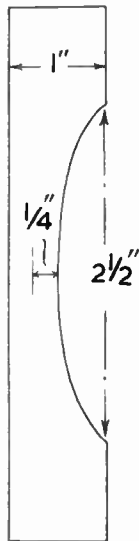


Fig. 2—The feet

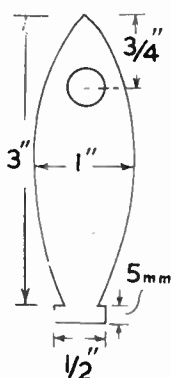


Fig. 3—The stem

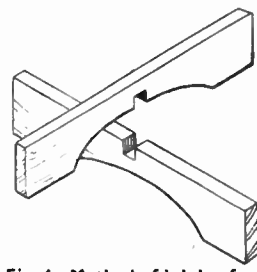


Fig. 4—Method of joining feet together

Electric Door Chimes—(Continued from page 425)

key-ring and (S) a 1in. length of expanding curtain rod into which two eyelets have been screwed.

Cut a baseboard 7ins. by 5ins. from ¼ in. wood, and glue and screw the solenoid into position, as in Fig. 1. Join the wires to the terminals (T) as shown, and hang the tubes so that they are about a ¼ in. from the ends of the plunger. When the chimes are working these tubes will have to be adjusted a

little one way or the other until the plunger strikes them cleanly without any muffling. This will have to be done by gently bending the hooks towards or away from the solenoid.

The Circuit

The complete wiring is shown in Fig. 1. (R) is a bell-push and (P) the source of power. This can be either two 4-volt batteries joined in series, or

an 8-volt bell transformer.

Simple Cover

A simple cover for the solenoid is shown in Fig. 8, and is made to fit tightly over the baseboard. It will be safer for the reader to take the necessary measurements from his own finished model. The cover should be painted to match the decorations of the entrance hall. (119)

A Craftsman's Notebook

Things to Collect

COLLECTING is always a popular hobby, because there is so much satisfaction to be had out of hunting for specimens to make the collection grow. Some people go in for general collections, others prefer to specialise. One young gardener favours cactus plants, which thrive in small pots without much attention and offer plenty of scope for adding different specimens.

The summer months provide lots of opportunities with such subjects as leaves and flowers, and later on there will be pleasant winter evenings devoted to arranging the pressed specimens and writing up informative notes. Such a collection makes a useful guide to the identification of trees and plants.

For woodwork enthusiasts screws and nails have interesting possibilities, for it is surprising how many sorts there are. Another idea is to get together a small example of the various kinds of wood, and one might even consider building a novel piece of woodwork containing an example of each.

I heard recently that bottle labels are enjoying a vogue, and one can imagine how much material there is to go at in this line, more so if labels from jars and tins are included. For a really colourful collection, tinfoil wrappings would take some beating. Cigarette and other small packets might be considered, also the papers from different brands of tobacco.

Lawn Mowings for Rabbits

NOW that the lawn cutting season has come round you can avail yourself of some cheap, wholesome food for your rabbits, a handful or two in the hutch being appreciated as an extra to the regular menu. The clippings should be young and fresh.

A supply may also be put in store for winter use, the mowings being dried either by spreading them out in the sun on the garden path, or in a warm oven. Turn the cuttings occasionally till dry, and if they are dried in the oven, remember to leave the door slightly open to allow escape of moisture.

Rub up the dried cuttings and put away in bags or boxes for later in the year when the fresh stuff is not obtainable.

Extracting Difficult Screws

ONE occasionally comes across a screw which it is almost impossible to remove in the ordinary way. But before resorting to the final drastic step of cutting into the woodwork try these dodges.

First, the simple expedient of placing the screwdriver in position, then giving it a few sharp taps with a mallet. If this

fails, try running a little paraffin or oil around the head of the screw and repeating as previously.

A hot poker applied to the head of a difficult screw will sometimes do the trick, the heat causing it to expand, and on cooling it may contract sufficiently to loosen it for removal.

Making Up Solutions

AS amateurs who practise home chemistry and photography must frequently make up solutions, these hints on the subject may be of value. In the first place, water ought not to be poured on to the chemical. The method is to bring the water to a gentle swirl with a stirring rod and sift the powder in gradually. In this way there will be less likelihood of the chemical clogging into hard lumps which take longer to dissolve.

A few jars marked off with paper strips to indicate different quantities are a useful aid. The best method is to dissolve the chemical in a small quantity of water first, then add further water to bring it up to the amount specified in the formula.

Certain chemicals (e.g., potassium carbonate, sodium carbonate) are best made up in cold water, but the majority (e.g., hypo, alum, hydroquinone) can be safely and more quickly dissolved in a little hot water, after filling up with cold.

To make up a percentage solution so many parts of solid are taken and made up to 100 parts with water. Thus, 100ozs. of solution in which you have dissolved 10ozs. of chemical is a 10 per cent solution. 1 pint of water is equivalent to 20ozs.

A Nature Note

MORE than once I have seen a thrush noisily breaking shells on a stone, though not at such close quarters as recently. This indifferent bird was not a bit concerned at my presence, so I was able to watch the procedure to the finish. The finishing touch was rather surprising.

After extracting the snail from its shattered shell, the thrush grasped it in its beak and proceeded to pound it vigorously on the ground before finally swallowing it and going in search of more.

This little episode brought to my mind an earlier one when I espied a thrush fiercely trying to tug a worm out of the lawn. So great was the effort the bird was eventually compelled to relax its grip, presumably to muster strength for another attempt. But its victim quickly seized the opportunity provided by the momentary respite to withdraw to safety.

Five Fine Models

These splendid galleon models were constructed by Major W. E. G. Hurdle, of 527 B.S.E., Motor Trans. Unit, G.S.O., B.A.O.R.I., who was good enough to send us the photograph.

They are all from Hobbies Kits, and the sight of such a fine 'fleet' should serve as an inspiration to those modellers who have not so far tackled galleons.



Interesting pictures can be made by having a PHOTOGRAPHIC AQUARIUM

It is not a simple task for the amateur photographer to take pictures of aquatic life in the natural state: too much complicated and expensive equipment is required. To surmount this difficulty it is possible to construct a simple aquarium which, though small, gives the desired results.

It is made from a solid block of wood, and being narrow does not allow distortion of the photographs.

The block should be about 15ins. square and a few inches thick. Saw out the centre, leaving an edge of 2ins. or 3ins. There is then a frame of wood, and this must be given several coats of enamel or paint. This is to waterproof the wood, and to prevent it swelling. With the last coat of enamel a sheet of glass is cemented, using fine ordinary cement, on to either side of the frame. When this is completed you have a small aquarium of 13ins. or so high, 11ins. long, and 3ins. wide (see Fig. 1).

Outlet and Inlet Pipes

2ins. from the top of the wooden frame bore a small hole to take the outlet pipe. When small fish and other creatures are in the aquarium for the purpose of photography there must be a continual flow of fresh water. Above the aquarium have a tank containing a supply of river water, and allow this to flow slowly by means of a rubber pipe

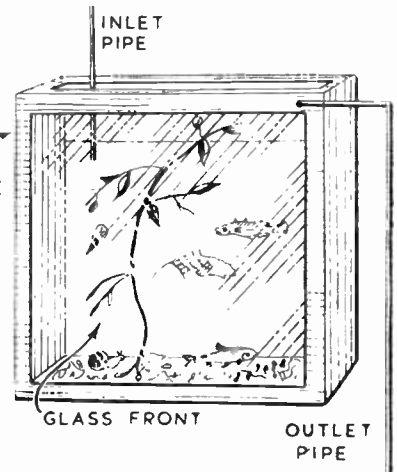
hanging into the aquarium. Over the outlet pipe tie a piece of muslin to prevent the escape of water beetles and the other smaller specimens.

Photographing Water Life

It is not wise to leave water in such a simple aquarium for any considerable length of time. Its purpose is only to serve as a means of taking pictures of aquatic life; and it should not be used as a permanent aquarium. When it is desired to take photographs place a piece of white paper behind it; this will throw into relief the creatures to be photographed.

Water beetles, minnows, sticklebacks, gudgeon, water spiders, water snails, crayfish, and water plants, can all be used as models. It is not wise to place too great a variety of fish in at once, as many have carnivorous tastes. Photograph the fish in pairs, adorning the aquarium with different settings of weed and the other water creatures. A coating of sand can be put at the bottom, and the weeds arranged to appear as if they are growing. A few pebbles can also be scattered about the bottom.

Arrange the whole lay-out of the aquarium first, and lastly introduce the main subjects. Do not, of course, include the frame in the picture; and a



bright light used at the moment of taking the photograph should not be left to shine on the aquarium longer than is necessary.

Other creatures which form excellent models for the fascinating subject of aquatic photography are tadpoles, in their various stages, frogs, newts, and all small fresh water fish. Frog and toad spawn, and the nests which smaller fish build from twigs and minute particles of stone, are also very good subjects. (344)

A Seedbed Marker and Rake

THE keen gardener is always on the look out for improvements that will not only make the work much easier, but will yield better results. The subject of this article is a useful little tool designed to fulfil both these requirements.

On one side are two adjustable 'V' shape markers for setting out parallel rows of drills at any distance from 4ins. to 18ins. apart. By reversing the tool we

well worth the time spent in its construction. A piece of wood 21ins. long, 2ins. wide and 1in. thick is needed for the marker portion. Cut two slots 8ins. long and 1/2in. wide at each end, as shown. The best way of doing this is to first drill 1/2in. holes at the ends and cut out between with a keyhole saw. There is a space of 1/2in. on one side of the slots and 1in. on the other, and also 1in. at each end.

Glasspaper the slots quite smooth. Drill a hole in the centre of the length of the bar about 1in. diameter for a handle. To ensure a more even balance, make the centre of this 1 1/2ins. up from the marker edge.

well for this and a 3/8in. bolt with wing nut completes the part.

Making the Rake

The rake is made on a separate strip of wood and then screwed on to the marker bar. A piece of 1in. square hardwood 16ins. long is cut and drilled to take the nails, as shown in the sketch.

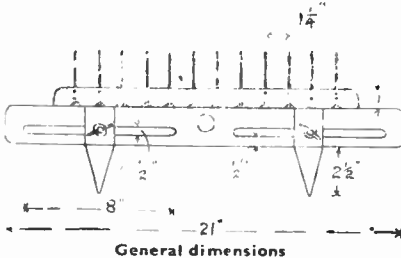
Twelve wire nails 3ins. long are placed 1 1/2ins. apart. Make sure that the nail holes are not drilled too large, nor must they be made much smaller than the nails for fear of splitting the wood. Countersink the holes so that the heads are flush with the wood bar.

The rake can then be fixed to the marker with about four wood screws, shorter ones being used for the ends so as not to come through the slots.

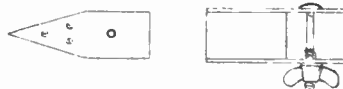
To fit the handle taper the end slightly to fit the marker bar hole easily, cut a slot in the end and wedge it firmly in position. The length can be made to suit the gardener's particular fancy, but a good size is between 4ft. and 5ft.

In order to protect the tool from the weather it can be painted or else a coat of varnish would do just the same.

The marker can be made wider if desired, but the tool described here is a good all round size. (387)



General dimensions



Details of the markers

have a small rake for covering over the drills when the seeds have been sown. This avoids having several tools lying about the ground, as it is a dual purpose one.

The tool is quite simple to make and is

The markers can now be made, and they consist of wedge shape pieces of wood 2 1/2ins. long which slide along the base of the bar. To achieve this a piece of sheet metal is screwed to either side of the wood wedges and bolted through the slots. Sheet iron or brass will do very



INTERESTING BRITISH STAMPS

THIS week we want to have a look at the pages of the stamp album devoted to the stamps of Great Britain. Nearly everyone is fully aware that the first adhesive stamps were issued in 1840, and that one of them is called the 1d. black. Some are not quite sure if that was the only stamp issued, others know that at the same time there was issued the 2d. blue.

Quite a number of people are unaware of the fact that at the same time of issuing the 1d. and 2d. stamps we had postal stationery on sale. Possibly the mention of the 'Mulready' envelope or cover may remind these people of this early facility.

Again there were two, the 1d. printed in black and the 2d. printed in blue. The first illustration shows the front of one of these. As you can see it has been through the post and the cancellation mark—the Maltese Cross has been applied to cover the figure of Britannia. These Mulready envelopes, however, were by no means favourably received.



They were the subject of a considerable amount of ridicule and occasionally one can buy a number of cartoons of these envelopes. They were made of 'Dickenson Paper'; that was paper with two fine threads so impregnated that each envelope had two visible. Similar paper was used in 1847 and 1854 for the printing of the embossed 10d. and 1/- stamps.

The fourth illustration is one of the 1d. red stamps which followed the 1d. black quite quickly; the reason for the change being the difficulty of obliterating the black stamp, or rather the difficulty of seeing the obliterating mark. But if you look closely you see that there are two lines about 1/4 in. apart and between them you see the letters 'O.U.S.' and these refer to the words 'Oxford Union Society'.

Now postal orders were not issued by the post office until 1881, and until that date, sums of money could be paid by

stamps, and these were made available to University students, so that it was advisable to have some distinguishing mark in order to trace any stamps that might be stolen.

In 1867 the Government allowed firms to have their name printed on the back of stamps. Not very many firms took advantage of this method of advertising; the chief were W. H. Smith & Son, Great Eastern Railway (G.E.R.), Copestake, Moore, Crampton & Son and J. & C. Boyd & Co. (some others had their name printed over the gum).

The Government at the time of printing these names made the Oxford Union Society have their name on the back instead of the front. You should look at the back of all the red 1d. stamps that you see and keep those that have the names on the back.

Another type of advertising on the back of stamps comes to notice in 1881 when the 1d. stamp had the words 'PEARS SOAP' printed on some of them. The same words appeared on the 1/2d. of 1887, the vermilion stamps. That is the one of which you see the back as the third illustration. Not only

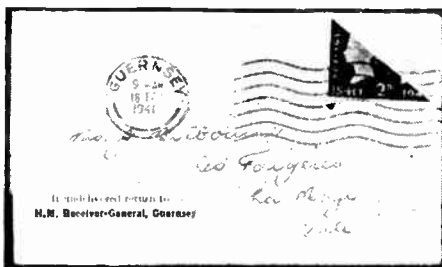
lines quite close together. But if you look at the stamps of the 1934 set, then you will notice that the lines cross, so that the background is composed of a network of horizontal and diagonal lines.

If you go in for water marks, then you have a lot of work to do, for even among the low values there are numerous varieties to look for, in fact it is in the low values that you will have to search. The normal stamp has as the watermark a Crown and G V I R but many of the stamps are made to go in booklets.

These you will often find with an inverted watermark. Others are made to be sold out of the machines and these will often have a watermark sideways.

Now you should look for these, and do not be put off by saying to yourself that you do not go in for watermarks; you will have to start sometime and why not now and in the stamps of your own country? They are more easy to understand than stamps of foreign countries which will have watermarks such as you do not understand.

The second illustration is one



Queen Victoria with back advert.

then should you look out for the small letters O.U.S. and the small names of firms but also you should look out for the letters as shown.

You must not expect to find a lot of them because it is not at all likely that you will, for although the stamps are not valuable, yet they are quite hard to find. But you do get a kind of thrill when you do find one after a very long search.

So far as sharp eyes are concerned there are quite a lot of interesting items which can be found by those who keep their eyes open. For example, the King George V 1d. stamp with the lion at the base. There are two types of this, one with the lion fully shaded and the other with very little shading on the lion.

Again, in the higher values of the King George V stamps the 2 1/2 and above, if you look at the background of the portrait of H.M. King George V in the 1913 issue, you will see it is composed of a great number of horizontal

of the Channel Island bisects. On 18th February, 1941, while the Island was occupied by the Germans, the supply of the 1d. stamps gave out. In consequence permission was given for the 2d. stamp to be cut in half and each half used as a 1d. stamp.

Naturally these must be collected on the envelope and they must show some of the postmark. Otherwise one might take a 2d. stamp and cut it in half and say that it came from the Channel Islands. You see now why people are careful to collect stamps on the envelope.

There is something else interesting about this stamp. If you look very carefully at the stamp then you will see the date 18 Feb 1941. But look at the last figure, the '1'. Can you see that it is not a straight 1? It is said that the date stamp was without the figure '1' so the postal authorities took the '0' of the previous year, chipped a piece out and used the broken figure 0 as a 1.

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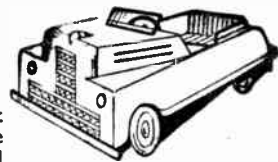
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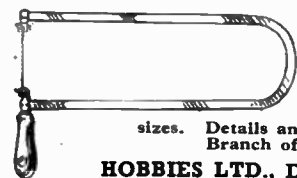


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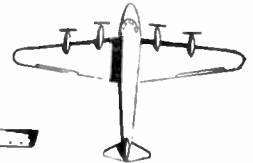
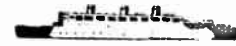


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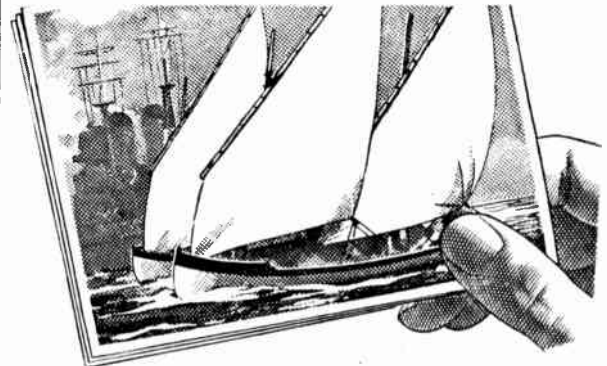
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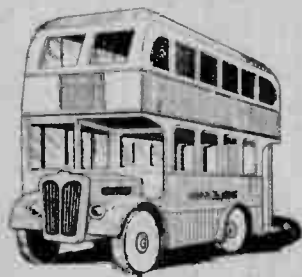
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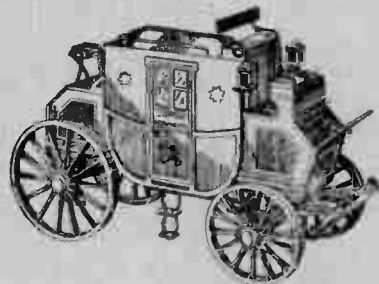
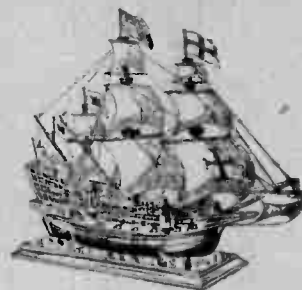
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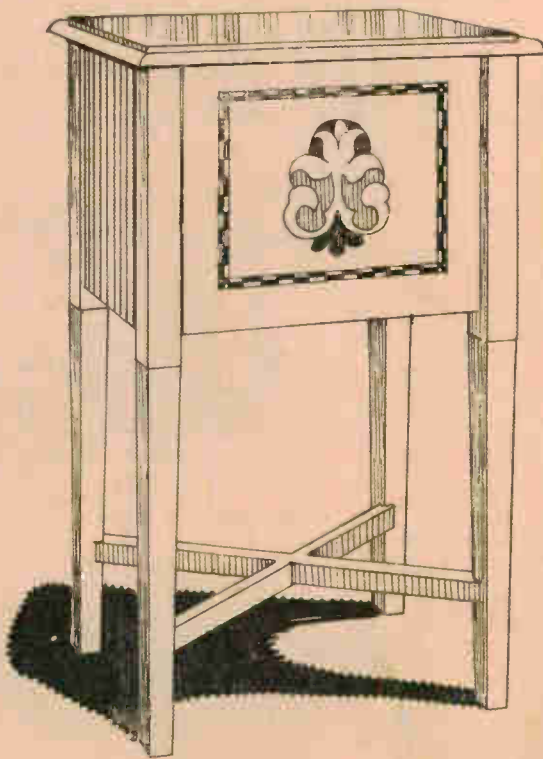
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April 11th, 1951

Price Fourpence

Vol. III No. 2893



OUR illustration on this page shows a useful work table. At a glance it can be seen that the decoration is simple and not over elaborate. It consists of either a simple fretted overlay in some thin wood, or an inlay panel in three varieties of wood.

Any of the better class woods may be used for the cabinet; oak, walnut or mahogany being our choice. Oak and mahogany are now fairly plentiful and can be obtained in suitable panels. Walnut, on the other hand, is almost impossible to get, but small thin stuff suitable for cutting up for inlay work might be obtainable from some timber buyers.

13½ ins. square by ¾ in. thick; two cross stretcher rails, each 18 ins. long by 1½ ins. deep, by ¾ in. thick; and some thinner wood for making the interior compartment.

The Legs

As will be noted, the legs are 27 ins. long when finished, but an extra ¼ in. or so should be added to this to allow for trimming off at the top, and should be planed away after tenoning in the panels. The taper of the lower 15 ins. of the legs should be as shown in Fig. 2, gradually decreasing from 1½ ins. to ¾ in. at the feet.

The panels forming the box are let into the legs for a distance of ½ in., and

Make this handsome WORK TABLE CABINET

The overall dimensions of the table are: height 27½ ins. by 16 ins. square on top. By reference to the diagrams, Figs 1 and 2 and the constructional details Figs. 3 and 4, the amateur cabinet maker should experience no difficulty in reproducing the design.

The parts required are: four legs each 27 ins. long by 1½ ins. or ¾ in. square; four panels for the sides of the cabinet 13 ins. wide, by 11 ins. deep by ¾ in. thick; one top, overall 16 ins. square; one floor,

the grooves made in the latter must be set out as shown in the enlarged section in Fig. 2. Groove the legs cleanly and accurately so as to get a sound fit when the panels are knocked together.

If desired, instead of grooving in the panels, they may be tenoned into the legs, two tenons being made on the end of each panel. Along the bottom inside edge of each panel glue and pin a bearer fillet (F in the enlarged detail in Fig. 1) for the floor. These fillets should be about ¼ in. square and may be of softer wood than the rest.

The floor can be in two or even three widths to make up as required, and the corners must be checked to fit neatly round the legs inside.

Interior Compartment

The interior box compartment can be made from ¾ in. thick wood, and measurement should be made direct from the made-up box in setting out the two parts required. First glue and pin a ¼ in. square fillet to one side of the box at a distance of 4 ins. down from the top of the leg. Then cut a piece of ¾ in. wood for the floor. This should be 4 ins. wide, and, like the main floor, it should be checked at the back edge to fit round the legs at each end. Glue and pin this piece in place, and, if necessary for bearing strength, add ¼ in. square fillets under each end before the front of the compartment is set in place.

For this front we shall need a piece of similar length wood to the floor, and 4½ ins. in width. Round off the lower

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

edge of the piece and make it smooth, so that fingers and hands are not injured when material is being taken from the box. Nail and glue the front to the floor so that its top edge lies flush with the sides of the box. Then take off the sharp edges of the box sides and also those of the front of the interior box.

Cross Stretcher

Next prepare the cross stretcher rails for the lower part of the legs. Turn the whole article upside down, and measure down the legs 4 ins.—that is, the height the rails will be off the floor.

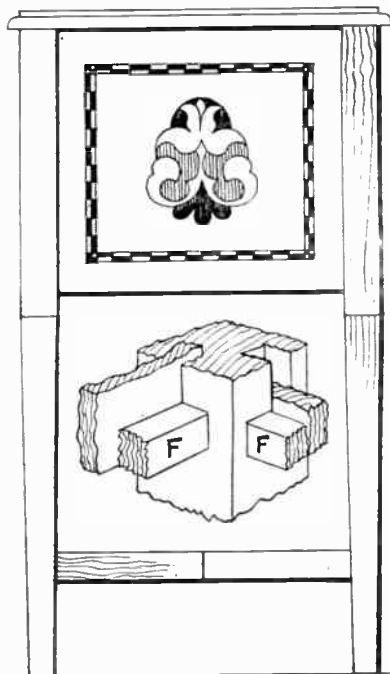


Fig. 1—Front elevation

Form open notches in the angles of the legs for the rails to fit in, and check measure carefully for the length of the rails. These are halved together in the centres, and fixed to the legs by means of screw eyes driven horizontally into the legs before the rails are glued in, and screws vertically through the eyes into the stretcher rails when they are put in place.

The Lid

The lid of the cabinet is made up of four rails each 16 ins. long by 2½ ins. wide by ½ in. thick. These are cut to 45 degree mitres at the ends, to form a square

frame which is held well together when the top overlay has been added (see sectional diagram Fig. 3). The mitres of the frame are glued together, and when the overlay is added on top, screws with countersunk heads are run in to the frame and the screw heads filled neatly with stopping. This stopping must be glasspapered level and made neat in readiness for the finish of stain and polish.

The lid frame may be further stiffened by adding wood angle blocks as shown in Fig. 3.

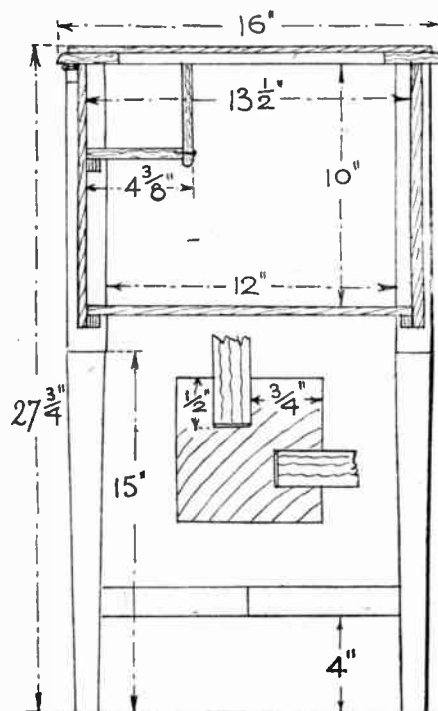


Fig. 2—Section showing measurements and construction

A small section rail is added to the back panel to take the recessed hinges as shown in Fig. 4.

Decoration

The decoration, given full-size on page 447 may be put on the front of the cabinet only or on the front and two side panels. The simplest form of decoration would, of course, be the overlay shown at the top of the page. This consists of just a plain fret-cut panel, the pattern from the sheet being stuck down to the wood, cut in the usual way, and glued on the panel. The inlay banding, a useful portion of which

is shown on the pattern sheet, is 'cut-in' the panel—the depth of the wood used—about ⅛ in. or, perhaps, less. Then the two varieties of wood are cut at one time to the pattern shown and the pieces carefully glued in the grooves. A hammer previously dipped into boiling water being used to press the banding in place.

After a day's interval the inlay may be cleaned off or surfaced with a scraper and glasspaper. The process is similar for the centre inlay medallion shown full-size as a pattern. First find the exact centre of the panel or panels and proceed to trace the design and transfer it to the three varieties of wood, each piece being ⅛ in. thick and about 6 ins. by 5 ins. Use a fine fretsaw for the cutting and take care of each section of the design for replacement.

Now lay all the pieces in their respective places on the panels, and, holding them firmly in place with one hand scratch round the outline with a needle point, and then, with suitable tools, ground out to a bare depth of ⅛ in. Glue the woods in the recess and repeat the hammer process described.

Inlay Done First

It should be pointed out that all the inlay work must be done before the assembly of the cabinet, so that the work can be carried out on a flat, firm base. The grounding out work for the inlay is by no means an easy task, and some workers may choose to make up the inlay panels as overlays, by gluing them flat on the surface of the wood. The effect would be almost as good when the whole inlay surface had been glasspapered smooth and then wax polished or varnished. The choice of the actual finish to be put upon the wood of the cabinet, legs, etc., may be left to the individual worker. (404)

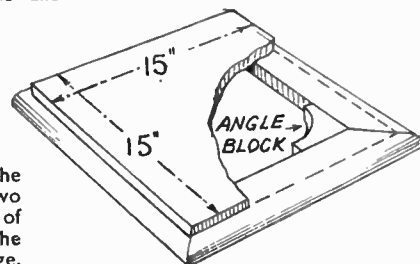


Fig. 3—Details of the lid

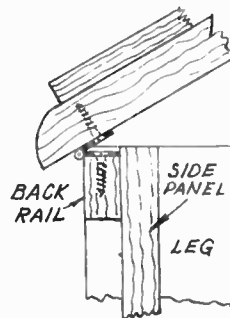


Fig. 4—Fixing the lid

The pattern for the inlay is given full size on page 447

Please the kiddies with a MODEL FARM ELEVATOR

NOWADAYS, the modern farmer uses elevators for all kinds of hoist work, besides their original purpose of haymaking; so that every model farm set should include one if it is to be really complete. Although similar in principle, they vary greatly in pattern according to their use; but the little model shown here is of the type often employed in the hayfield and for hoisting sacks up into a granary and similar jobs.

When they were first introduced into this country, elevators were operated by horse power, and it was customary then to see the patient horse walking round and round in a small circle, pulling a single horizontal shaft which turned an ingenious gearing-up device on the ground connected by belt to the elevator. Now, of course, either a small petrol engine, portable electric motor, or tractor is usually employed. Our little model, therefore, is designed for operation with a small electric or clockwork motor.

The measurements given are for a model 10½ ins. long, which makes a useful-sized toy in itself, but it could, of course, be easily scaled down, if necessary, to be in proportion with any other farm equipment that the modeller may have already made. Wood of ¼ in. thickness is allowed for, except the wheel blocks which are cut from 1 in. by ½ in. or something similar, and the wheels themselves which are from ½ in. wood. The only other requirements are the belt, which can be cut from a length of old inner tube, and some oddments of ½ in. and ¼ in.

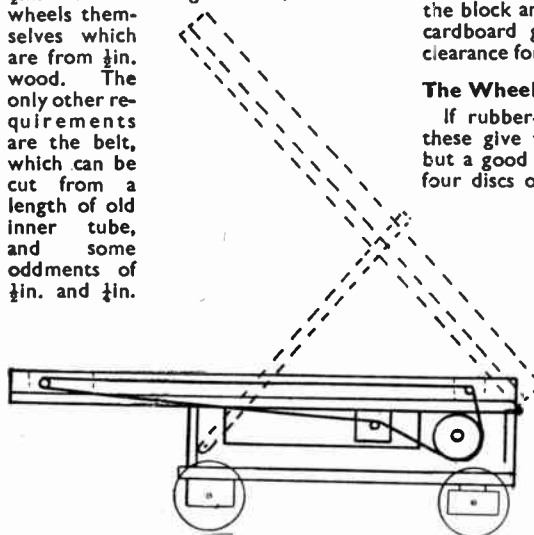
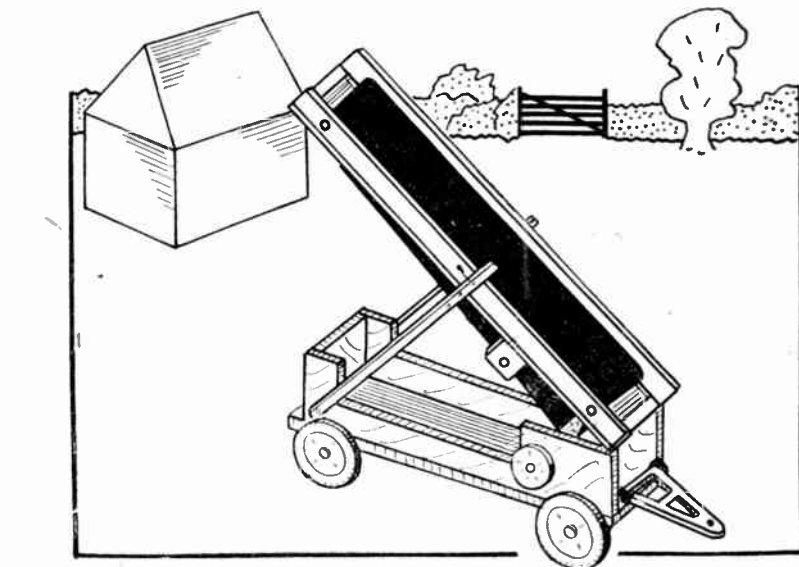


Fig. 1—Side view of the elevator

dowelling, with two small pieces of strip brass or tin for the towing-bar brackets.

Cutting Out

A general view of the elevator, with the belt down, is seen at Fig. 1, the dotted line indicating the raised position. The base of the chassis is a board 7 ins. by 3 ins., upon which the sides, cut as shown at Fig. 2, are mounted. The two



ends are 2½ ins. by 1½ ins., making a box-shaped arrangement upon which the belt-housing rests when not extended. To carry the wheels, cut two pieces 3½ ins. long from the 1 in. by ½ in. material. The back piece is simply screwed to the base, but the front one provides the steering by being held to the base with a nut and bolt, as shown at Fig. 3. Between the block and the base is a strip of thick cardboard glued to the block to give clearance for the steering.

The Wheels

If rubber-tyred wheels are available, these give the model a modern finish, but a good imitation can be made from four discs of wood 1½ ins. diameter and ½ in. thick. The outer edges are serrated diagonally with saw cuts to suggest the tread of the tyres, and when the model is painted, this edge and a ¼ in. rim is finished off black. This type of wheel is

held to the blocks with screws through the centre. Note that the screw will enter the two back blocks a fraction lower down than at the front, to allow for the additional thickness of the steering clearance and still keep the model horizontal. See that the wheels spin nicely on the screws, but do not give the screws more than just a start into the blocks, so that when screwed nearly in they hold the wheels on firmly.

Belt Housing

This is shown in plan at Fig. 4. It consists of a baseboard 10½ ins. by 3 ins. upon which are screwed two strips each 10½ ins. by ½ in. Before screwing these strips down each side, however, fret the baseboard at both ends, for the belt openings, as shown, and fit the runners. These are two pieces of ¼ in. dowel 3½ ins. long. Holes of ¼ in. diameter are bored for them in the sides of the belt-

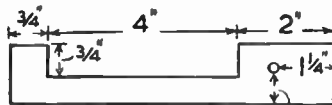


Fig. 2—Detail of sides

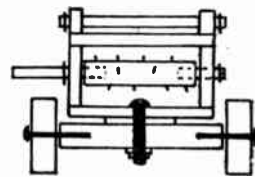


Fig. 3—End view, showing pivot arrangement

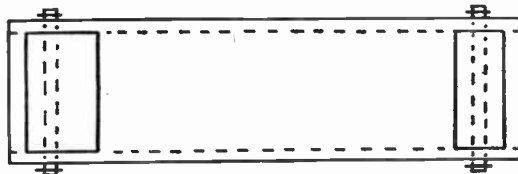


Fig. 4—Plan of belt housing

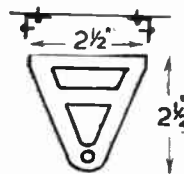


Fig. 5—Towing bar

housing immediately over the slits in the baseboard, and they are held in place with a pin through at each end. Glasspaper the dowels as necessary, so that they turn smoothly in the holes.

A similar runner is fitted to the underneath side of the belt housing as shown, to take up the belt and keep it on to the driving drum. The runner is again $\frac{1}{4}$ in. dowel, but only 3 ins. long. Cut two pieces $\frac{3}{4}$ in. square, bore $\frac{1}{4}$ in. hole in each in identical positions, then glue them on to the underneath side of the belt housing. Set them in $\frac{1}{4}$ in. from the edges, so that when the spindle is fixed in the holes and held at each end with a pin, it does not project outside the edge of the belt housing. There should be about $\frac{3}{8}$ in. space between the dowel and the underneath surface of the belt housing, through which the belt will be threaded.

The Drive

Cut a piece of $\frac{1}{4}$ in. dowel to a length of 2 $\frac{3}{8}$ ins. and bore down each end with a $\frac{1}{4}$ in. bit to a depth of about $\frac{1}{4}$ in. To give a grip to the belt a number of small nails are driven into this dowel at various places all round it. Cut off the heads of the nails and file them down until they project only a fraction out of the dowel, to give a grip to the belt but not sufficient to cut it. Cut a piece of the $\frac{1}{4}$ in. dowel to 1 in. long, and another 2 ins. Hold the drum in position, and try the two pieces through the sides of the model into it. A little glasspapering may be necessary to ensure that the drum spins nicely. Then fix the $\frac{1}{4}$ in. dowels inside the thicker piece with a spot of glue, and secure the whole in place with a pin through either side. On the longer end of this spindle is fitted the driving

CUTTING LIST

(For wood of $\frac{1}{4}$ " thickness except where stated)

No. of pieces	Description	Size
1	Chassis base board	7" x 3"
2	Chassis sides	6 $\frac{1}{2}$ " x 1 $\frac{1}{2}$ "
2	Chassis ends	2 $\frac{3}{4}$ " x 1 $\frac{1}{2}$ "
2	Wheel blocks	3 $\frac{1}{2}$ " x 1" x $\frac{1}{4}$ "
4	Wheels	1 $\frac{1}{2}$ " diam. x $\frac{1}{4}$ "
1	Belt housing base	10 $\frac{1}{2}$ " x 3"
2	Belt housing sides	10 $\frac{1}{2}$ " x $\frac{1}{2}$ "
2	Stays	6" x $\frac{1}{2}$ "
1	Towing bar	2 $\frac{1}{2}$ " x 2 $\frac{1}{2}$ "
2	Belt housing runners	3 $\frac{1}{2}$ " x $\frac{1}{4}$ " dowel
1	Belt housing runners	3" x $\frac{1}{4}$ " dowel
2	Belt housing runners bearers	2 $\frac{1}{2}$ " x $\frac{1}{2}$ " dowel
1	Drum spindle	1" x $\frac{1}{2}$ " dowel
1	Drum spindle	2" x $\frac{1}{2}$ " dowel
1	Driving wheel	1" diameter (3 ply)

wheel. This is made up sandwich-fashion from two discs of thin wood $\frac{1}{16}$ in. in diameter with a piece of stout cardboard between them $\frac{3}{4}$ in. diameter. When the glue is dry bore through with a $\frac{1}{4}$ in. bit, and glue the wheel on to the spindle.

Fixing the Belt Housing

The belt housing is fixed to the chassis with two small hinges at the front, as shown. To hold it in its raised position cut two thin strips 6 ins. long and $\frac{3}{16}$ in. wide and bore several holes in each, towards one end, in identical places, to give alternative heights for the belt. Fix these two stays with screws to the side of the chassis. At the other end, bore a suitable hole in each side of the

belt housing and put a small screw in about 1 in. away. Make two small pegs and attach them to the screws with string or wire, so that they can be used to peg the belt housing up at any required height. When not in use these arms fold down until they rest on the projecting ends of the driving spindle.

The Belt

This is best cut from rubber, and an old cycle inner tube serves well, though stout paper would suffice. Cut the tube through and slit it all the way down. If it is more than 2 ins. wide when opened out, trim it down to this. It needs to be about 20 ins. long. Thread it through the elevator belt openings, round the drum and up over the bearer on the underneath side of the belt housing. Pull it fairly tight and secure the ends with rubber solution, holding them or putting a pin in temporarily until the solution is dry. Make sure the belt is tight enough to be driven by the drum, but not too stiff to be worked by the motor. A little graphite from a lead pencil rubbed in the spindle bearings helps it to work smoothly.

Towing Bar

A suitable shape for the towing bar is given at Fig. 5. Cut two pieces of brass strip 1 in. long and $\frac{1}{4}$ in. wide, mark them into two halves then bore holes in the centres of each half. Bend them to a right-angle and fix them on to the front of the chassis with screws. The towing bar is then held between these two brackets by means of a screw at each side, as shown.

Finish the model carefully with bright red enamel, outlining each part with black. (405)

Wighton House, 206-212 St. John Street, London, E.C.1.



Electric Signals

COULD you tell me how to build and manipulate electric signals in such a way that when the red light burns, current will be cut off from the section on which the train will run? (L.A.—Antwerp).

ANY section of the line could be made to operate in the manner you suggest, by the use of a single-pole two-way switch. This should be wired so that when in one position, current is supplied to the red light, and when it is turned to the second position, current goes to the section of line in question (and green light, if used). It will, of course, be necessary to keep the conductor rails of such sections of track electrically insulated from the other sections, in order that any particular section can be cut out, without the whole track being influenced. The outer rails, and one lamp terminal, should be permanently wired to one electric

supply point, the second of which goes to the switch mentioned.

Hot-air Incubator

I SHOULD like to make the hot-air incubator described in 'Hobbies Weekly', so would you send me further details, such as what lamp and heater, etc., to use? (P.C.—Lowestoft).

SUCH fittings as capsule, thermometer, lamp and heater are best purchased. You could buy a burner and solder it to a metal container for the lamp, but the saving is scarcely worth it. The heater is a somewhat complicated piece of work, and would require a whole illustrated article to explain, besides needing metalcraft to make. As it is a vital part of the machine, it is far wiser to purchase one than to make one, as the efficiency of the whole depends upon it. The fittings mentioned can be obtained from S.P.B.A. Supplies Ltd.,

Curing Rabbit Skins

REGARDING your notes on how to cure rabbit skins, I get in difficulty as I find the hairs come off in handfuls. Could it be because I take off the very fine skin, or what do you suggest? Could you tell me what instrument to use for scraping the fleshy part of the skin? (D.F.—Alness).

THE loss of hair 'in handfuls' suggests that you have reduced the pelt too much, or the rabbit may have been caught at the moulting season, left too long before skinning, or the pelt may have been improperly treated. In no case should any part of the pelt be cut away. The usual method of preparation is to place the pelt in an alkaline bath, then with a wooden tool, somewhat like a butter-pat, work out the moisture, then fix a blunt-edged knife in an upright position and draw the fleshy side of the pelt gently to and fro to remove any fleshy material and prevent any unevenness. The pelt is then greased and beaten, kneaded and finally cleaned in hot dry hard sawdust, shaken out and beaten on a leather cushion or the like.

Any handyman should be capable of making this MOTOR-CYCLE GARAGE

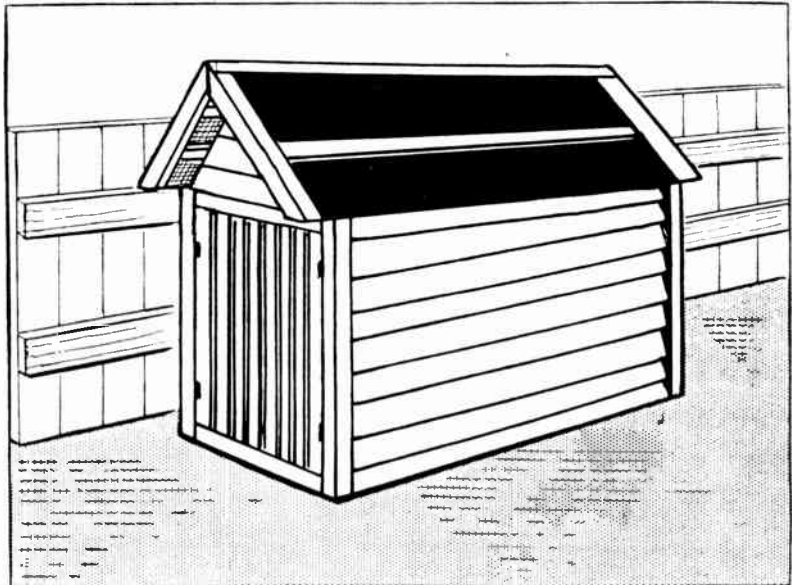
It is false economy to spend a fair sum of money on a motor cycle and then to protect it from the weather only by throwing a tarpaulin over it.

Admittedly, a sectional motor cycle garage is by no means cheap to buy nowadays, but any fellow who can handle a saw, hammer and screwdriver should be able to make a garage of the type illustrated. It is not too large a building (measuring rather more than 8ft. long and 6ft. high overall), and if not required for storing a motor cycle it will always come in useful for the humbler push-bike, or even serve as a tool shed.

Red deal or other softwood would be ideal for the construction, but except in the form of salvaged timber this is difficult to come by. Some of the recently imported tropical hardwoods, however, are quite cheap, easy to work, and licence-free, so a chat with a local timber merchant should solve the problem.

Starting The Work

The work can be started on the two gabled end frames, using 2in. by 1in. material. For each frame, two uprights 4ft. high, and a top and bottom rail 3ft. 6ins. long, are needed. These are assembled into a rectangular framework

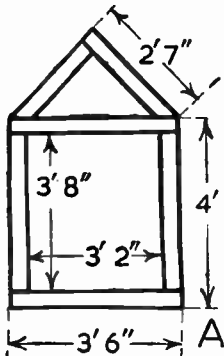


When complete, all four frames are taken to the site, and, after the ground has been levelled, the main carcase is assembled by fixing the end frames on to the long sides. This

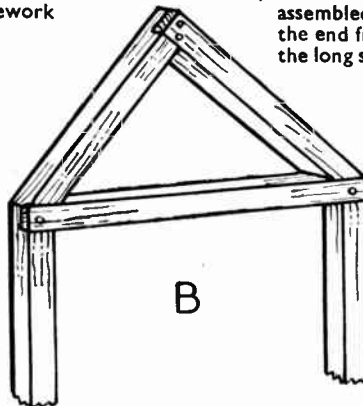
upright from the shed to a distance equivalent to the thickness of the weatherboarding being used; the fillet should have a bearing surface of 1in. on the frame.

Pieces of weatherboarding are then cut to length and nailed into position, working from the bottom upwards. On

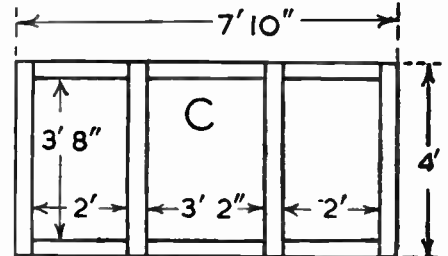
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Dimensions of end frameworks



Fitting the gable on the top rail



Dimensions of side frames

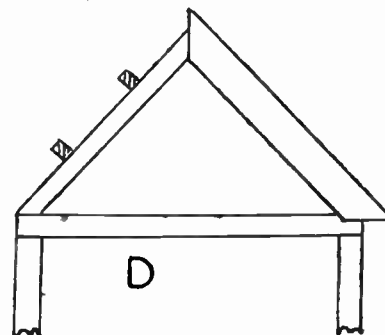
by halved joints at the corners. Then the gables are prepared. On each frame, two 2ft. 7in. lengths are halved together at one end, while the free ends are sawn across at the appropriate angle so that they bed down correctly on the top rail.

Drawing (A) shows the main dimensions of one of the end frameworks, while (B) shows the fitting of the actual gable on the top rail.

The long side frames measure 7ft. 10ins. long by 4ft. high, and are of 2in. by 1in. stock. Halved joints are used on the corners of the frameworks as before, but the frames are made more rigid by two intermediate uprights half-lapped into place between the top and bottom rails. Drawing (C) gives the dimensions of one of these frames.

can be done either by screwing or by nailing, but it is essential that all frames be truly vertical when erected.

The two long sides and back of the garage can then be weatherboarded to make the structure more rigid. To do this, a small fillet should be nailed to each of the upright members of the back end frame. Each of these fillets should project beyond the



Dealing with the roof



The door

To protect your seeds you need AN EFFICIENT BIRD SCARER

THE greatest menace to the gardener with freshly sown seeds are the mischievous birds who delight in pecking and scratching away at the neat rows. They can do a great amount of damage unless something is done to try to scare them away. Many devices have been tried out, from the simple rows of black cotton to complicated alarm systems including scarecrows with a varying degree of frightfulness.

The scarer described here has been a great success where it has been tried. It is quite simple to make from odd pieces of material, and has the advantage that it can be easily moved to a new site when required.

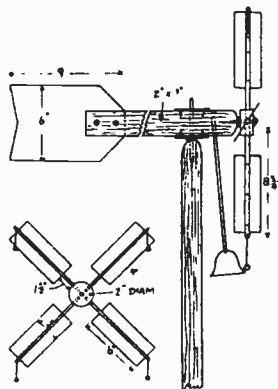
Reference to the sketch will show that the rotating vanes of the windmill each have a small weight attached to the end by a piece of cord. These in turn strike the bell, and scare the birds away not only by the noise but also by their action.

Not Too Large

It is best not to make this windmill too large, otherwise it will want more than a puff of wind to work it. The sizes given will make a useful model for all general purposes, but several smaller ones could be placed at strategic positions in the garden.

The windmill vanes are made first and mounted on to a circular block of wood 2ins. diameter and 1in. thick. A hardwood toy wheel will do very well for this, but the centre hole must not be too large. Drill four holes about $\frac{3}{4}$ in. deep around the edge to fit $\frac{1}{4}$ in. dowel rod $8\frac{1}{2}$ ins. long. With a fine saw, cut down the centre of each rod to a distance of $6\frac{1}{2}$ ins. and insert the vanes, which are made of sheet metal. An old cocoa tin or something similar will provide enough

sheet for each vane. Cut open, hammer out flat, and cut 6ins. long and 3ins. wide. Then fix into the dowel rod slots. Three rivets will be sufficient to hold them tight, drilling small holes before inserting the rivets. Also drill a small hole in the end of each rod to which to fasten the cord and weight. Small lead balls, or, better still, the little bells used on children's reins, would be suitable, leaving them suspended on 2ins. or 3ins. of cord or string.



Details of the scarer

Now, firmly glue the four rods into the centre, making sure that they are all placed at the same angle—say, about 35 degrees. It does not matter in which direction they slope; one way making the windmill turn in a clockwise manner, and the other way the reverse.

The wood bar on which the windmill turns is 18ins. long, 2ins. wide and 1in. thick. Round off the nose part and drill a small hole for the 3in. round head bearing screw for the vanes, making sure

that it is drilled true and centrally.

Cut a thin slot in the opposite end about 4ins. down for the tail fin. A piece of tinplate 9ins. long and 6ins. wide cut to the shape shown is bolted into the slot. When screwing the vanes into position, place a washer on either side of the centre boss.

A length of $\frac{1}{4}$ in. dowel rod is next fitted into the underside of the bar near to the nose. Drill a hole slightly on the slant just behind the front screw. The exact amount of slant will be determined by the size of the bell and also the distance of the weights or bells on the tips. Measure up carefully before fixing this. The bell, which can be an old alarm clock bell or a cycle bell as large as you can get, is screwed into the end of the dowel rod with a wood screw. Cut the rod too long to begin with and shorten it until it is at the correct striking distance from the weights.

Pivot The Bar

In order that the windmill will swing round to face the wind, the bar must be pivoted at its centre of balance. Place the bar on a thin edge, such as a rule, and move it along until it balances, then drill a hole to take the pivot. This can be a piece of steel rod about $\frac{1}{4}$ in. diameter.

A small metal plate is now fitted on either side of the wood bar to form bearings, and can be quite small brass pieces fastened with wood screws. The holes should just fit the pivots while the wood centre hole can be enlarged.

The post holding the windmill should not be too tall—just sufficient to catch enough wind to turn it. With the exception of pivots and holes, which can have a dab of grease, the whole job should receive two coats of good oil paint. (203)

Motor-Cycle Garage—(Continued from page 437)

the end frame the weatherboarding fits between the rebates made by the two fillets, but on the long side each plank butts against the projecting fillet and passes along the side to the front frame. At the front, the weatherboarding stops short at $\frac{1}{2}$ in. from the front edge of the frame, and a small fillet of wood is then nailed on to the upright of each front frame. This fillet covers the end-grain of the side weatherboarding, and fits flush with the front face of the frame.

The gable end at the front of the garage can be similarly boarded, but here the bottom edge of the bottom plank comes slightly below the top edge of the top rail.

Two roof 'purlins' are nailed across the gables on each side, being spaced an equal distance apart. These purlins are of 2in. by 1in. section set on edge, and project 5ins. beyond each end frame. The roofing boards can then be nailed into place, these being about 2ft. 11ins. in length. The nails are driven into the

purlins, and when all boards have been fixed, the roof can be covered with roofing felt. The felt should be laid in horizontal strips, the upper strips overlapping the lower.

Two narrow battens are planed to the appropriate angle along one edge, and are then fastened along the ridge, one on each side of the gable. Similar strips are put down the slope of the roof, level with its outside edges, and it is also advisable to nail a strip over any horizontal joint in the roofing felt.

To cover the end-grain of the purlins, 'barge-boards' are fitted over them at each end. These boards meet in a mitre angle on the apex of the gable, while the lower edges are cut off parallel with the horizontal rails of the frame.

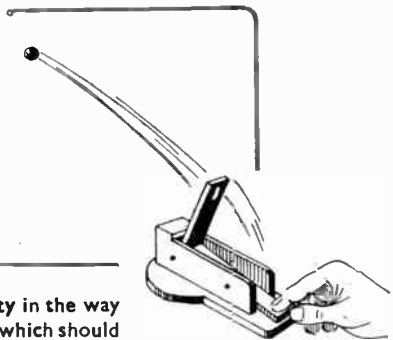
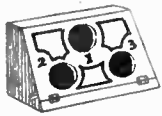
All this construction is made clear from drawing (D) the left-hand side of which shows the purlins while the right-hand side shows the barge-boards.

Although a single door can be fitted if

desired, it will be found more satisfactory to have double doors. These doors are of the very simplest construction. Each measures 3ft. 8ins. high by 1ft. 7ins. wide, and they are hinged to the inside edges of the front frame uprights. Each door consists of lengths of grooved and tongued boarding to make up the required width, the boarding being nailed on to three inside rails. A horizontal rail is placed near top and bottom edges of the door, while the third rail fits diagonally between them (see drawing E). When hinging these doors into place it should be done so that the top edges of the diagonal braces are on the meeting edges of the doors.

This completes the actual construction, for it is unnecessary to provide a floor or to line the inside. It is advisable to fix a hasp, staple and bolts, while the whole garage should be given two good coats of creosote. (117)

The children—and their elders—will enjoy this NOVELTY BALL GAME



HERE is a novelty in the way of table games which should catch on and afford much amusement to the younger people. It can be easily made up by the handyman with a few tools, a fretsaw, nails and screws.

The game consists of shooting a number of small wooden balls into the holes of a specially made box. The novelty lies in the mechanism of the 'thrower' which is so designed that skill and judgment must be exercised when throwing the balls to guide them into the openings of the box. The whole idea can be got by a glance at the picture of the finished article on this page. Here we see the box with three separate divisions inside the box. A little decoration of simple panelling carried out in colour would add greatly to the attractiveness of the lid. The other parts of the box need only be plain in character. The lid, it will be noted, lies at a convenient slope to suit the throw of the balls, the box itself makes a useful storage place for all the parts of the game.

box, two in number, are placed centrally each way, and they should be glued and nailed securely to the ends and floor of the box. Plane the front edge of the horizontal partition in a similar manner to the floor and top. To get the true size of the lid, take the measurements direct from the box so far made and allow for cleaning up. At a distance of about 1½ ins. up from the

2 ins. respectively. Between these pieces fit and glue the shaped ends which will be 7½ ins. long by 4 ins. at the widest part. When the ends are fixed and the glue has hardened, plane away the front edge of the floor and top to the same angle as the ends, making all smooth and even for the door to rest accurately. The inside partitions of the

The Thrower

An admirable idea of this is got from the sketch, and from the view of the finished thing in Fig. 2. There is a base piece (A) of which a plan is given in Fig. 3, with all necessary measurements for drawing out the outline on the wood.

The dotted lines shown on the plan give the position of the side uprights (B), which measure 4 ins. by 1 in. On one of these sides must be carefully plotted the exact position of the two pivot-screw holes, and in Fig. 2 the measurements for these are given. First bore the holes in one side piece and then lay this on the second side in true position as a guide for running the holes through the second side. Glue the sides to the base in the positions given and then mark out and cut the small piece (C) which is intended to bind the two sides together and also to form a stop for the lever (E) when this is thrown upwards. The piece (C) measures 1½ ins. by ¾ in.

The Spring Board

The foregoing parts then form the frame as it were for containing the two moving levers (D) and (E). In order to throw the balls in the right direction towards the target, the spring board (E) will be pivoted a little above its lower end, and a diagram of this piece is included in Fig. 4 with all dimensions given. A hole is cut at the top end of the piece in which the ball will rest. This hole is bevelled round afterwards and glasspapered smooth. The lever (E) is thrown upwards by the lever (D) coming in contact with it just above its pivot. The movement can be seen from the sectional view Fig. 5. When the lever (D) is depressed with the forefinger, this lever being pivoted, its opposite end is raised and makes contact with lever (E). The force of the throw and, of course, the length of the throw, too, is regulated by the touch of the finger, and it is this power of touch which, through practice, enables the player to throw the balls skillfully into their holes. Some care must be taken in boring the holes in the side edges of the levers (D) and (E) to get them all exactly opposite and squarely run in. The holes in the sides of the frame must be large enough for the pivot screws to

(Continued at foot of page 442)

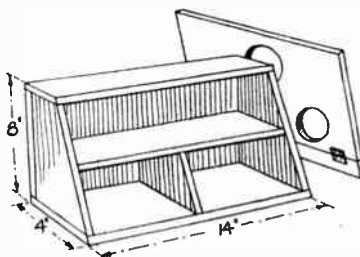


Fig. 1—Construction of the box

lower edge of the lid rule a line right across and cut through with the fretsaw. These two pieces are afterwards hinged together either by a pair of plain brass hinges or by two pieces, or even a single long length, of tape glued firmly to lap on each section of the door and its rail. Next cut the three holes in the lid after describing the

circles to suit the position of the partitions in the box. Cut round with the fretsaw and then clean round the cut edges with coarse and fine glasspaper. The lower lid rail is screwed and glued to the box, and the sharp edges of the wood cleaned off and made smooth to handle. A view of the lid before fixing is shown in Fig. 1.

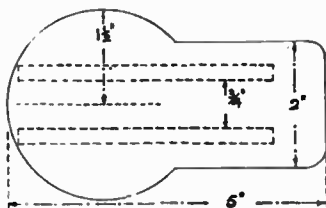


Fig. 3—Plan of the thrower

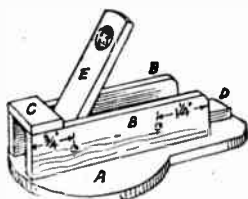


Fig. 2—The thrower

The Box

Commence work by making the box, the construction of which is easily understood from Fig. 1.

Wood ½ in. thick would be suitable for all parts, and the method of cutting the pieces and their measurements as well as the arrangement of putting them together are all shown in the diagram. First set out the back of the box. This will measure 14 ins. by 7½ ins. To this glue and nail the floor and the top, measuring 14 ins. by 4 ins. and 14 ins. by

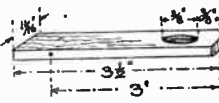


Fig. 4—The spring board

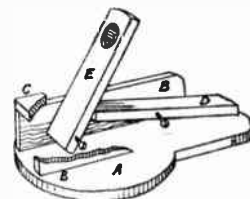
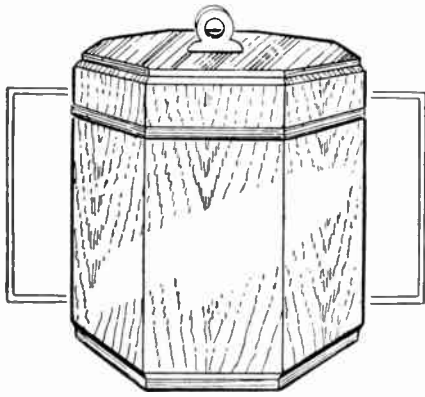


Fig. 5—Details of the movement

You can make this useful FLOUR BARREL



THIS is a useful article for the kitchen, and a rather uncommon article of woodwork for the carpenter to make; a change from the more conventional style of work. It has a rather novel appearance, not unpleasing, and needs no great amount of wood to construct. For the wood, it is suggested that fretwood, $\frac{1}{2}$ in. thick be employed for the top and base, with $\frac{3}{8}$ in. deal for the staves, etc. A spare end of matchboarding would supply the small quantity of deal required, and if it has to be bought, perhaps a local timber merchant may be able to find one or two short ends for the purpose.

Marking The Shape

The shape is octagonal, as shown in the illustration, and this can be marked out direct to the wood. For the lid, and base, cut two squares of the fretwood, 7 ins. each way, and centre with diagonal lines. With a radius of corner to centre, as shown at (A) in Fig. 1, strike the arcs, and draw lines, as shown in the diagram, where these arcs contact the sides of the square. One octagon being cut, the edges should be lightly glass-papered smooth, then it can be laid upon the second square and a pencil run round it, to mark its shape and save setting out the octagon again.

From deal, $\frac{3}{8}$ in. or $\frac{1}{2}$ in. thick, mark out another octagon, this time on $6\frac{1}{2}$ in. squares. Two of these will be required, one for the actual bottom of the barrel, and the other for fixing under the lid to form a rim. At (B) a pattern for the staves is given, eight being required. Cut to dimensions given, and near the top saw and chisel out a $\frac{1}{2}$ in. wide groove, $\frac{1}{8}$ in. deep. Use a gauge for marking these, as the grooves must be in true alignment all round.

The staves must be bevelled on their meeting edges to an angle of $67\frac{1}{2}$ degrees, so that they meet closely together when assembled. To better ensure this, it is a

good plan to prepare two wedges to the angle of $22\frac{1}{2}$ degrees, and nail these to the shooting board, the staves being held upon them while their edges are planed. The width of the staves is rather full, to allow for any inequality in the lengths of the sides of the octagon.

Fitting The Staves

The staves, after planing, should be fitted, one at a time, as at (C) Fig. 2 to the smaller octagon, and partly nailed. Fit each stave very carefully, and when all are so fitted, tie a cord round the groove, slip a piece of wood behind the cord and tighten, as shown in Fig. 3. These should be a close fit all round. All being satisfactory, remove the staves, glue them, and refix. Do this job quickly, and be sure each stave is refixed to its own particular side. All being on, without losing any time replace cord and twist tight, then leave for a few hours for the glue to set hard. A small nail can be driven in the groove, under which the stick can be held to prevent it untwisting and loosening the retaining cord.

Now, with a small plane or file, bevel the top and bottom of the barrel, thinning the ends of the staves to just $\frac{1}{8}$ in. Finish smooth with glasspaper. Take one of the fretwood octagons for the base of the barrel. From the centre of this cut out a $2\frac{1}{2}$ in. diameter circle. This can afterwards be used for making

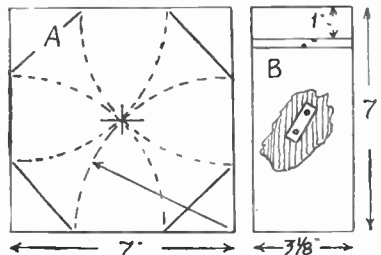


Fig. 1—Dimensions of the base and staves

the handle; then glue and nail the octagon to the bottom of the barrel. It should just cover it, as in detail (D) in Fig. 2.

In the groove, drill two small holes, about $\frac{1}{2}$ in. apart. These are indicated by dots in (B). On the inside cut out a groove, $\frac{3}{8}$ in. deep, connecting these holes, as shown in the inset in (B). You will now need a small coil of thin brass or copper wire, such as you can buy at

most hardware shops for a few pence. Thread one end of the wire in the lower hole and plug it, to prevent it shifting out, with a small nail. Wind the wire tightly in the groove until full, cut off, and push the end in the second hole. Remove the nail, and twist the two ends of the wire. Cut off short, and tap the ends into the groove on the inside. Fill the groove with sealing wax or hard stopping. So much for the body of the barrel, now for the lid.

A Handle

For a handle, a wood or metal knob can be fitted, but failing that a handle can be cut to the shape shown at (E) Fig. 2, from the circle of fretwood cut from the base. Take the second octagonal, the fretwood one, and in its centre cut out a mortise slot to fit tightly the tenon at the foot of the handle. Now glue the deal octagon to the underside of the fretwood one, and glue the handle in. This completes the work.

The inside of the barrel, and underside of the lid should be left plain. All the rest should be well glasspapered, and then can be stained light oak and varnished or enamelled white, as pre-

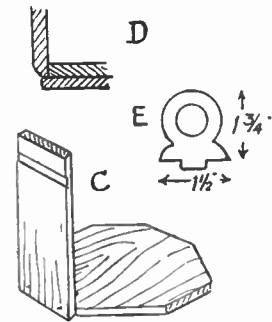


Fig. 2—Constructional details

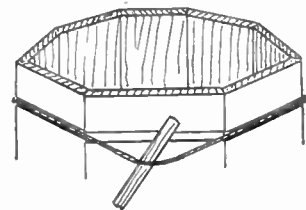


Fig. 3—Holding the staves after gluing

ferred. In fact the whole could be left in the plain wood, but it soon soils, and some finish is to be preferred.

No cutting list is really needed for this article. For the fretwood, a 7 in. by 14 in. panel will suffice. For the remainder about 5 ft. to 6 ft. of matchboarding will be needed, $\frac{3}{8}$ in. thick, or a lesser quantity if the wood is wider than matchboarding usually is. Any odd piece of deal, of suitable thickness can be used for making the deal octagons. (100)

**Our Advertisement pages are always
worth your careful attention**

An angler tells you HOW TO CATCH TROUT

THE trout fishing season opened in March on many rivers and brooks, but it is not until April that trout fishing becomes general. From this month until the end of September, when the season closes, the trout affords some of the finest sport with rod and line desirable. Those of my readers who can obtain access to a trout water, and go the right way to work may be assured of plenty of good fun trying to catch the wary speckled fishes. The best trout rivers are found in Devon, Somerset, Wales, Derbyshire, Lake District, the Yorkshire dales, Northumberland, and in most parts of Scotland.

It is necessary to take out a licence for fishing in England and Wales, and in many places it is also necessary to seek permission or to pay a moderate fee for a ticket or permit. There are some small streams where trout-fishing is free, but they are not many. It is, therefore, important to see that you have complied with all the preliminaries before you cast a line over a trout water.

The Outfit

There are various methods of fishing for trout. Briefly, fly-fishing, bait-fishing, bottom fishing, dapping, and spinning. The two methods most likely to attract the beginner are the two foremost, that is, with fly on fly-tackle, and bait—worms, grubs, caterpillars, etc.—on ordinary float tackle, or without a float.

Suppose we take fly-fishing first. This art is not half so difficult to acquire as many folk think. You need the right kind of tackle, and then plenty of practice at the start to enable you to throw an artificial lure with ease and accuracy.

Outfit required: Light split-cane or greenheart fly-rod, 9ft. 6ins. to 10ft. 6ins., with a check reel, aluminium or gun-metal, 2½ins. to 3ins. diameter; level or tapered dressed silk line 40yds. long; and a short length of backing line, which is wound on the reel first, the proper line being attached to it. You will, of course, secure the backing line to the reel before winding on.

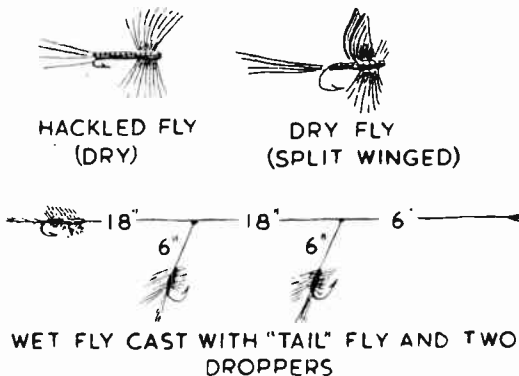
Also needed are half-a-dozen casts of silkworm gut or Nylon, or such synthetic material as Monoflow, Luron, or other gut substitute, either 2yds. or 3yds. long, and a small selection of artificial flies. Many old hands have fly-boxes bang full of all sorts of patterns, often accumulated over long years and some hardly ever used. Do not aspire to this fly collecting, but content yourself with a few proved serviceable lures and pin

your faith to skill and hard fishing, rather than to constant changing of flies. A lot of time can be wasted if you get into the habit of changing your fly every few minutes, just because you do not get a trout straight away. Put on a likely fly, and persevere with it; when, after a patient trial, nothing happens, try another one; but give any likely fly a fair trial.

For 'wet' fly fishing—i.e. casting your lure into the likely spots where trout usually feed, allowing it to sink a little below the surface (under some conditions it may be advisable to let the lure sink fairly deep), and working it with slight jerks of the rod-top as it floats downstream towards you. Do not have too much line out, at first—you can do your fancy casting when more experienced. It is wise to get some practice before you go to the river or beck to fish, by going on to a meadow or on the lawn, or other suitable spot, and casting your fly at some object placed at a little distance—a saucer or a tin lid will do. Mark this, and endeavour to get your fly to alight on it, or as near to it as possible. When you have acquired the knack of it and can manage the job without tangling yourself up in the line at every throw, you may go to the scene of action with confidence.

The Best Method

The method of 'wet-fly' fishing is the



best for a start. You can use just one fly at the end of your cast, but many anglers also attach two more flies at distances of about 18ins. between, to the cast, employing short lengths of gut—known as 'points'—to attach them. These should be about 6ins. in length. You get a better chance of picking up a fish if using two or three lures rather than one only.

As to flies for this sunken method, you cannot do better than stock your fly-box (a fair-sized tobacco tin will serve for carrying your wares) with the following half-dozen: Black Spider; March Brown, hackled pattern; Red Palmer; Iron-blue

Dun; Orange Partridge; Greenwell's Glory.

You can add the Blue Upright (especially if fishing Devon and Somerset or Cornwall waters) and the Alder, Coch-y-bondhu, and Wickham's Fancy.

Where the 'wet' fly succeeds most is on the smaller and faster-flowing waters. The quick runs, the tails of pools, sharp, tumbling waters which widen and shallow across a pebbly section, then swing right or left, deepening, under the near or the off bank—all these places should be well tried out, for trout often lurk in such spots.

A Fine Art

'Dry' fly-fishing is really something of a fine art, which you can aspire to as you develop into the skilled craftsman. In this method only one fly is used, and this is anointed with a drop or two of liquid paraffin on a small brush, which is carried in a small bottle in your waistcoat pocket ready. The fly is cast at any rising fish you may see, and is allowed to float quietly down to where the 'rise' has been noted. Your object must be to try to fish so that there is no unnatural drag at the fly by the current; it should come down over or just past the feeding fish quite naturally. A swirl in the water will generally denote that a fish has sucked in the lure—do not snatch; take things easily, and with a twist of your wrist get the hook home in his jaw. It is necessary to watch, as the lure floats downstream, that there is no slack line; therefore, you gather the slack up with your left hand as it comes towards you.

Useful 'dry' flies include Black Gnat, Blue Dun, Olive Dun, Greenwell, Coachman, May-fly, Red Spinner, Wickham, Sedge, etc.

With Baits

Trout-fishing is successful on most streams if you are permitted to use baits, but on some waters 'fly only' is the rule. However, there are hundreds of brooks and stretches of rivers where it is in order to fish with worms (red and brandling) dock grubs, wasp grubs (in season), beetles, larvae, maggots, and so on.

You require no special tackle. A light cane rod and the same tackle as you would use for dace, perch, and chub, with a suitable float, and a 1yd. gut or Nylon cast mounted with a No. 10 crystal hook, the line being the usual silk undressed, greased, about 30yds. long, on a free-running reel, will serve you very well.

A method known as 'swimming the worm' is practised a lot in summer on North-country streams. In this style the worm is cast upstream like you would throw a fly. Practice is needed, as with other forms of angling. (108)

There'll be plenty of amusement with 'TUMBLING THOMAS'

THIS amusing toy is in the form of a tank-like hollow box containing a rolling weight. When placed at the head of a slight slope, it rolls down, head-over-heels fashion. A comic cat is painted on the outside and this gives the toy its name. If, for any reason, the reader does not fancy a cat, it is quite easy to substitute, say, a clown figure. Better—make several tumblers and decorate them all differently.

Planning The Sides

The first thing to do is to plan out the oval sides. It is, perhaps, best to make a thin card pattern. First draw a horizontal line A-B (Fig. 1) and then a vertical one C-D, crossing at X. From X, either side, mark off points E and F. These are both $1\frac{1}{2}$ ins. from the centre. Mark off, also X-G $1\frac{1}{2}$ ins. Stick pins or thin nails in points E-F-G. (They are actually upright. In the illustration they are shown diagrammatically). Tie a piece of cotton round E-F-G and see that the knot does not slip. Now take out the pin at G and slip the point of a pencil in the loop. Draw the pencil round, straining at the loop and a perfect oval will result. The chain-dotted lines in the lower half of Fig. 1 show this stage.

(Incidentally, most readers will know this method of obtaining an oval with a loop of cotton, but not so many will know how to produce an oval of any desired dimensions without any guesswork or tedious trial and error with the locating of the pins. Yet it is very simple. If X-H is half the major axis and X-G half the minor axis, space off X-H with the compasses, then, keeping this distance, place the point at G, and mark off E and F with the pencil end).

Having obtained the pencilled oval on thin card, cut it out so that it can be used as a template for marking off the wooden pieces. These can be about $\frac{3}{8}$ in. thick, and preferably of solid wood, not ply. Soft wood is best, as pins have to be driven in. Cut out two pieces thus with a fretsaw. Place them together with a couple of nails half-driven in to hold them together, temporarily, and with a wood file, etc. get them both alike.

Now take a long strip of cardboard, quite thin, and a fraction over $2\frac{1}{2}$ ins. wide. Fasten one end to the two wooden shapes as shown in Fig. 2, carry it right round, and continue winding it round, applying thin glue, and securing at the sides with very small panel pins or shoe-

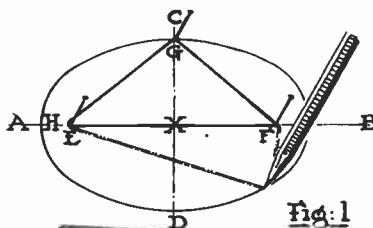


Fig. 1

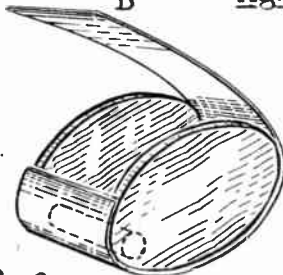
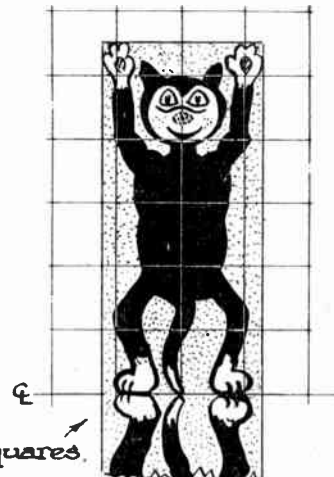


Fig. 2

One-inch squares

Fig. 3



repairers' rivets. Do not worry overmuch about neatness at this stage, as this card will be covered afterwards. The card should overlap the sides very slightly so that afterwards the whole job can be rubbed against a sheet of glass-paper and made perfectly flat.

Several thicknesses of card should be applied, so that one has a substantial job, not likely to be wrecked as soon as applied with.

The All-important Weight

Before closing the interior, however, the all-important weight must be added. This is a piece of iron rod, a trifle smaller than the width of the box and about $\frac{1}{8}$ in. diameter. If too heavy the toy will be a little beyond young hands. If the weight is insufficient the toy will act very sluggishly. A simple test will show what to use. Large ball-bearings can also be used but not, for example, iron nuts. The weight must roll smoothly.

The cat design is now applied. This is drawn on a slip of paper and pasted on. Fig. 3 shows a suggested design, marked off in 1 in. squares for enlarging. Note that only half the pattern is shown with a bit to show how the other half is merely a repeat, upside down, of the first part. If several models are to be made, all alike, duplicates of the pattern can either be traced off by means of carbon paper, etc. or even by means of a hectograph.

Except by a fluke, it is unlikely that

the length of the pattern, as given, will exactly tally with the length round the reader's model, but it can easily be extended by increasing the length of the fore-paws (or reduced in a similar way). Allow 1 in. or so of plain paper at one end for lapping.

Before pasting the pattern on, it is best to decorate the sides. If one has a paint sprayer, this can be a very easy matter. First paint, freehand, with oil paints or enamels, circles slightly larger in size than pennies, halfpennies and farthings. Place the circles at random. When these are dry, place appropriate coins over them and spray with a darker paint (the first circles should be in light, bright colours). When the coins are tipped off, perfect circles of colour will be seen on a dark ground.

But for those who work with a simple paint-brush, other methods will suggest themselves.

Now paste on the cat pattern, and colour it. Poster colours will suffice. The cat, of course, is black with a pink nose and paw pads and green eyes. The background (shown stippled in Fig. 3) is light green. When thoroughly dry, the job is varnished with clear picture varnish. This is most essential as otherwise the toy will soon get very dirty and the paint will rub off.

It is hardly necessary to point out that one does not have to be a skilled artist to prepare the design. The more odd the cat looks, the more fun is the toy.

(102)

Novelty Ball Game—(Continued from page 439)

move about freely, but the screws must be properly screwed into the levers. In the diagram Fig. 5, the near side (B) is shown mostly cut away so that the pivot screws may be seen in relation to the levers, etc. Note that the levers must work freely between the two

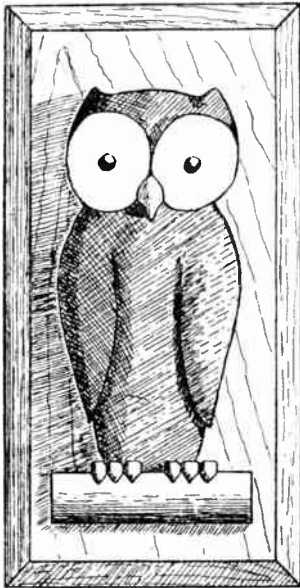
sides (B), and they should be glass-papered down to work freely and accurately.

The balls should preferably be of wood and $\frac{3}{8}$ in. diameter, ordinary marbles would do but not quite so well. All parts of the thrower may be coated

with varnish or, of course, could be painted the same colours as the box.

Proper scoring as a game could be adopted when playing. Six balls or more may be used, and score totalled up by opening the box front and noting the number of balls in each division.

Please your visitors by fitting AN OWL DOOR KNOCKER



THE plainest front door can be made attractive by an unusual knocker. This friendly little owl will please you and your visitors quite as much as the fancy brass ones sold in many of our holiday resorts. It has, moreover, the unusual feature of being made of wood.

The only wood needed is a piece of $\frac{1}{4}$ in. or $\frac{1}{2}$ in. board 7 ins. by 3 ins. on which to mount the owl; 3 ins. of $\frac{1}{4}$ in. dowel; and a 6 in. length of $2\frac{1}{2}$ ins. by 2 ins. stuff from which to cut the owl.

Shaping the Bird

The making of the owl is simplified by carefully pencilling inch squares on the wood, as shown in Figs. 1 and 2, and then using these to draw the bird. If saw-cuts are now made in the directions of the dotted lines the rough block will be ready for carving.

With a sharp penknife pare off the wood until the back and side outlines are reached. Do not hurry over the carving at any stage and remove small chips only (about the size of pencil parings).

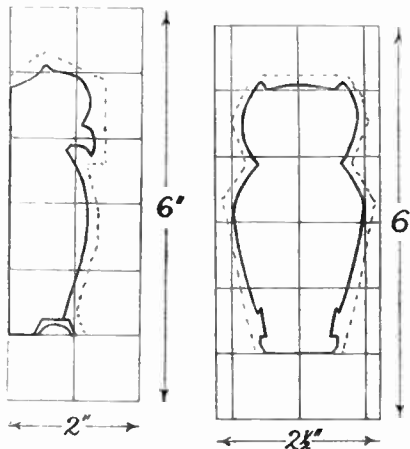
Next, rasp and file out the hollow beneath the feet to house the dowel rod. Test by placing the dowel in position now and again until a flush fit is obtained. Leave the detail of the claws until the rest of the owl is completed. Now round off the body with your penknife, and make grooves below the inside edges of the wings to bring them into relief.

The eye surrounds are flat and, as will be apparent from the sketches, swept back at an angle from the beak. Pare away slowly, taking especial care near the beak. The eyes may be made of brown or black glass beads fixed in small

sockets with waterproof cement, or round-headed copper rivets may be fixed in carefully drilled holes. If copper rivets are used, give them a dab of black high gloss enamel before you varnish the whole job later.

The Beak

To shape the beak, re-sharpen your penknife on the oilstone and take off tiny shavings. Do not be tempted to use a razor blade, as these, owing to their width, are difficult to control in small work such as this. Should you have the misfortune to spoil the beak, make another in scrap wood (preferably hardwood) and cement it into a recess made between the eyes. (Such a recess may be made by drilling holes and cleaning out a slot).



Figs. 1 and 2—How to mark out the owl

Finally, remove the wood from between the feet. A fine fretsaw will help here; saw towards the body, taking care not to mark it. A small chisel will now clean out the surplus. Carefully point the claws, then, holding the dowel in position to give support, cut the shallow grooves to indicate the toes.

The dowel should now be cut to its correct length, i.e., $2\frac{1}{2}$ ins. and glass-papered at both ends. As shown in Figs. 3 and 4, it is fixed firmly by two long thin countersunk screws. Such firm fixing is necessary because the dowel will be the part automatically held when knocking. The hinge (brass) may be let into the owl's head or merely screwed on direct.

The striker, as Fig. 3 indicates, is a roundheaded screw passed through a washer.

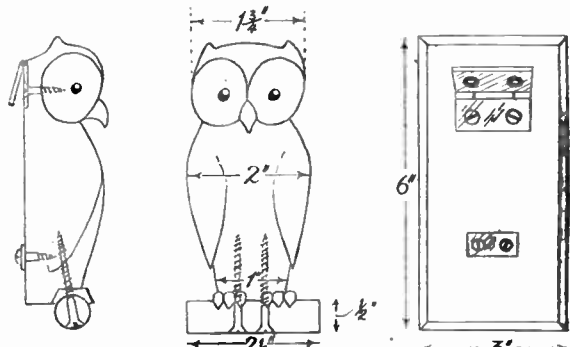
The back board, Fig. 5, is cut 3 ins. by 6 ins. and either chamfered or rounded at the edges. The hinge can be recessed or just screwed on as upon the owl's head. A small piece of brass serves for the striker plate, and is best recessed, so as not to throw the bottom of the owl forward too much.

Fixing the Back Board

This back board is fixed to the door by the same screws which fix hinge and striker plate. Hence screws long enough to pass right through the board must be used. This device neatens the whole job by keeping the fixing screws out of sight behind the owl.

In finishing the knocker, its rustic appearance is enhanced by staining all parts of the owl brown—except the eye surrounds and beak—with a solution of potassium permanganate or other stain, and then varnishing the whole bird and back board. A saturated solution of orange shellac in methylated spirit gives a good grounding and an ordinary clear varnish tops it up well. Finished thus, the knocker has a delightful warm gold tone and throws up the owl well. (395)

**Designs are given
free with every
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Figs. 3 and 4—Side and front views of the knocker, showing the positions of hinge, striker and screws

Fig. 5—Hinge and striker plate on back plate

For the 'tyro' come these TIMELY CAMPING HINTS

WITH the approach of warmer weather, many of us will be thinking of the pleasures of a holiday spent under canvas. For those contemplating their first camping venture, these hints should prove useful.

For camping, of course, the tent is the chief item of equipment. Probably you have one that has served well for some few seasons, but, as a result of standing up to all kinds of weather, dust and rain, is a trifle shabby. White tents show up the dirt worse than coloured ones.

Is it possible to wash a dirty tent? Yes, it can be done, but it is seldom worth all the trouble—it will soon get soiled again. Why not dye it, perhaps, a green or khaki colour? Then you will not have to worry so much about its becoming unsightly again. By the way, it is a good idea to dye the tent a shade darker than you really desire to have it, because it will soon fade out, and so give you the tint you prefer. Any good dye made for colouring cotton materials should serve.

Tent Proofing

Perhaps that old tent, though in a pretty fair condition, needs re-proofing. There are several really good makes of waterproofing solutions now on the market, and these are easily applied with a suitable soft brush, if you spread out the tent on a flat surface.

In case you prefer to make your own solution, the following recipe is given:—
Boil 1oz. isinglass in 1pt. of soft water until dissolved; strain through clean linen into a second saucepan. Dissolve 1oz. white Castile soap in 1pt. of water, strain, and add to first solution. Dissolve 1oz. alum in 2pts. of water, strain; add. Stir and heat the combined solution until it simmers. Spread out the tent on a flat surface, and work mixture into fabric, particularly the seams, with soft brush.

You can hire tents, but it is better to get your own, if you intend to go camping regularly. For a small party, a useful type is the 'gypsy' tent. The roof of this pattern slants down on either side until it is 2ft. from the ground, then falls straight. It will house two. A fly-sheet is recommended with this model.

For three or four, a good ridge tent of the 'cottage' type will serve. Its height is 6ft. 6ins., walls 3ft., length about 7ft. and width 6ft. 6ins. or 7ft. The cost is £10 to £12.

For a family party, a square type 'bell' tent about 10ft. square and 11ft. high, with 3ft. to 6ft. walls, is serviceable, as it provides plenty of head-room.

For the solo camper, the 'Itisa' pattern has the advantages of being light, and also easy and simple to erect. It has one pole and one guy-line only. Dimensions

are about 7ft. 6ins. wide, and 5ft. high. Whilst primarily intended for 'solo' camping, it will accommodate two chums at a pinch. Another useful type of small tent is the bivouac pattern.

Cooking

One of the most popular cooking stoves are the air pressure paraffin stoves which are made in several sizes. For hikers, cyclists and 'solo' campers generally, a pocket outfit is useful and easily carried. For permanent camping, a portable gas stove or large oil stove is recommended.

If using a pressure paraffin stove outdoors, it is advisable to have a draught shield, or you will have to build some sort of shelter for it. You will require a can for oil, and a smaller one for spirit (methylated).

Groundsheets and Bedding

Rubber groundsheet are the best, but rather more expensive than canvas or oilskin. But if sleeping 'on the turf', a really good waterproof groundsheet is most essential.

Campers need two blankets each—and warm, woolly ones are best. Sleeping-bags, kapok filled, beat everything for comfort and warmth, but are somewhat expensive. If you prefer luxury in camp, you can be comfy sleeping on an air bed. In a more or less permanent camp (summer) a low metal-framed camp bed, or the same thing in wood, is worth consideration.

The best fun for young fellows, however, is the simple, inexpensive sort of camping. One may have to 'rough it', and very often may have to improvise,

but that makes it all the more exciting. The complete outfit with no frills is as under.

For two persons:—

Bivouac tent; fly-sheet; groundsheet; blankets; small pressure stove; fry-pan; meta fuel (for stove); plates; two small saucepans; two mugs (unbreakable); tea infuser; knife, fork, spoon, each; jack-knife with tin opener; toilet requisites; small shoe brush; tooth-brush; two small towels; small first-aid compact; pyjamas and spare socks; a cape or lightweight macintosh. And, of course, pull-up bags for food, tea and so on.

The two chums divide the equipment equally between them, and whether they go on foot or on bicycles, they will be in for a good time—if they plan wisely.

Sites

Camping sites vary—from farm fields with no services for campers, to commercial camping grounds, fully equipped. Those who join the Camping Club (38 Grosvenor Gardens, London, S.W.1), get many facilities for camping, on sites scattered up and down the countryside, as well as other advantages. Whatever you do, never trespass on private ground. When in doubt, ask the local policeman or other reliable person in the nearest village. Farmers often give permission, or make a small charge per night.

No matter where you camp, always conform to the rules, written and unwritten; and never give farmers and landowners or other countryfolk cause to regret your presence. Good manners cost nothing. (209)

A Model Town

ONCE saw a working model electric town; the cars actually ran by themselves, and stopped at traffic lights. The lights in the shops and houses could be lit when desired, as well as street lamps. Could you tell me if this or something similar could be made by the ordinary man, and if so, give me details? (K.D.—Northolt Park).

VARIOUS methods of obtaining the effect mentioned, are sometimes employed. In one, the complete town is built upon a hollow base, thin plywood or similar material being used where roads are to be (the latter usually forming a continuous circuit). The vehicles are of light construction, and have a piece of soft iron low down near the front. An upright belt of canvas or similar material runs under the base, being guided on wheels so that it follows the circuit the vehicles are to travel. Magnets are fitted in pockets sewn to this belt, their poles coming directly under the base. The whole is driven

through reduction gearing from a motor which also actuates any automatic switching necessary for bulbs used in the model. The vehicles follow the magnets, which can be made to halt as required, by an automatic out-of-gear mechanism also worked by the motor.

Amplifying a Piano

IS it possible to amplify my piano on the lines of the electric organ or guitar, etc.? (B.R.L.—Newport).

THE only practical method would appear to be to use an ordinary microphone of good quality, near the piano, and to feed the output from this into an amplifier, which would drive suitable loudspeakers. If for use in a dance hall or some similar purpose, then a very powerful amplifier will be required, if the volume is to exceed that already provided by the piano itself. A 5-watt amplifier would be the minimum feasible, 12 to 15 watts output would be better, and a small Public Address amplifier would be suitable.

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(Continued foot of page 446)

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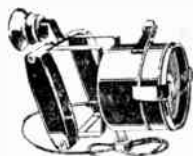
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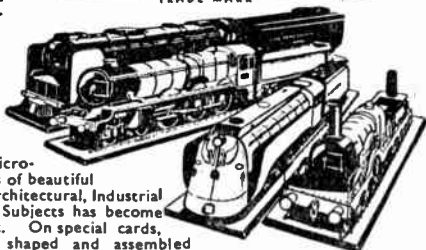
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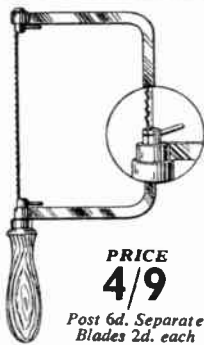
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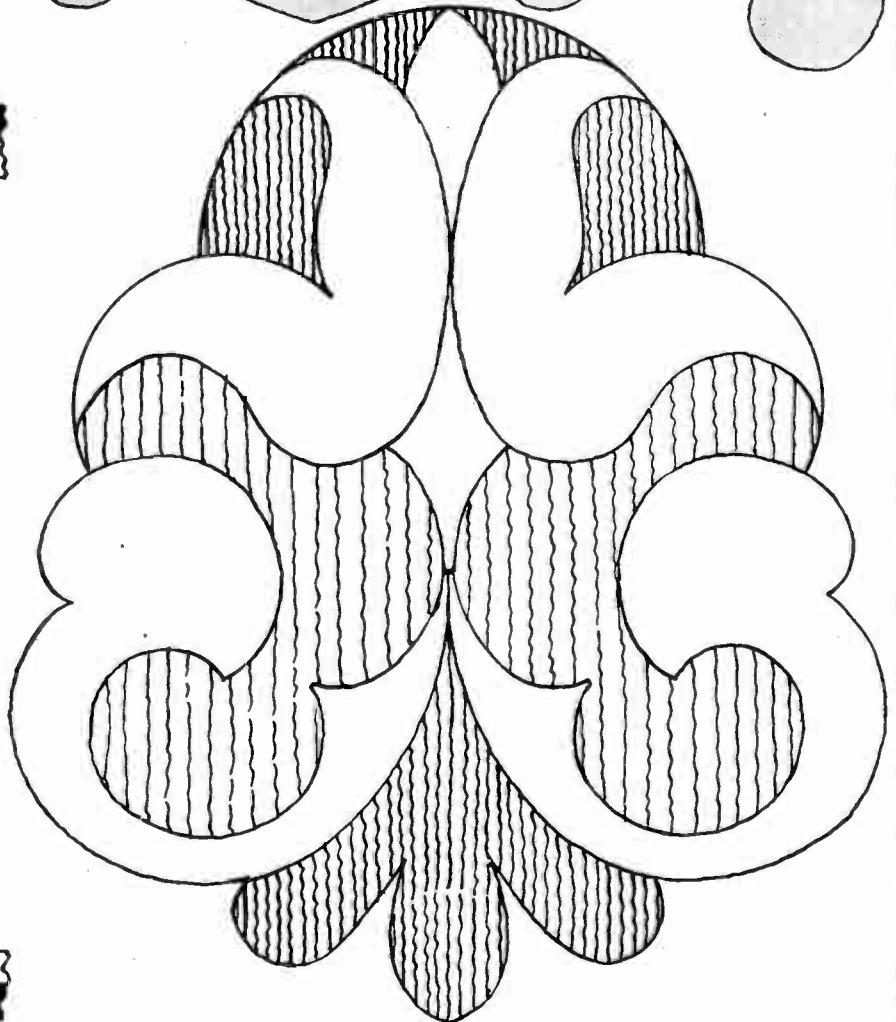
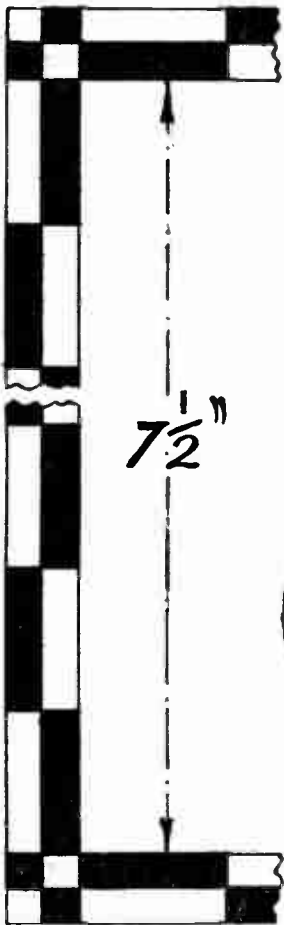
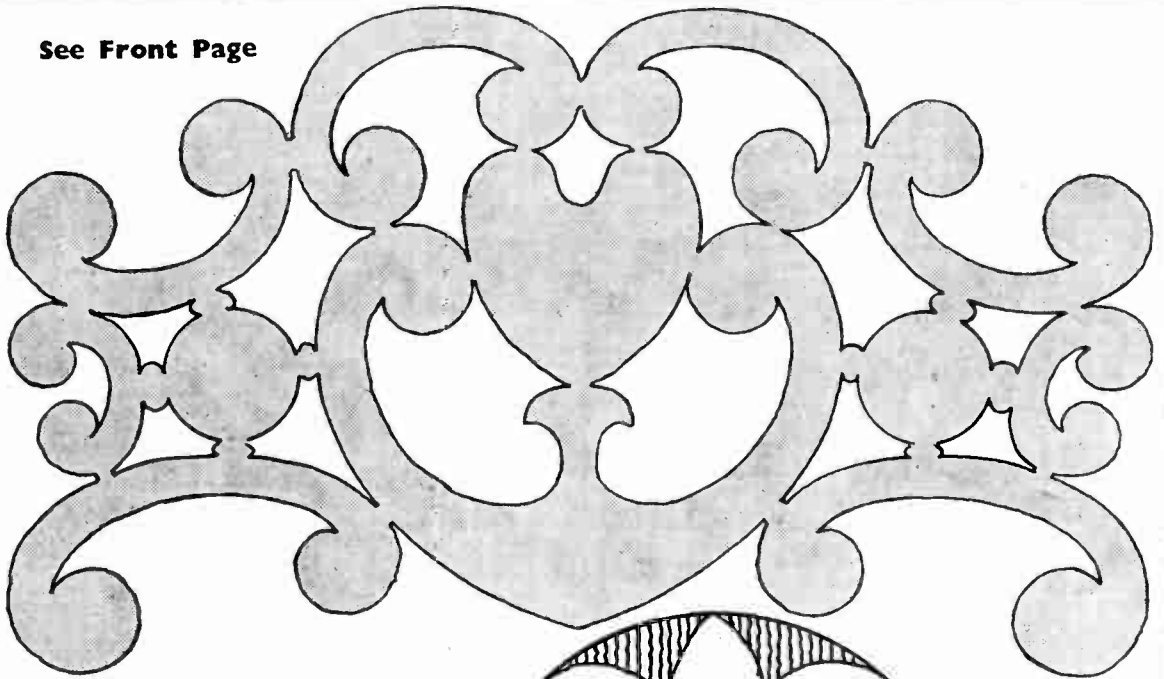
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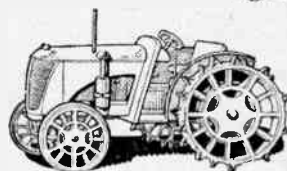
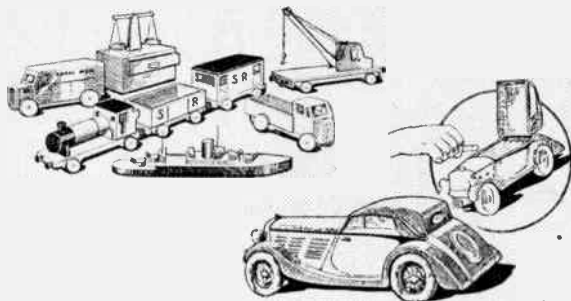
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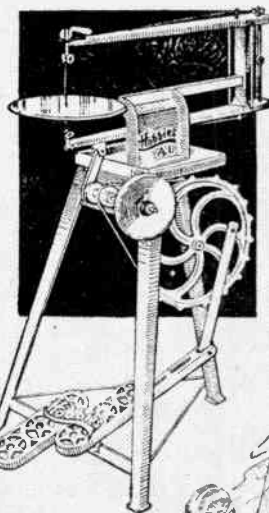
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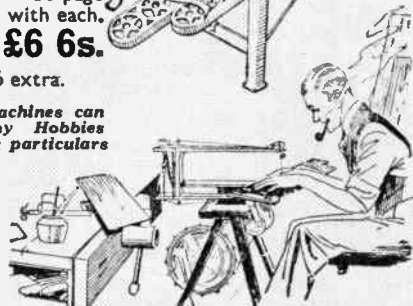
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Hobbies

WEEKLY

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DESIGN SHEET FOR A
DOLL'S HIGH CHAIR

April 18th, 1951

Price Fourpence

Vol. 112 No. 2894

Have fun with this

MARBLE ALLEY

THE marble alley shown in Fig. 1 is quite an interesting novelty and is well worth making. The article is simple to make, and the construction is such that it can be made quickly since all jointing is done with glue.

A brief description of the game is given with the aid of Fig. 2. The alley, in

the form of a house front with two doors marked 5 and 10, is placed on the end of a long table. The marble is shot at one of the doors billiards fashion, and if you are lucky in getting the marble in the doorway, the window shutter above will drop and a funny face appears.

There are a number of ways of scoring to make up a game. For instance you can make a game of 105 up, each player having, say, three shots a time, and the first player to reach 105 being the winner.

How To Commence

Commence making the article by cutting the front indicated in (A) Fig. 3, and a piece of sound $\frac{3}{8}$ in. three-ply is used. Take care to cut the door openings in the position marked, and also the two window openings. The two window shutters are cut from plywood, and these are cut to just fit the openings and are fixed in position with a small hinge as shown in Fig. 1.

Two sides are required and details of these are given in (B) Fig. 3. Cut the sides from $\frac{3}{8}$ in. ply to the size and shape indicated, and take care to drill the $\frac{1}{4}$ in. hole in the position given. A piece of $\frac{3}{8}$ in. ply is cut to size indicated in (C) Fig. 3, which forms the back of the alley.

In order to glue the parts together to form a good joint, corner pieces are required, and

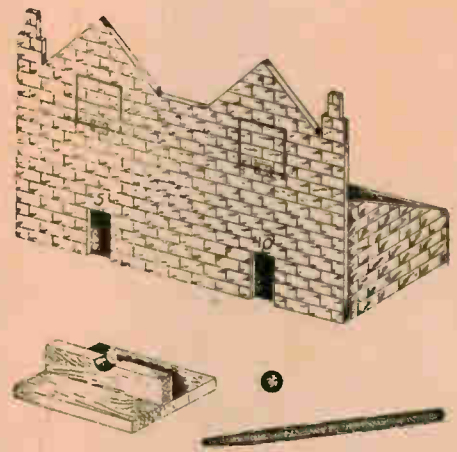


Fig. 1 - The completed alley

these are shown in (D) Fig. 3. Two pieces of $\frac{1}{4}$ in. by $\frac{1}{4}$ in. stripwood are required 5ins. long and two 2ins. long as indicated.

The Faces

Before fixing the parts so far cut, it is best to get along with the faces for the windows and details are given in Fig. 4. First cut two pieces of $\frac{3}{8}$ in. plywood to size 7 $\frac{1}{2}$ ins. long by 2 ins. wide, and divide the 2 in. square portion at the top into $\frac{1}{4}$ in. squares as indicated in (E) and (F) Fig. 4. It is now a simple matter to draw and cut the shape of the heads. The eyes, nose, and mouth, should be marked in coloured enamel on each face, which gives a very nice effect when the game is in action.

The two figures pivot on a length of $\frac{1}{4}$ in. dowel rod, so four small eye hooks as indicated are required through which the dowel will pass with ease. Screw the hooks into the back of the figures as shown in view (G) Fig. 4, the positions being clearly marked in (E) and (F).

Now cut two pieces of plywood 2ins. by 2ins. as indicated in (H) Fig. 4, and glue them on the front of the figures

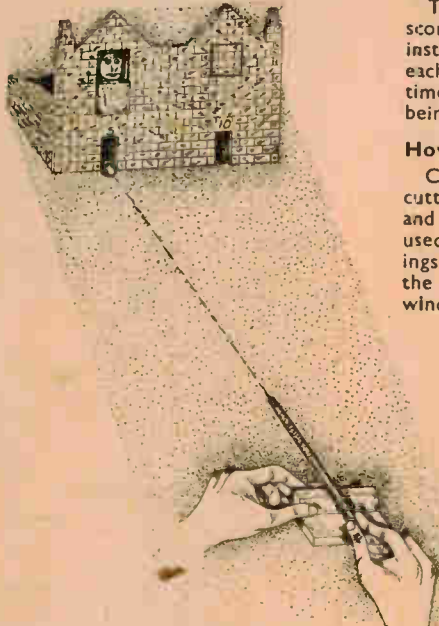


Fig. 2 - The game in play

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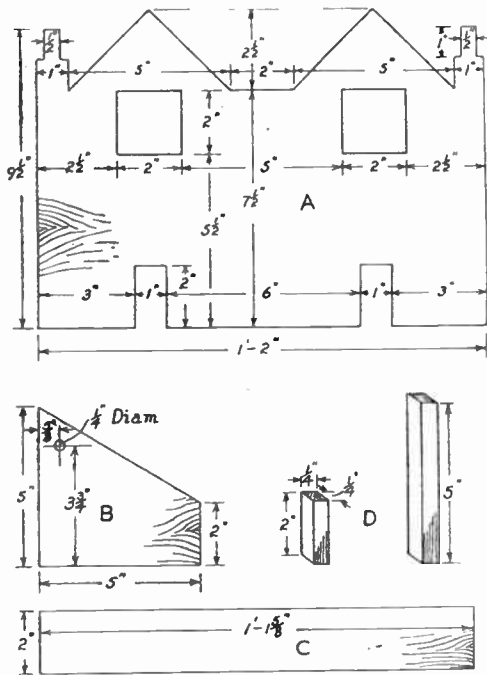


Fig. 3—Details of front, back and sides

at the bottom as indicated at (X) view (G). A piece of $\frac{1}{4}$ in. dowel rod 1ft. 2ins. long completes the alley, and the whole can then be fixed together.

Glue the two pieces of strip-wood (D) on the back face of the front $\frac{3}{16}$ in. from the side edges, and glue the 2in. lengths on the inner face of the sides $\frac{3}{16}$ in. from the back edge. The front, sides and back are now fixed with glue, and a glance at Fig. 5 shows clearly the parts in position. The length of $\frac{1}{4}$ in. dowel is next slipped in position with the two face figures in place, and the rod is secured with a little glue applied at each end.

The alley looks quite attractive if

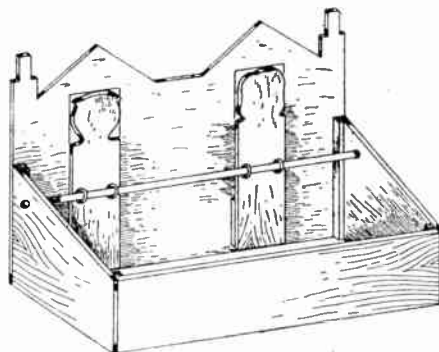


Fig. 5—Back view

finished off by applying a covering of doll's house brick paper.

One other item remains to be made,

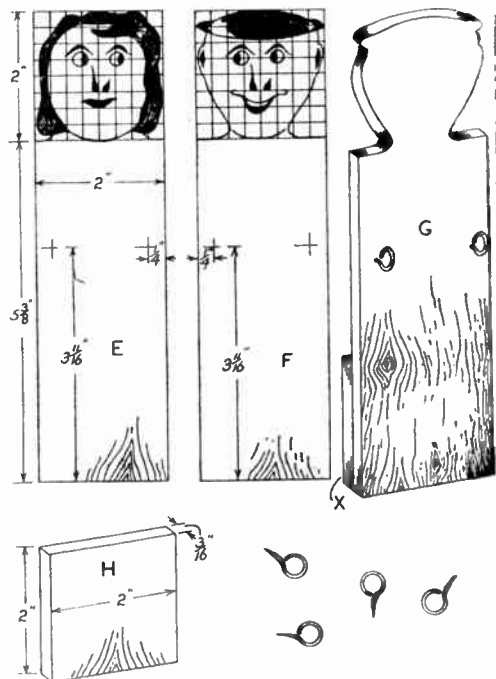


Fig. 4—The faces for the alley

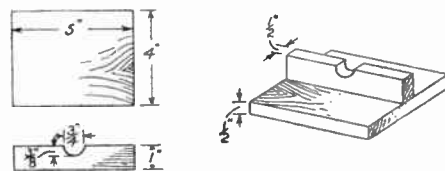


Fig. 6—Cue guide

the cue guide indicated in Fig. 6.

The cue consists of a $\frac{5}{8}$ in. dowel rod about 9ins. long and the end is slightly tapered. For the cue guide cut a piece of wood 5ins. by 4ins. by $\frac{1}{2}$ in. and a piece 5ins. by 1in. by $\frac{1}{2}$ in. Cut the curve, as indicated, in the latter piece, and then glue it on the base as shown in Fig. 6. (109)

Skittle Game—(Continued from page 5)

Cut a length of the cord for each skittle, make a knot in one end, and press the cord into the groove of the plug, gluing the latter in the hole of each skittle so that the cord comes out at the centre of the base. Fig. 8 shows how the

Then knot the cords together, and finally tie them to the eye in the end of the sliding rod. When the skittles are knocked down, a pull of the handle will bring them all back into an upright position at once.

skittles being of some bright colour.

The skittles should work fairly stiffly so that they stand rigid and do not fall over until knocked down by the swinging ball.

The game will make great fun, and the

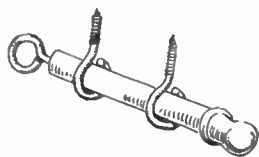


Fig. 6—The arrangement of the handle

cord is inserted in the plug.

Now thread the cords through the holes in the base-top and draw them together until the skittles stand upright.

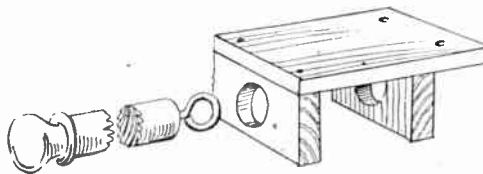


Fig. 7—Alternative scheme for housing the handle

The base could have an underboard of plywood, perhaps, nailed on to the sides, but this is not wholly necessary. All the wood parts could be painted, the

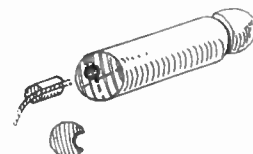
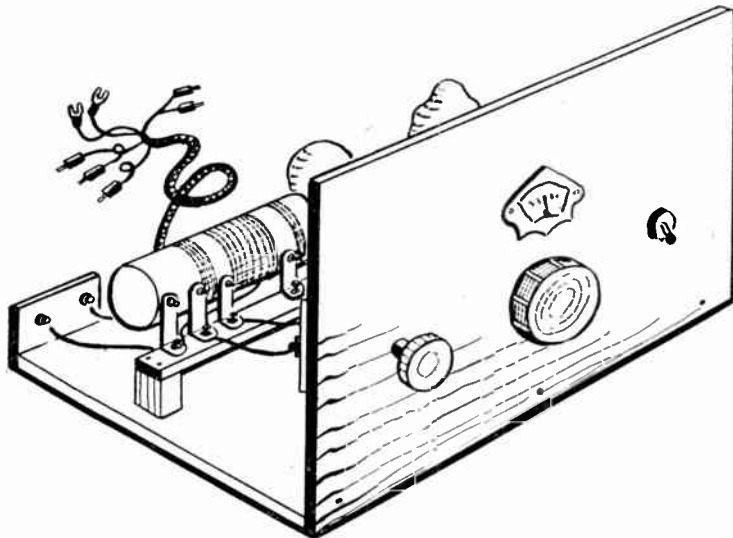


Fig. 8—Inserting the cord into the skittles

players will in time find the best angle and speed at which to let the ball go in order to knock over the greatest number of the skittles.

You should have no difficulty building A SHORT WAVE TWO



THIS set is designed to tune the short wave bands, and by a simple coil-changing arrangement the wavelengths tuned can be extended without limit. The set can, in fact, be used on the usual long and medium waves, if desired, and it can give excellent results on these. On short waves a considerable number of stations can be received and many American and European transmitters can be picked up at ample speaker volume. With headphones, the range is increased, and is literally world-wide. Notes on obtaining best reception will be found later.

Circuit Details

The circuit is shown in Fig. 1, and uses a tetrode or pentode such as the 220HPT for output, for maximum amplification. The detector is a valve such as the HL2, or its equivalent, and coupling is by means of the .01 mfd. condenser to avoid the unpleasant howling which can so easily arise in short wave sets as reaction is advanced.

The coupling transformer should be of

1:3 or 1:5 ratio, and may be of the 'parafeed' or direct-coupling type, according to what is available. The .005 mfd. condenser reduces treble and background noise. An aerial coupling winding is used to obtain good selectivity of tuning.

The Coil Holder

This is shown in Fig. 2 and is made

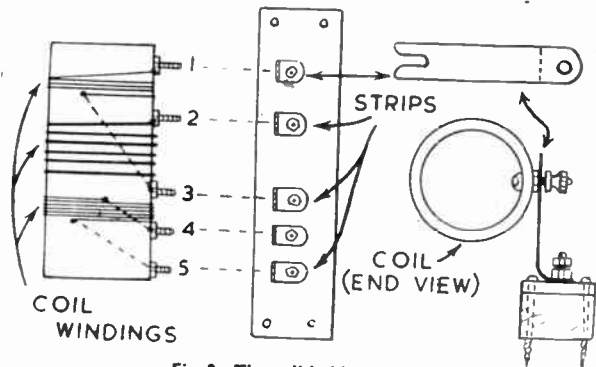


Fig. 2—The coil holds

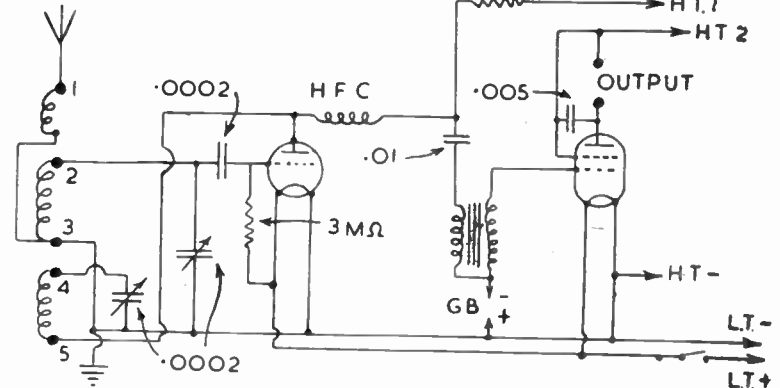


Fig. 1—The circuit

in diameter are used, the number of turns for various wavebands, between terminals 2 and 3, will be as follows.

- 5 turns of 18 S.W.G. wire, 10 to 25 metres.
- 8 turns of 18 S.W.G. wire, 15 to 35 metres.
- 12 turns of 18 S.W.G. wire, 19 to 40 metres.
- 18 turns of 22 S.W.G. wire, 29 to 70 metres.
- 28 turns of 24 S.W.G. wire, 42 to 100 metres.

In each case the turns are spaced one from the other

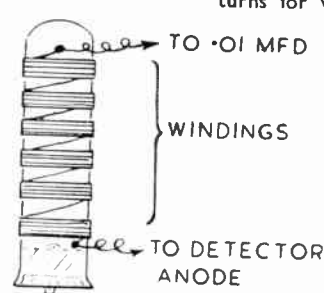


Fig. 3—The H.F. choke

by about the diameter of the wire used. The aerial coupling winding, between points 1 and 3, will consist of one-third the number of turns on the centre winding, and be $\frac{1}{2}$ in. from it. The reaction winding, between terminals 4 and 5, will consist of two-thirds the number of turns on the centre winding, and also be $\frac{1}{2}$ in. from it, except with the smallest coil, which should have 5 turns $\frac{1}{2}$ in. away, or reaction will be weak. The 24 S.W.G. wire can be used for all aerial and

Both 3 megohm and 50,000 ohm resistors can be $\frac{1}{2}$ or 1 watt types. The .0002 mfd. condenser is best of mica, this having improved insulating properties.

Wiring up is accomplished with 18 or 20 S.W.G. tinned-copper wire, insulating sleeving being slipped over the leads where necessary. Flex is used for battery leads. All the connections to the coil holder, detector valveholder, and variable condensers should be as short

in English. Tuning will be easiest on the higher wavelengths.

Below 15 metres reception depends largely on conditions, and tuning is increasingly sharp. Other stations are congregated on 13, 17 and 19 metres, with a further Amateur Transmitter waveband near 10 metres.

Lower wavebands may be tuned by reducing the number of turns between points 2 and 3, and this will be necessary if tubes of larger diameter than that mentioned have been employed. With smaller tubes, a few more turns will be required.

Reaction Efficiency

Smooth reaction is essential for long distance results, and the voltage applied to H.T.1 may need adjusting to achieve this. If the reaction windings have too many turns, or are too near the centre windings, reaction will be fierce. When properly adjusted, volume should slowly increase, as the reaction condenser is closed, until a point of maximum sensitivity is reached, after which, if the condenser is further closed, the set will commence to oscillate. Accordingly, the reaction control is manipulated with the left hand, while tuning is in progress. Provided this is remembered, and the tuning knob is operated slowly, many scores of stations will be received.

If the reaction condenser is not kept in the position giving maximum sensitivity, as explained, only the more powerful stations will be heard, and these will be at reduced volume.

Final Points

A 120 volt H.T. battery is best, though a 90 volt battery can be used. The grid bias voltage should be adjusted for best results, about 3 to 6 volts being normal. A 2 volt accumulator is used for low tension.

High resistance headphones can be used for long-distance listening, though closer stations will operate a speaker well. The latter should have the usual matching transformer for battery-type pentode output valve, and should be mounted in a cabinet. If desired, a two-way switch could be fitted to connect either phones or speaker at will. (207)

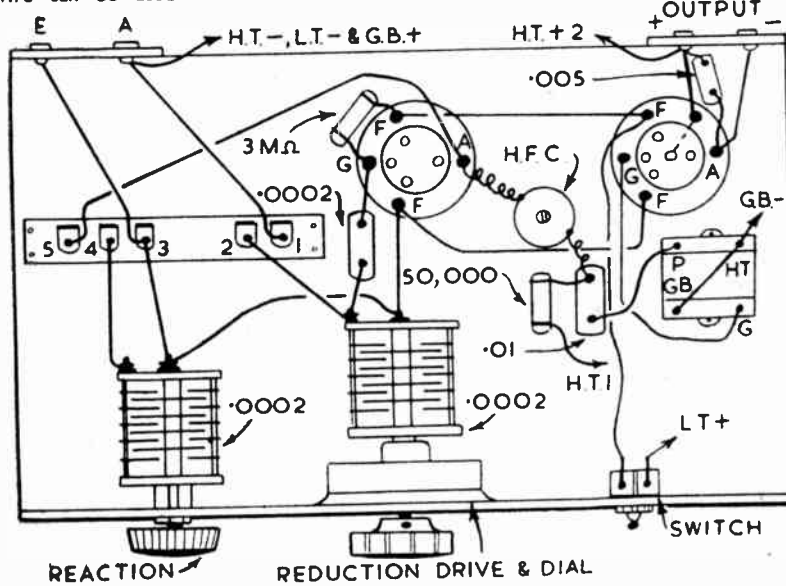


Fig. 4—How the parts are placed on the base-board

reaction windings, and the turns of these are not spaced.

Take the ends to the various terminals, carrying them through small holes and inside, where necessary, as indicated. If the readily-obtainable transparent adhesive tape is bound tightly over the windings this will prevent the turns moving.

The H.F. Choke

This is wound on a glass tube about $\frac{1}{2}$ in. in diameter and 3ins. long, which is afterwards placed on a cork screwed to the baseboard. It has six windings, each of about 50 turns, with a space of about $\frac{1}{2}$ in. between each. Any thin wire, such as 36 to 42 S.W.G., either enamelled or silk-covered, can be used. All turns are in the same direction, and the endings are secured by means of tape or sealing-wax.

Wiring Up

The parts are placed as shown in Fig. 4, and screwed down. A baseboard 10ins. by 6ins. is used, and a panel, cut from 3-ply, of similar size. The base should be $\frac{1}{2}$ in. thick to facilitate screwing panel and small rear terminal or socket strips to its edges.

Both the .0002 mfd. variable condensers are of the low-loss air-spaced type, and that used for tuning must have a reduction drive—the better this is, the easier will tuning become. As tuning is sharp, operation without a reduction drive is scarcely practicable.

and direct as possible, if very low wavelengths are to be reached satisfactorily.

Tuning Notes

To begin with, the coil covering 19 to 40 metres will prove most suitable. During morning, afternoon, and early evening many stations will be heard congregated between approximately 19 and 20 metres, with the 'Amateur' band near 21 metres active at weekends. Towards afternoon and evening the 25 metre band will provide many stations, as will the 31 metre band. The 40 metre Amateur band will also be found lively. Towards late evening, the higher wavebands will become increasingly used and a coil with more turns can be placed in position.

Short wave reception conditions change from hour to hour, and also according to season. A little experience will show which bands are most lively at any particular time, and many stations will be heard announcing their schedules

DOLL'S HIGH CHAIR

Material for making the Doll's High Chair from this week's free design (No. 2894) is obtainable from our Branches for 5/6, including tax, or direct from Hobbies Ltd., Dereham, Norfolk for 6/4 post free.



A few odds and ends make this self-righting SKITTLE GAME

SKITTLES is a jolly game for playing out of doors, as well as a table game indoors. It is a game, too, which can easily be made by oneself from a few odd pieces of wood and round rod.

The essential part is the square board or base upon which are stood the skittles while in play. The board may be about 18ins. square, and it may take the form of a hollow box as shown in our sketch of the finished thing in Fig. 1, and again in detail in Fig. 2. The depth of the box should be from 2½ins. to 3ins., and it may be raised slightly more if desired by adding four corner feet of squared wood about ¾in. thick.

Simple Mechanism

Within this hollow base is contained the simple mechanism which brings the skittles upright and into play again after they have been knocked down. More of this, however, later.

Looking again at Fig. 2, we see that the four side rails of the base are placed flush with the top board, and that the rails are lock-jointed at their ends to make a strong angle joint which may be nailed with fine wire nails and glue. After the rails have been framed together and checked for squareness, the top may be screwed or nailed on, but not before the position of the ¼in. holes for the cords of the skittles have been carefully marked out and bored. In Fig. 3 is shown a plan giving the standard measurements of such a board and the holes.

The actual skittles may be bought ready turned, but it will be of much more interest to make them oneself from thick round rod, or even a hardwood

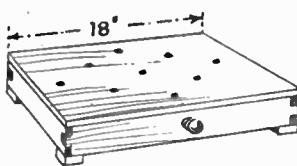


Fig. 2—The base assembly

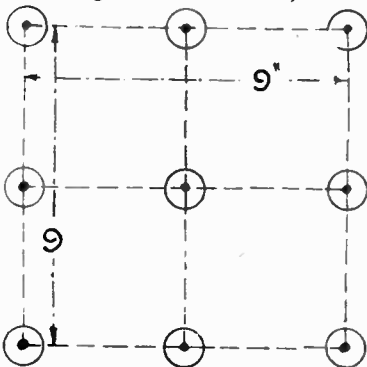


Fig. 3—Plan showing positions of skittles and holes

broomstick. Be sure to trim the base of the nine pieces square so that they stand firmly upright, and, for the sake of appearance, round off their tops neatly and clean up with coarse and fine glass-paper.

For the corner pole, to which is attached the cord and the ball, a length of stout round rod can again be used. This pole must be made to slip into sockets formed in the base. A hole should be bored in the top of the base to just take the diameter of the pole, and then a square of, say, ½in. wood should be glued and nailed in the lower angle of the frame. This square of wood should also have a hole bored in it, the same diameter as that in the top of the base. When the pole is threaded into both upper and lower holes, it should stand firmly and perfectly erect.

An Easy Swing

To facilitate an even and easy swing of the ball, a strip of metal about 1in. long, ¾in. wide should be cut and rounded off at each end, and drilled with two holes. The strip is then attached to the top of the pole by a round-head screw, a glass bead being first put between the pole head and the metal strip, just as seen in the enlarged detail in Fig. 4. The cord should be knotted and passed through the outer hole in the strip and down to the wood ball, the length of cord being judged later on after the skittles have been fixed.

For those who are going to make the mechanical arrangement for raising the skittles, the sectional diagram (Fig. 5) should prove useful. With this arrangement all the skittles can be stood upright simultaneously by a pull of the knob at the front of the base. In this diagram is shown the placing of the cords on three of the skittles only, the ends of the cords being fastened to a handle. All nine skittles are, of course, connected up in a like manner.

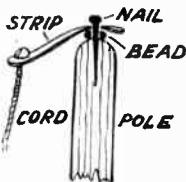


Fig. 4—Details of the revolving top

To form the handle for pulling out, first fix a knob to a length of round rod,

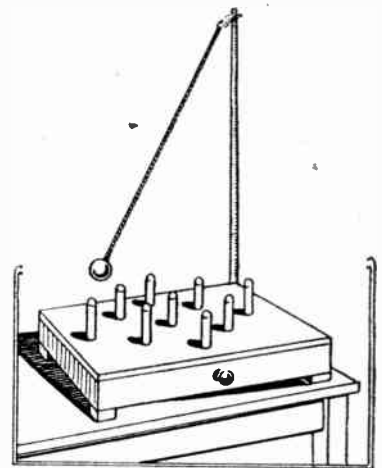


Fig. 1—The completed game

about 3ins. to 4ins. long, and made to slide in a hole bored in the front rail of the base and a couple of screw eyes driven in the underside of the top of the base (see Fig. 6). Or a neater and stronger method would be to bore the hole in the front rail of the base and then glue and screw a block of wood (having a similar hole in it) a short distance from the front rail. This idea is clearly shown in Fig. 7.

At the inner end of the sliding rod put a screw eye to take the ends of the cords which join up with the skittles.

The Pulleys

Next, purchase nine small iron or bakelite pulleys and screw each one underneath the base top and just against each hole. Now take each skittle one by one and mark the centre of each by cross lines on the bottom. Now bore a hole ¾in. wide and about ¾in. deep in each, but not exactly in the centre. It should be a little to one side, so the edge of the hole just touches the centre mark, as in the detail Fig. 8.

Now cut a round plug for each skittle from a piece of ¾in. rod, and cut or file a groove along the side of each into which a piece of whipcord can lie and be glued. The plugs should be a ¼in. shorter than the depth of the holes.

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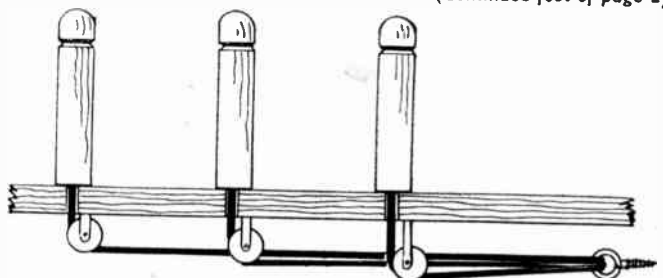


Fig. 5—Sectional diagram of mechanical raising arrangement

How to make a high speed SOLENOID MOTOR

THIS motor will run at quite a high speed from a small battery and in some ways it rather resembles a single cylinder steam engine. As the flywheel and crank spin round the plunger goes in and out, being worked electrically.

Figs. 1 and 2 give a good idea of the arrangement of the various parts and also help to show how the motor works. The solenoid is a type of electric magnet which tries to draw the core in when current flows. The current to this solenoid has to travel through the crank to the end opposite the flywheel. This end is bent slightly and touches a contact screwed to the base of the motor. By arranging this contact in the right position matters are so arranged that during one half revolution of the crank the core is drawn into the solenoid, but for the other half revolution electrical contact is broken, and the momentum of the flywheel withdraws the core. This is repeated with each revolution so that the motor continues to run as long as the battery is connected.

The Flywheel

This can be made from plywood, metal, or cardboard. If the latter is used, about three thicknesses of stout material should be employed. These pieces can be

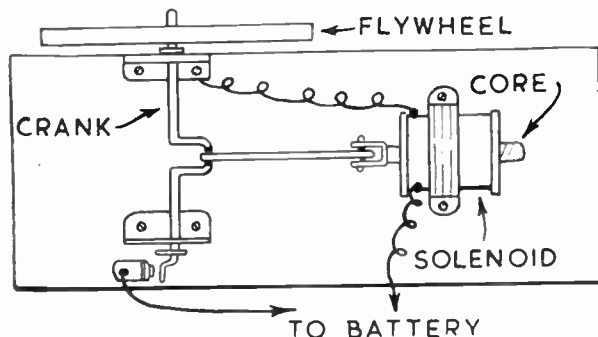


Fig. 1 - Plan showing arrangement of parts

cut out as shown at (E) in Fig. 3, which is also possible if plywood is used. If a small hole is made in the exact centre the flywheel can be glued to the end of the crankshaft.

Alternatively, some kinds of tin lids can be used, as they stand, or cut to the shape shown. Here, the wheel will need to be soldered to the end of the shaft.

The crankshaft itself is made by bending a thick piece of wire with pliers. The crank section should have a throw so arranged that the core moves about 1 in. to 1½ ins. as the wheel is turned. The small bend which touches the contact should only be about ¼ in. out of line with the crank spindle because a big movement is not wanted here.

The Other Parts

The crank turns in two brackets which can be made from tin to the size shown at (B) in Fig. 3. Holes are made where shown and the pieces are bent at the dotted lines. The brackets are screwed to the wooden baseboard.

Part (D) is the connecting link, also cut from tin and about ¼ in. wide. Part (C) is the solenoid core, about which more is given later. (F) is the contact, also cut from thin tin or brass, and arranged to touch the little bend on the axle during about one half-revolution.

(G) shows one of the solenoid cheeks. Two should be cut from thick cardboard.

Making the Solenoid

The core (C) in

the core, and a piece cut from a large nail or small bolt is suitable. A diameter of about ¼ in. or so is best. Any roughness should be removed with a file or glasspaper or the engine will not run at full speed.

The solenoid tube is about 1 in. long and the two cheeks (G) in Fig. 3 are securely glued to the ends. The bobbin thus formed is wound full with 22 or 24 S.W.G. wire (cotton-covered wire is best, but enamelled wire can be used if care is taken not to scrape away the insulation when winding). Leave the ends a few inches long and bind a strip of stout paper round the solenoid.

Final Details

The solenoid is held in position by a long strap of tin, cut, bent to shape and screwed down. A block of wood is used as shown. The connecting link is pivoted to the end of the piston core. The easiest method to do this (given suitable tools) is to cut a slot in the end of the core and drill a small hole for a pivot pin. Or the small piece shown at (A) in Fig. 3 may be cut and bent into a

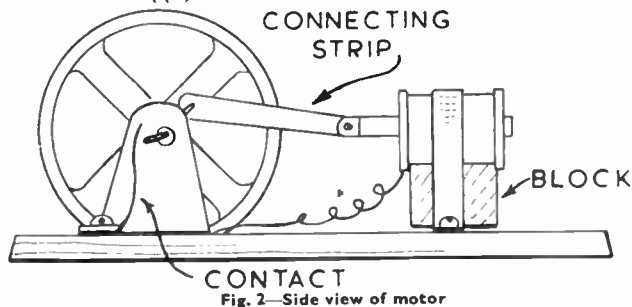


Fig. 2 - Side view of motor

Fig. 3) slides in a tube. This tube may be made from any non-magnetic metal (brass, zinc, copper, aluminium, etc.) and it is quite easy to bend a piece of suitable material round a pencil or other object to form the tube.

Alternatively, a thin ready-made tube can be used, a piece from the handle stem of an old cycle pump being excellent, if available. The core and tube should be of such a size that the core can slip inside easily. Iron must be used for

U-shape. This can then be soldered or otherwise fixed to the end of the core as shown in Fig. 1.

Beads or washers are placed each side the bearings to allow the crank to turn properly. (See Fig. 1). As the

(Continued foot of page 7)

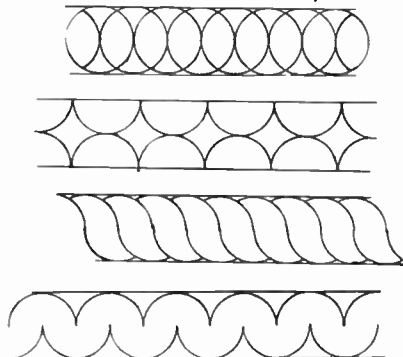
Tips on making a HAND PAINTED TRAY CLOTH

A HAND painted tray cloth (table cloth, cushion cover, or even a hand painted book-mark) makes a very handsome present and can be a delightful addition to any room. The work requires no special tools or ability, and extremely attractive results can be produced by the average hobbyist. The finished material will stand up to careful washing and the painted decoration should be quite permanent.

This article describes the making of a tray cloth but the same directions can be used for painting fabrics intended for other uses.

The Material

Choose linen if possible, or use any available unbleached material. Cut the material to the required size, turn in the edges and stitch them down to prevent



Some simple compass borders

fraying. The reader might prefer to buy a plain ready-made tray cloth on which to paint a border.

The Design

It will be wiser for the beginner to choose a simple geometric design rather than attempt the painting of flowers

which require rather an expert touch. A design can be worked out beforehand on paper and then pencilled on to the material. Transfer designs can be bought

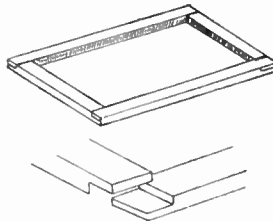


Fig. 1—The frame

from any needlework shop. These paper transfers are placed on the material, face downwards, and pressed with a hot iron when the design is transferred to the fabric. A third method is to pencil around the outlines of a cardboard stencil.

The Frame

The tray cloth must now be pinned to a frame so that it is kept straight and taut. It might be possible to use a suitably sized picture frame. Failing this a wooden frame can soon be constructed as in Fig. 1.

Sizing the Material

The next step is to put a coating of size over the marked out design. To make the size put 1oz. of gelatine into two thirds of a pint of water and allow it to soak for twelve hours. Now stand the pot holding the gelatine into a saucepan of water and gradually heat the pot until the gelatine dissolves and is quite hot.

Use a large, soft brush and paint the size over the design with the cloth stretched on the frame. When this is quite dry re-pencil the design where it is at all faint.

Painting the Design

Tubes of oil paints can be bought from

any art shop. Buy two or three tubes and decide quite definitely beforehand just how the design is to be painted.

Choose the first colour and squeeze a little on to some blotting paper. This absorbs the surplus oil and thickens the colour. Then, with a knife, lift the colour on to a palette or china saucer and mix it to the consistency of cream. If the paint is too thick it can be thinned with a little pure turpentine.

Knots

When wood is being prepared for painting, watch particularly for knots, for they either exude turpentine and resin, or absorb the paint. In either case, they leave unwanted marks on the painted surface. They can usually be 'killed' by painting them over with french polish or shellac dissolved in methylated spirit.

Use a soft brush and carefully paint in all the parts of the design needing that particular colour, and then proceed in the same way with the second and subsequent colours.

Should a second coat of paint be necessary, make sure that the first coat is thoroughly dry before beginning the new.

A more finished appearance is obtained by going over the outline with the paint just a little thicker, and using a very fine brush.

Fixing the Colours

When the paint is completely dry, lay the material face upwards on a thick ironing cloth. Cover it with a damp cloth and press down on this with a hot iron. Be careful not to rub the iron to and fro but simply press it downwards.

Take off the upper damp cloth and turn the material over. Now press the back of the tray cloth with a cool iron until the design side is quite smooth. (119)

Solenoid Motor—(Continued from page 6)

when the wheel is turned, the core should slide smoothly in and out of the solenoid. Make the electric connections as shown.

Proper Running

For proper running, electrical contact must be made and broken at the correct time. To arrange this, bend the thin contact strip so that contact is just made as the core begins to move into the solenoid and is not broken until the core is completely in. Contact should break before the core begins to move out again, and it will be best to curve the end of the contact slightly. (See Fig. 2).

When completed, the whole can be painted in bright colours, taking care not to get the paint on any of the moving parts. (208)

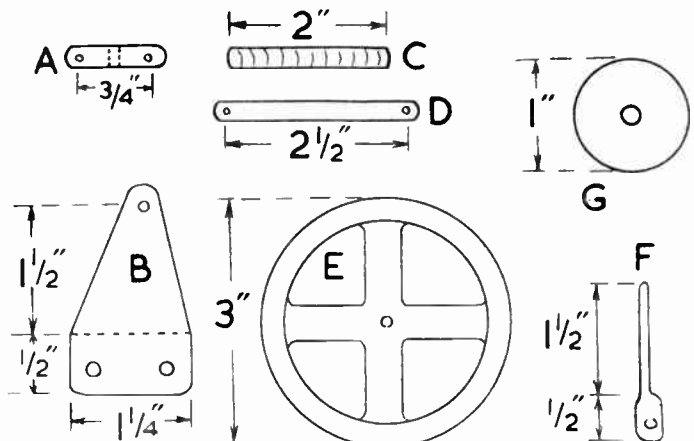


Fig. 3—Details of parts

Experiments with ferric chloride in HOME CHEMISTRY

BESIDES finding considerable use in industry, ferric chloride is a valuable reagent in the laboratory on account of its delicate colour reactions with certain substances. The blue it gives with ferrocyanides and the purple with salicylates allow us to detect minute quantities of them.

The deep red colouration ferric chloride gives with ammonium or potassium thiocyanate opens the way for us to a baffling conjuring trick for parties, and to the isolation of an interesting specimen of ferric thiocyanate, which is the substance which causes the colouration.

The Trick

First the conjuring trick. You propose to your audience that you intend to change orangeade into red wine and then into water and, since you are able to effect the changes so quickly, warn them not to blink! Put a little of the orange-coloured ferric chloride solution into a wine-glass. Add ammonium thiocyanate solution and in a flash the wine is there. Pour in a little mercuric chloride solution and, quick as lightning, the wine gives place to water. (The water is, of course, not drinkable!)

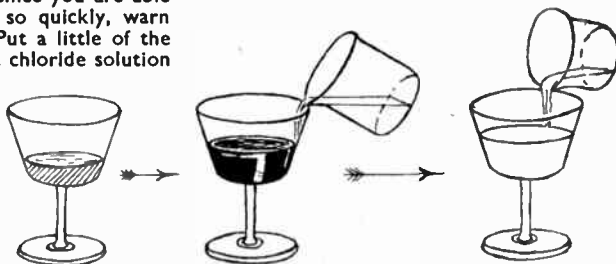


Fig. 1—Orangeade—into wine—into water. But do not drink it!

Ferric thiocyanate is not easy to separate from the reaction solution by evaporation. This may easily be effected, however, by shaking with ether. The substance dissolves in the ether and forms a layer above the water. The two non-mixing layers are then separated by using a separating funnel, as shown in Fig. 2. The colourless water solution is drained away by carefully turning the tap.

When a drop or two of the ether solution has passed through, close the tap and pour out the red solution through the top of the funnel into an evaporating dish. Put the solution in the open air to evaporate, as ether vapour is inflammable. The ferric thiocyanate will be left behind as splendid dark red crystals.

If you have no separating funnel, perform the shaking in a corked flask and draw off as much as possible of the ether layer with a pipette or fountain pen dropper.

Ferric chloride also produces red colourations with acetates and formates, though these are not so intense as with thiocyanates. But on boiling they throw down characteristic brown precipitates. In a beaker, mix solutions of sodium acetate and ferric chloride, note the colour of the solution and then boil for a few minutes. The brown precipitate

which forms is basic ferric acetate, which you can filter, wash and dry for your chemical stock.

Now repeat the experiment, but using sodium formate instead of sodium acetate. The precipitate in this case is basic ferric formate, which may be washed and dried in the same way as the acetate.

Ferric Hydroxide

By adding ammonium hydroxide to ferric chloride solution, a bulky brown precipitate of ferric hydroxide is formed. With this we can perform some interesting experiments. Dilute your ferric chloride until it has a yellow colour. Then add ammonium hydroxide while stirring until the liquid smells fairly strongly of ammonia. Allow the precipitate to sink a little and see if all the iron has been precipitated by adding a

water) to make a thin muddy suspension when the ferric hydroxide is stirred up. Generate chlorine from bleaching powder and dilute hydrochloric acid and pass the gas into the ferric hydroxide suspension.

The liquid slowly becomes purple and deposits a black powder. This is potassium ferrate, in which iron, normally a base, has become an acid, which is most unusual. When the ferric

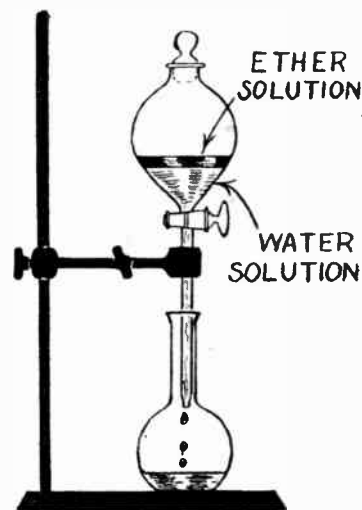


Fig. 2—Using a separating funnel

little more ammonia. If not, add more ammonia and test again in a few moments.

When the precipitation is complete pour the liquid into a big bottle or flask, almost fill with water, cork and shake. When the precipitate has settled, pour off the clear upper liquid and repeat the process twice more, when the ferric hydroxide will have been washed pure enough for our experiments. Now filter it off. Reserve one third of it for your chemical stock, and dry this on a saucer in the oven (it will shrink remarkably in drying).

Put the remainder into a beaker and pour on enough strong potassium hydroxide solution (one part of potassium hydroxide in an equal bulk of

hydroxide has all disappeared, pour off the liquid from the black powder. Wash it twice with a little water, and dry it on a clean porous brick or tile.

If you now shake a little of the potassium ferrate with water you will find it gives a red solution. Boil the solution and remove it from the flame. Light a wooden spill, blow it out and put the glowing end to the mouth of the test tube. It will burst into flame again, thus proving oxygen is being given off.

Divide the remaining potassium ferrate into two portions, one for your stock, the other for your next experiment. As the substance is not very stable in contact with air it should be kept in a small specimen tube, whose cork is sealed airtight with wax.

Barium Ferrate

With the other portion we can make the beautiful carmine-red barium ferrate. Dissolve the potassium ferrate in cold water and add barium chloride solution until no further precipitate is formed. Filter off the barium ferrate, wash it on the filter, and then open out the filter paper and place it on a porous tile to dry at room temperature. If you heat a little of the dry powder you will find oxygen is given off from this also. It is more stable than potassium ferrate and so only needs keeping in a tightly corked tube.

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Never neglect the advertisement pages of Hobbies Weekly. They are always worth your attention.

How to become a real AMATEUR PHOTOGRAPHER

BEFORE we can get very far with this rather intriguing subject it would be advisable to try to ascertain by what manner and means a *real* amateur is known. Has he any special characteristics which make him outstanding among the many thousands of other possessors of cameras? Is the particular camera he uses a much more expensive piece of apparatus than yours? Does he spend more time and money on the hobby than you can afford? Perhaps he has a special flair for taking what can be termed 'pictures'? Do you think he knows more about photography than you do?

Well, those are a few questions to which most of us can find suitable answers, and which will, undoubtedly, help us to find a difference between ourselves and the other fellows who, we are quite prepared to admit, are doing comparatively better work.

Higher Standard

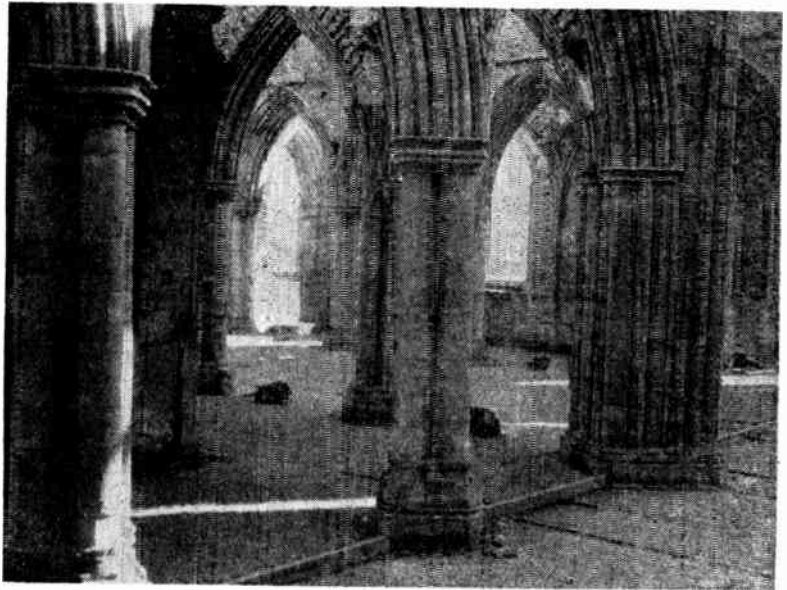
The object of this article is to help every reader of *Hobbies Weekly* to reach a higher standard of work. Undoubtedly there are a number of readers who have progressed with the hobby quite a long way, and probably a good few would consider that they are already 'real' amateurs. Well, good luck to them, and may they still go on becoming more and more enthusiastic.

Another season is well on its way. Easter has passed, and it is hoped that the great majority of you made good use of the holiday and have secured some topping negatives and prints. I also hope that you very carefully dusted the camera beforehand and selected a good brand of film; also that rather more care and thought was given in the choice of subject, lighting and exposure time.

I am going to make a suggestion regarding those prints. Mount them in a small album, or on a sheet of brown paper, and keep them in a spot where you can examine them frequently. It may be that, at times, you will find certain faults in one or other, and you will ask yourself why you took that particular view? On the other hand, some of the results may be a source of pleasure every time you look at them. If that is the case, then you can be assured that there is something good about them, especially if you feel that you could not improve on them.

At the end of the season, make a special point of comparing that batch of prints with a similar batch recently made, and it will be surprising, indeed, if you are not more pleased with the later results.

The reason you are asked to make this experiment is that it is one of the first steps we should take in making ourselves 'real' amateur photographers. It is a fact that, to become anything like



A picture of Abbey ruins taken by the author

a-worth-while camera user, you must be prepared to criticise your own efforts and to do so in a very truthful, and, if necessary, drastic manner. You should also, if possible, submit the prints to photographic friends for their criticisms. You will gain a tremendous lot of valuable help from one who has had, perhaps, years of experience.

Your Camera

That camera of yours. Have you thoroughly mastered all its gadgets, and the need and use of its various stops? The split second business of the shutter speeds? The varying distances on the distance scale? How far you can rely on the view-finder to include all the details as they actually appear on the film? Unless one is quite familiar with what the camera is capable of doing, then mistakes are bound to occur. On the other hand, the knowing will enable better work to be obtained in many instances.

It is a good thing and helpful to read one or two really good books on the hobby. Many of our public libraries have a comprehensive collection of these and usually they are written by some of the most 'real' amateurs.

When selecting such books, try to include one or two dealing with the technical side and others specially concerned with the artistic side, so that you can get help regarding composition which, obviously, must play an important part in the taking of each and every subject.

Whenever the opportunity presents itself, make a point of visiting any local photographic exhibition and be sure to thoroughly examine the prize-winning

prints. Try to criticise some of the prints, and endeavour to introduce what, from your viewpoint, would improve the picture. To illustrate this piece of advice, we will assume that you are criticising a landscape which happens to have a rather dark sky and you feel that you would prefer a lighter effect; or that that clump of trees on the right hand side is much too lightly printed.

Try now to imagine why the exhibitor preferred the dark sky. Possibly he was using a strong colour filter which would give this effect, or he may have purposely overprinted the sky in order to get a better balance in the whole 'ensemble'. With regard to the clump of trees, do you think it was intended to throw these into the middle distance or background so as to retain other objects in the foreground? If the trees had been printed deep they would show almost black and, perhaps, would have been too prominent. Go on criticising. It is jolly good practice, and you are teaching yourself a lot.

Specialise

It has frequently been advised in these articles that it is good to specialise, i.e., to devote time and interest on any one particular subject. Now this does not mean that every film you expose must be on this particular subject. Of course, there will be other subjects just as interesting, perhaps, more so, and you will, naturally, desire to have a shot at them. But here is the point that I want you to note. By specialising you will automatically study your subject at every opportunity.

(Continued foot of page 10)

MATTERS of INTEREST



A Silica Garden

CAN you tell me how to make a silica garden, using water-glass, etc.? I imagine it must be a kind of chemical rockery, the water-glass precipitating crystal-like formations. I have heard of 'Flowers from Coal', obtained, I believe, with the use of red ink, washing blue and salt. I expect the silica garden is something on these lines. (T.H.—Westbury).

THE term Silica Garden is sometimes applied to sand gardens in miniature, in which the general contours are made with fine sand, and sands of different colours—e.g. Watford sand is a rich reddish yellow, Devon sand is red, Leighton sand is pale beige colour and silver sand is white. Crystalline 'flowers' can be formed by pouring various liquids on to the sand. For example, ordinary washing soda if repeatedly boiled until nearly all the liquid has been evaporated, will in a short time (some days), produce 'flowers' which are reasonably stable and enduring. Common salt, sal-ammoniac and many other materials act in a similar way; each

produces a different and characteristic formation.

Leakless Aquarium

I HAVE made an angle-iron frame for a fish tank. It is 2ft. by 1ft. by 1ft. by $1\frac{1}{2}$ ins. by $1\frac{1}{2}$ ins. angle-iron. I have $\frac{1}{2}$ in. plate glass for the side and a sheet of frosted wired glass for the bottom. What I want to know, is how to fasten these in so they will not leak and will not harm the fish. Please let me know what is the best way of fixing these sides to make them watertight and never leak? (L.M.—Rugeley).

THERE are several good makes of cement for the purpose of fixing glass in angle-iron frames, and such are equally effective and much less trouble to the amateur than home-made cements. A 24in. tank requires 2lbs. You might try the aquarists' dealers in your district. The way to fix is as follows:—the glass must, of course, fit the framework. The base is fitted first, followed by the two long sides, leaving the ends to the last. The glass must be pressed well home,

and all excess cement removed with a knife. Leave a few days for the cement to harden thoroughly before filling tank with water. Do the whole job carefully and thoroughly, to ensure tank is perfectly watertight.

Conversion

IS it possible to convert a magic lantern into an epidiascope? I have quite a large lantern and have carried out a few experiments with lighting and mirrors, without success. (D.T.—Upwood).

IT is most improbable that a magic lantern could readily be converted to an epidiascope—chiefly because the lens system of the magic lantern is unsuited to an epidiascope. The most likely method would be to use only the projector lens—place it in a box with the back of the box about the same distance from the lens as the present distance from it to the lantern slide carrier. The box will, of course, have an aperture for the lens (which can be used in its focussing jacket), and the back will have to be arranged to receive the objects to be projected. Strongly illumine the object from the front, but shield all the light rays from impinging on the lens. Adequate ventilation must be provided, and various obvious details dealt with, but the result depends largely upon experiment to attain the best effects. As previously stated, we do not consider such a conversion to be worth while.

Become a real Amateur Photographer—(Continued from page 9)

If you specialise in landscapes or interiors, you will find yourself examining every picture of a landscape or interior wherever and whenever you come across one. It may be in a gallery, shop or even a paper or magazine, and the result will be that when you strike an example of these subjects in your rambles it will not take you many seconds to decide whether it is worth while, and to make up your mind on the best angle for making the shot.

It also follows that this concentration on the most important branch of your photography is bound to have a material effect on all your other work. In fact, it is almost a guarantee that at least 90 per cent of your exposures will be made only after some careful thought has been expended on the subject beforehand—with the result that a good negative and print is added to the collection.

At this stage you might be feeling ready to find some sort of excuse for your camera. You might say that it is only a cheap one for taking holiday snaps, and that you only expose two or three spools in a season and are not really very keen. Well there is, of course, much to be said in favour of 'pukka' apparatus. Obviously, if it cost forty guineas, it should be capable of giving better results than a camera costing a couple of guineas. But, and this with full emphasis, forget what you paid for your camera. If it was made by a reputable firm, then it is capable of

turning out some good work, and it is really up to you to find out all its capabilities and to use them to the fullest advantage. That is exactly what the fellow who owns the forty guinea camera has done, and is doing. And remember that he has a greater chance of making mistakes, for the simple reason there are more little items to be thought of and manipulated with his equipment than with yours.

Now for the point that you only expose two or three spools a year and that you are not really keen. Is that a fair excuse for not wishing to do better work? Of course not. Here you have a machine that is able to give you something worthwhile, if you will co-operate with it by giving a little more thought every time you make use of it—even if this is only a couple of dozen times a year. Why not strive to bring back from the summer holiday a batch of pleasing reminiscences rather than a collection of haphazard 'snaps'—including many duds, which make you feel that the hobby is rather expensive.

Let us consider finally the question of expense or, as I put it in the opening paragraph: 'Does a 'real' amateur spend more money on the hobby than you can afford?' As a keen amateur of many years standing I can honestly say that I do not begrudge one penny that the hobby has cost me, for it has paid me some good dividends, considerably added to the pleasure of my holidays, made me find out the beauty spots in my neighbourhood

and made me go for jaunts in the country which I would otherwise have missed. And on the walls of my home there are many pictures which are a source of joy to me and interest to my friends.

In your town there is probably a Camera Club. Do not lose any time in joining it. The fees are usually very small, but the amount of practical help which you will gain from the lectures and demonstrations is really incalculable. You will find that the majority of members are 'real' amateurs, and always ready to give you some sound advice, either at the meetings or on the excursions which constitute part of the year's programme.

A term applied to a large number of camera owners is 'button-pushers'. It implies that these folk know nothing whatever about photography except how to press the button or trigger, letting the camera do the rest. Little thought is expended on what they take. Quite frequently the spool of film is so carelessly placed in the holder that after three or four exposures it cannot be released any further because it has 'stuck'. Further, when the eight or twelve exposures have been made, the spool is taken to the chemist for him to develop and print.

With that description of the 'unreal' amateur—and bearing in mind the various items discussed—it is hoped that you now realise how very easy it is to become a 'real' amateur photographer.

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The SHIPMODELLER'S Corner



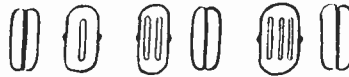
THE making of the numerous blocks required for a model ship presents many problems, for the beginner especially; we are, therefore, going to review the different types and the methods that have been proved successful in reproducing them in miniature.

The scale of your model will, naturally, govern the size of your blocks and the amount of detail you will incorporate; of the large variety of blocks those that will mainly concern the ship modeller will be single and double blocks, with occasionally triple blocks, Fig. 1 showing the three varieties.

As most of our kit models are of small scale we will first deal with the making of small wooden blocks. In actual practice, a block consists of one or more housings, each containing a

Blocks and How to Make Them

By 'Whipstaff'

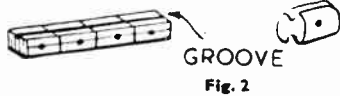


SINGLE BLOCK

DOUBLE BLOCK

TRIPLE BLOCK

Fig. 1



GROOVE
Fig. 2

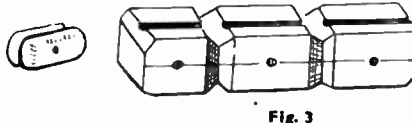


Fig. 3

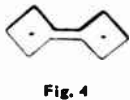
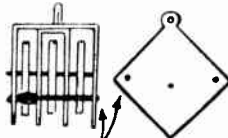


Fig. 4



Fig. 5



BRACE RODS



Fig. 6

'sheave' or pulley wheel, later metal blocks having metal sheaves and housings, whilst the earlier blocks were of wood with brass sheaves. Brass sheaves in wooden blocks are mentioned in Naval Accounts as early as the reign of Henry VII.

For our wooden blocks we will take a strip of boxwood or holly (a boxwood ruler can be split into suitable lengths), and for our first attempt we will make them from a piece planed to exactly $\frac{1}{2}$ in. by $\frac{3}{8}$ in. For your model you will, of course, have to make them to suitable scale.

With a pencil and a small square, mark off your length in $\frac{3}{8}$ in. sections, and down the exact centre of your two narrower edges ($\frac{3}{8}$ in.), cut a groove with a knife or small gouge for the strap grooves. On the two $\frac{1}{2}$ in. edges, we now pencil a line down the exact centre. This may be done on one side only, and on this line in the centre of each $\frac{3}{8}$ in. section we drill a small hole for the sheave for single blocks; for double blocks we drill two holes, one each side of the centre line, and for treble blocks, one on the centre line and one each side of the line. (See Fig. 2).

Having proceeded so far, we now take a sharp knife and cut V grooves across the strip at the $\frac{3}{8}$ in. stations as in Fig. 3, and file all outside edges until they are nicely rounded off.

The next step is to gouge or file a small groove from the heel of the block to the drilled sheave holes, as in Fig. 3.

The blocks can now be separated with a jeweller's saw, a small Hobbies model saw or razor blade, and, taking each block in turn between the thumb and fingers of the left hand, file the V cuts at the ends into smooth curves, leaving the face of the block oval in shape.

Strips of plastic of the 'Catalin' class may be used in place of wood, or blocks can be made on the mould system using plastic wood as in my recent article on deadeyes.

Some modellers make their blocks by squeezing small pellets of plastic wood between thumb and forefinger, piercing with two pins, as in Fig. 5, for sheave holes.

In all cases where plastic wood is used, you have the tedious job of filing the groove around the edge, and for this reason, among others, I much prefer making them on the strip method outlined above.

For model makers working to larger scale, and who come up against the problem of metal blocks, the following method will produce first-class

miniature blocks. Obtain some thin tin—cigarette or tobacco tins will provide a supply—and cut metal housings to the shape shown in Fig. 4, and bend to shape.

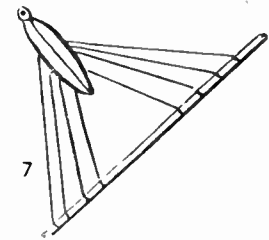
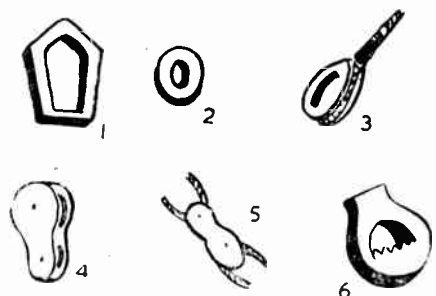
Sheaves can be turned to shape from erinold knitting needles or dowel rod of suitable diameter, using the methods I outlined for deadeyes. The axle may be made from a pin, cut to size and spot soldered at the ends to the housings when sheave is in position.

For triple blocks it is necessary to cut an inner housing and solder in position as in Fig. 6. In this case it is also essential to strengthen your blocks in the customary manner with brace rods, and these are also shown in Fig. 6, with drilled holes for them. Again spot solder the ends to the housing.

If you do not fancy your chance of soldering in very small places, drop a spot of Duroflux on the end or clench the ends over, in which case you will have to cut axle and brace rods slightly longer.

We will now proceed to fit our wood blocks with the necessary strop and hook or eye. First, make a note of the number, if any, of blocks you require with hooks, and the

(Continued foot of page 12)



TURNBUCKLE 8

Fig. 7

An Adjustable Seed Sowing Tray

THE sowing of seeds is a fascinating job for the gardener, but it can also be most annoying at times. The seed packet is not an ideal medium for distributing the seeds in an even manner, nor is the method of holding them between thumb and finger and sprinkling like salt to be recommended. Some seeds are liable to be damaged by this method.

The seed sowing tray described, with its adjustable mouth, has proved suitable for the job. Although so simple this has in no way impaired its efficiency.

It consists of a triangular tray for holding the seeds and an adjustable mouth which enables different size seeds to escape through at varying speeds. If you want seeds to be sown thinly in the row the opening is made quite narrow so that only one can escape at a time, while by enlarging the outlet it would be suitable for sowing cress or large seeds.

The baseboard of the little gadget is made of thin plywood. The size can be altered if it is wanted to hold more or larger seeds but the sizes given will make a good all-round tool. Cut a piece 6½ ins. long and 3 ins. wide to the shape shown in the sketch. It will be noted that the mouth opening is cut on

the slant, which is for the path taken by the spring arm.

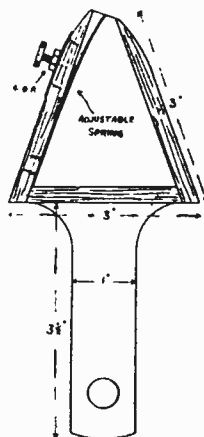
The three sides of the tray are strips of wood ½ in. wide and ¼ in. thick, and the two sides are tapered off towards the mouth. Glue and pin these in position, making sure that there are no gaps for small seeds to roll through.

When dry, glasspaper thoroughly to make the tray quite smooth. The

adjustable arm is made from a piece of clock mainspring screwed to the side of the tray with two screws. Soften the end to drill or punch the holes, and then cut to length and with fine emery paper polish and make quite smooth. When fixing the spring to the side strip keep it close to the tray bottom so that there is no gap for small seeds to escape underneath. A well polished ply tray and spring edge will ensure a sure and easy movement.

The screw for adjustment is a brass 4 B.A. wireless thread fixed near the mouth of the tray. Solder a 4 B.A. nut on to a strip of brass and screw to the side, making a smooth and effective adjustment. The short handle makes manipulation easy and the hole enables it to be hung up in the tool shed where it can be found easily.

If the tray is not considered smooth enough for small seeds to roll easily a coat or two of french polish would probably make it more efficient. Do not load the tray with too many seeds at a time—it would be found to work much better when only partly filled. Try it out first by 'sowing' a few seeds on to a sheet of newspaper before letting them loose in the garden. (202)



Details of the tray

Shipmodeller's Corner—(Continued from page 11)

remainder can then be fitted with eyes. Use fine wire for your strops (fuse wire or copper wire from inside ordinary electric light flex is ideal), and twist your strop around the block and into hook or eye as required. Solder joint, if you can do so, or again secure with Durofix. (See Fig. 6).

In period ship modelling we find many various types of blocks in use for specific purposes. They will be shown on your rigging plan, and Fig. 7 shows a few of the more common types.

No. 1 is an early type of heart. It is better cut from thin black plastic of the Catalin variety, using a Hobbies metal cutting fretsaw blade. It can also be made from suitable wire, soldered at the join and flattened slightly in a vice.

No. 2: a bull's-eye. This can be turned as with deadeyes, or the ordinary commercial deadeye with a single hole can be used if of suitable size.

No. 3: a bullet-block. Take a piece of dowel of suitable size for your scale, and sand it lengthways until it is oval instead of round. Cut off your blocks, slightly crown the faces and drill in a jig as described in my article on deadeyes. The hole can be lengthened with a hot needle or small watchmaker's file.

No. 4 is a long block, and can be made from a strip of holly, boxwood or plastic, being shaped lengthways to the shape of the block. Cut each block off and drill holes for sheaves.

No. 5: early sister block. Make in similar manner to No. 4.

No. 6 is another early heart, and can be cut from plastic to give greatest

strength for such a small fitting.

No. 7: crows-foot. A most intriguing block, much in use in early vessels, they can be made from strips of wood, boxwood or holly, cut off and drilled down the centre with the number of holes required for your model.

Do not forget to keep your blocks in scale. Overscale blocks and deadeyes spoil the appearance of any model.

Make your single blocks to scale and then make your double blocks one and one third times as wide as your single blocks. Triple blocks can be one and two thirds the width of the single blocks, and all double and single must be proportionately thicker.

In modelling later types we come across another fitting which, although not itself a block, can be dealt with here as it replaces the earlier method of setting up rigging; that is, standing rigging, with deadeyes. (No. 8, Fig. 7).

These are turnbuckles or turn-screws, and to make working miniatures of these requires experience and a precision lathe. This is out of reach of the average modeler and commercial turnbuckles which can be bought may be overscale for

your particular model.

Here is a simple method of making 'dummy' turnbuckles, which look right and give a realistic effect when fitted to your model. First, obtain some wire of suitable diameter, and, allowing for an eye at each end, cut into lengths of the correct size for your model. Your rigging plan should give this length. Having done this, turn an eye in each end with your long nosed pliers and drop a spot of solder on to secure it.

Next apply enough solder to the middle portion to build it up to the appearance of a turnbuckle and finish off smoothly with a file or glasspaper.

Any question on blocks will be answered and we will be pleased to receive any questions from modellers who are in difficulty with any particular model, if submitted to our Editor.



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NOTES ON WATERMARKS

THE importance of watermarks is not sufficiently understood by many young stamp collectors. One often hears the remark: 'Oh, I do not collect watermarks'—as though they were something different from ordinary postage stamps instead of a very definite part of the stamp.

It is almost impossible to collect stamps without collecting watermarks, as by far the larger proportion of the stamps issued are printed on paper having a watermark. Really, what the collector means is that he does not bother whether the stamp has a watermark or not. Now this is a very great pity, because the watermark of a stamp can frequently give a lot of information even to the novice.

What is it?

What exactly is the watermark, and how does it get where it is? Is it put in at the same time as the stamp is printed or is it before or after? The answer to this is best found out by looking at a sheet of plain paper. White unlined paper will often show a watermark, and you can be almost certain of seeing one when you look at blotting paper. Try one or two different sorts of paper, as you will not always see it; in fact, it would be a good thing to look at as many different sorts as possible.

Now, the paper on which stamps are printed is especially prepared and only the correct amount for an issue is sent to the printer. A stamp is a small picture and it is quite possible for one such small picture to be placed on the sheet in such a way that it escapes a watermark. Then you would have a stamp without a watermark, although the proper issue is supposed to have one.

How it is Done

The way in which the design called the watermark comes to the paper is best explained by describing the way in which paper is made. The paper is made from such materials as rags, wood pulp, or esparto grass; sometimes from a mixture of all these. The materials are boiled with alkali and bleached, and the resulting pulp is made to a consistency of cream. Then, when it is ready, the pulp is taken into what looks just like a sieve. The water will then run through and the paper fibres will remain on the wires of the sieve.

Now, the watermark is the result of sewing small pieces of wire on the sieve. These pieces of wire have been bent into the shape of letters or other design, and when the paper is dry and held up to the light, the design shows through. If one considers machine-made paper, then instead of speaking of a sieve one talks

about the dandy roll, on which the design is sewn. Again this design may be in wire, or it may be stamped out of sheet brass and sewn or soldered on to the dandy roll.

As to seeing the actual watermark on the stamp, the first point that must be obvious is that all the paper must be removed from the back of the stamp. For one thing the stamp may have a watermark that would be obscured by the piece of paper, and for another the paper on the stamp may have its own watermark which you might mistake for the watermark of the stamp. When you remove the paper from the back of the stamp, you will have the stamp wet or at least moist. Then is the time to look for the watermark. It shows up so much better when it is wet. If you are still unable to make out what it is, then place a drop of benzine on the back of the stamp and this should bring out the design quite easily.

Seeing the Mark Clearly

If, as a start, you wish to see a watermark very clearly, examine a block of the stamps as they are sold over the counter at the post office, you should very easily see the 'G v1 R' with the small crown above the 'v1' since you look at the back of the stamp, the letters will appear reversed, so if you place the block of stamps face downwards on a piece of black paper or the cover of a book and then hold it so that you can see it through a looking glass, you will see the letters appear quite correctly.

Now, having seen one watermark easily, how about looking at other stamps in your album? Take some of the British Colonials as a beginning. Most likely you will see the letters C.A. standing for Crown Agencies. If you look at stamps printed before 1921, then the letters will be in block capitals, but if you look at stamps issued after that, then it will be what is called 'Script C.A.' with a crown above. In this case, the letters look as though they have been written with a pen. Sometimes you will see just one crown and the letters C.A. and sometimes you will see that the

letters are not central and you see more than one set. The first case is one of 'single C.A.', and the second 'multiple C.A.'

Some stamps have rather curious designs for watermarks. For instance, little turtles are depicted on the stamps from Tonga. A sun, as it is usually called (though it looks more like a man in the moon), comes from the Argentine, the early stamps of Egypt have a pyramid, and the early Jamaican stamps a pineapple. There is an elephant's head for the early stamps (before 1877) of India.

Expensive Mistake

The Cape of Good Hope at first used an anchor, then later changed this to a cabled anchor, and this brings up a rather curious valuable stamp. By mistake, the one penny value of the 1905 issue of Transvaal was printed on a few sheets of paper which should have been kept for the Cape of Good Hope, so that a few of the one penny Transvaal stamps have a watermark of a cabled anchor instead of Multiple Crown C.A. Such stamps are worth about £20 instead of one penny. Not a bad return for studying watermarks is it?

Another example comes to mind, and this time from Newfoundland. The three air stamps of 1931—15c., 50c. and 1 dollar—were first issued in January without any watermark and the three are catalogued at £5 12s. 6d. Three months later the same designs were used, but on watermarked paper, and the value of these is £8 8s. 0d.

Then there is the rather curious example of the 1922 issue from Tanganyika, the stamps showing the head of a giraffe. The watermark is the multiple script C.A., but the unusual aspect is that the higher values were issued with the watermark upright and also with the watermark sideways. In each value, the stamp with the watermark sideways is worth more than the stamp with the watermark upright.

English Error

A watermark error occurs on one of the English stamps. In 1862 a threepenny stamp was issued with what is described as an 'emblems' watermark, that is to say that in the top corners were two roses and in the bottom corners a thistle and a shamrock. By mistake the thistle got replaced by another rose, so that a few stamps have three roses and one shamrock, and a used copy of this is worth about £25.

Well, these examples of the differences in the values of stamps that seem to be similar until you look at the watermark should have convinced you of the necessity of spotting watermarks. What are you going to do about it? (122)

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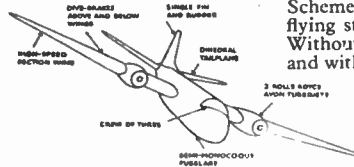


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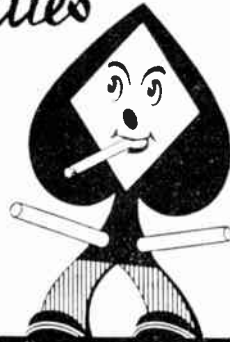
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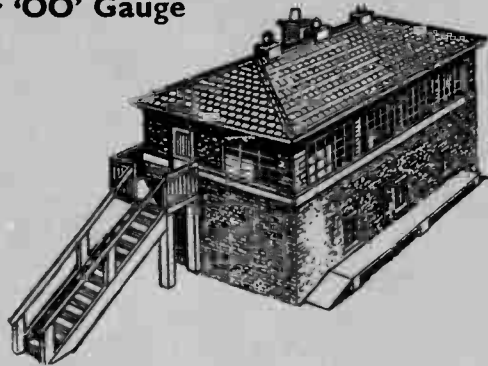
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WEEKLY

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April 25th, 1951

Price Fourpence

Vol. 112 No. 2895

Now is the time to make this portable LAWN MOWER HOUSE

THE lawn mower frequently gets badly treated by being left out-of-doors during the summer—and sometimes all the worst part of the winter as well. Sometimes it may get covered up and protected from rain and damp, but all too frequently it is just too much trouble to put it away brushed and cleaned off after each using.

Part of the trouble, perhaps, is that the tool house or shed where the mower belongs is often at the far end of the garden.

We show here how to make a made-to-measure portable house to fit the lawn mower. It could well be stood in a small corner of the lawn or adjacent to the tool shed, which, even if not too far

away, may have become chock-a-block with tools and, perhaps, a goodly amount of junk at the expense of the mower.

The house is simple to build and economical as regards timber, etc. It is made so that the mower can be run into it easily and shut in by a pair of doors, which, being made purposely very narrow, take up the minimum of space.

Our illustration of the house speaks for itself, and the following details and description make it clear how it is constructed.

First, it will be necessary to have some sort of floor for the mower

to stand on. A wood floor is not advisable, as this will soon rot if laid direct on the ground. A square of concrete with 1in. or so showing above the ground surface is, perhaps, the best, but care is needed in the mixing and the laying of this, and by many would, no doubt, be thought not worth the time and trouble.

Next best would be a brick floor laid as shown in Fig. 1. Old bricks, providing they are fairly even and whole would answer well, and if laid to the plan shown, only twenty-four bricks are required for the whole floor. They should be laid to half-depth in the ground and bedded firmly on sand.

If a little cement grout could be mixed up and run into the joints of the

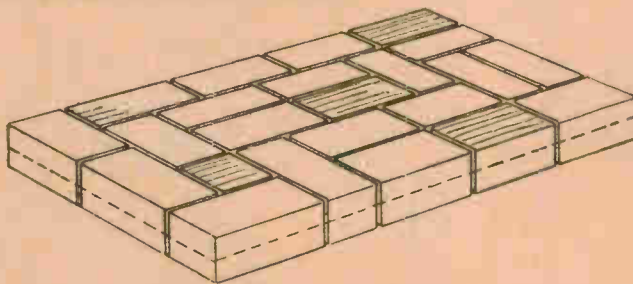
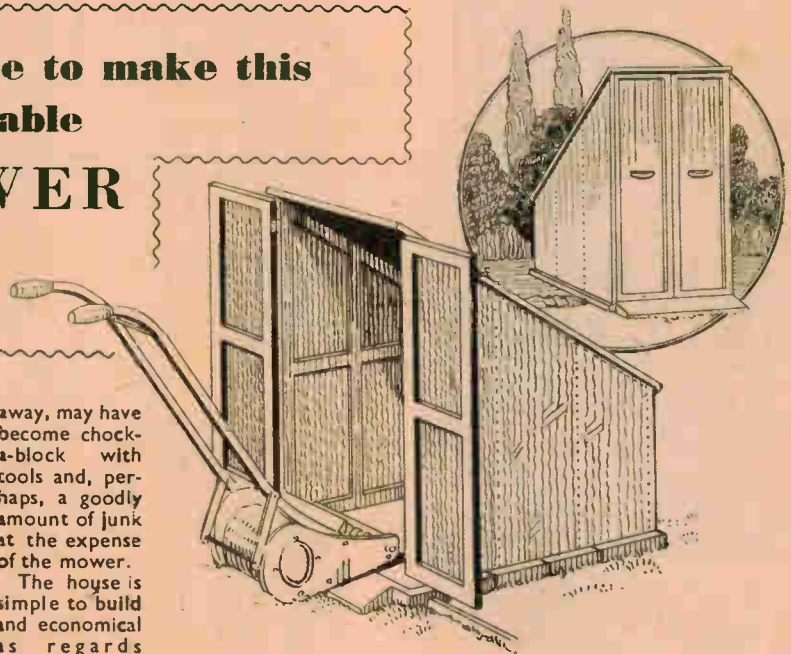


Fig. 1—How the brick floor can be laid



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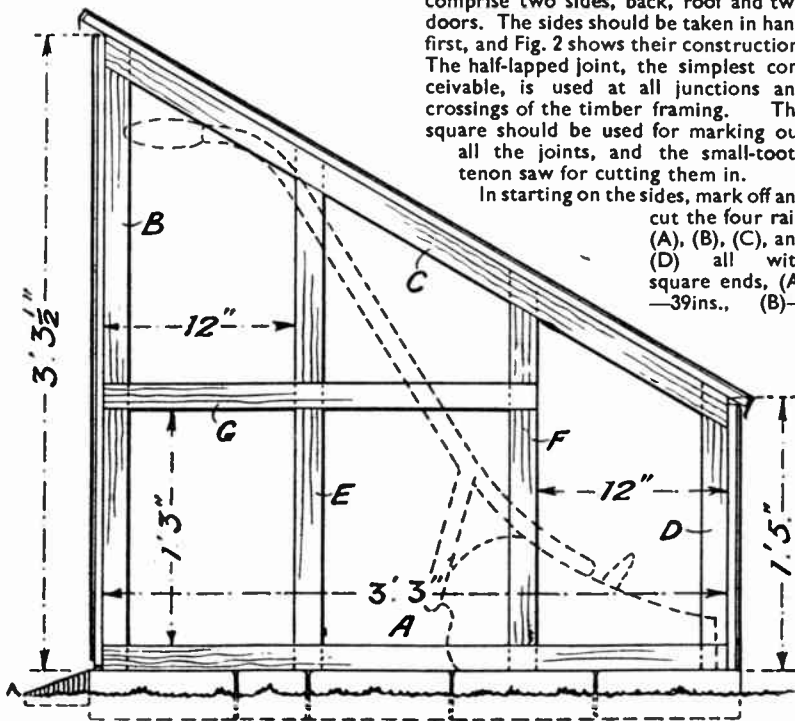


Fig. 2—Details of the sides

comprise two sides, back, roof and two doors. The sides should be taken in hand first, and Fig. 2 shows their construction. The half-lapped joint, the simplest conceivable, is used at all junctions and crossings of the timber framing. The square should be used for marking out all the joints, and the small-tooth tenon saw for cutting them in.

In starting on the sides, mark off and cut the four rails (A), (B), (C), and (D) all with square ends, (A)—39ins., (B)—

(B) and (D) resting on top of rails (A) and (C), and with their ends arranged ready for marking across with the pencil to form the halving joints. See that rails (B) and (D) are at right angles with rail (A) before marking across. Then set out the joints, cut them and nail them together.

Next cut rails (E) and (F), lengths 33ins., and 25ins., respectively, lay them across the frame and mark off the angles of rail (C) and the square joints at the base on rail (A). Cut the joints in all the rails and nail them together.

Finally, lay the horizontal rail (G) across as shown and treat the joints in the same way. A strong and sturdy framework should result, and having completed this one, the second frame can easily be made up from it, the rails being all simply laid on and marked.

Trim off the ends of the upright rails where they project beyond the sloping roof rails. Fig. 3 gives a good idea of how the halving joints will appear after cutting and just before assembly.

The Back Frame

The frame forming the back of the house is shown in Fig. 4. Here again the simple halving joint is used and further explanation need hardly be given. The enlarged detail in Fig. 4 shows exactly how the felt or Ruberoid will be nailed on. The back frame, when completed, will butt on to the edges of the uprights (D) (see Fig. 1) and will be either nailed or screwed.

(Continued foot of page 19)

bricks, so much the better. During the laying of the bricks, four pieces of strip hoop iron about 7 or 8ins. long should be built into some of the joints to hold the house securely in position. The strips should be bent at right angles for about 1in. to lie under the bricks, then brought up for 3ins., twisted and punched with a hole through which a nail or a screw is run into the lower rails of the framing.

39 1/2 ins., (C)—46ins. and (D)—18ins. Lay these flat on the ground and in their true position, rails

The House

This is built in six distinct and separate sections, or panels, including the two doors, and wood 1 1/2 ins. by 1/2 in. in section is used throughout. Each panel is afterwards covered with felt or Ruberoid.

The panels

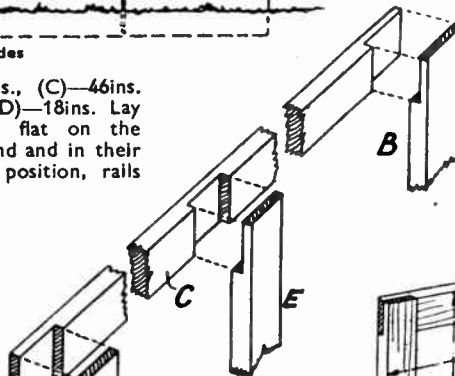


Fig. 3—The halving joints for the side frames

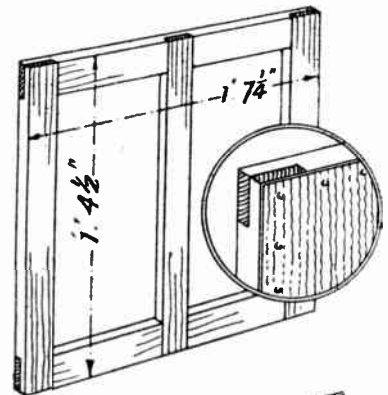


Fig. 4—Dimensions of the back frame

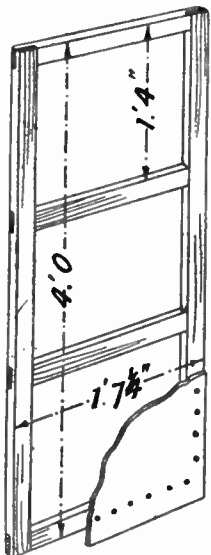


Fig. 5—The roof

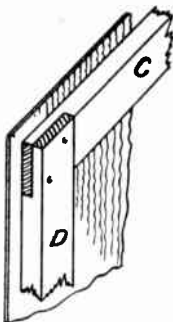


Fig. 6—The finish at the back rails

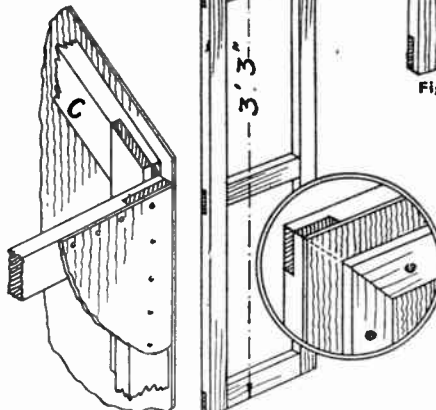


Fig. 7—Details for the doors

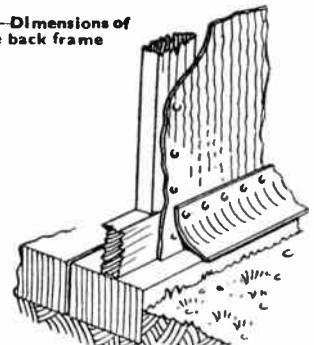


Fig. 8—The weatherproof skirting

It is not hard to make a SWING FOR A CHILD

THIS child's swing is simple to make and set up, and, as well as providing amusement for baby, it keeps him in one place while mother does some work!

Start the construction with the seat. This is a piece of wood 12ins. square by 1in. thick. If it is impossible to obtain a piece of wood this size, the seat can be made from two pieces 12ins. long by 6ins. wide by $\frac{1}{2}$ in. thick, sandwiched between two pieces of plywood 12ins. square by $\frac{1}{4}$ in. thick.

If the latter method is used, the pieces should be glued and screwed together, the screws being countersunk and the holes filled with plastic wood.

Next, $\frac{3}{8}$ in. diameter holes are drilled in each of four corners of the seat, their centres being $\frac{3}{8}$ in. from each edge. The corners and edges are now smoothed off and the seat is then complete.

Safety Bars

After this, the eight safety bars are made. These are each 12ins. long by $\frac{1}{2}$ in. wide by $\frac{3}{8}$ in. thick, and should be cut from a piece of three-ply. When this has been done, a $\frac{3}{8}$ in. diameter hole is drilled in each end and the wooden portions of the swing are made.

The distance tubes that keep the safety bars apart are cut from a piece of copper or brass tube 18ins. long by 18 S.W.G. This should be cut into eight equal lengths of 2 $\frac{1}{2}$ ins.

The parts should be painted to individual taste, and then all that remains to do is to put the cords in place. In the original, a good quality clothes line was used.

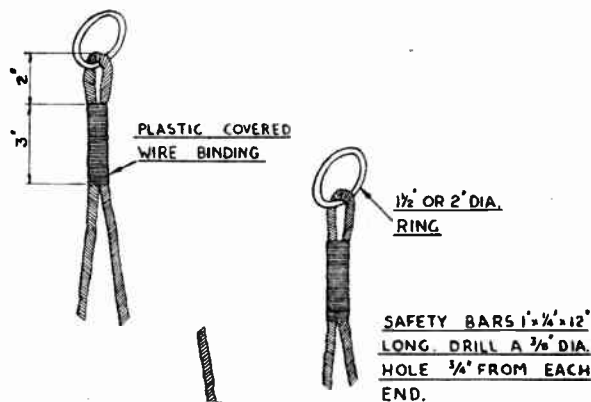
Two lengths should be cut approximately 10ft. long, but the exact length will depend on the position the swing is to be used in.

A large knot is tied at one end of one of the lengths of cord, which is then threaded through one of the holes in the seat. The cord is then threaded through one of the distance tubes and two safety bars. Another distance tube is then slipped on and finally two more safety bars.

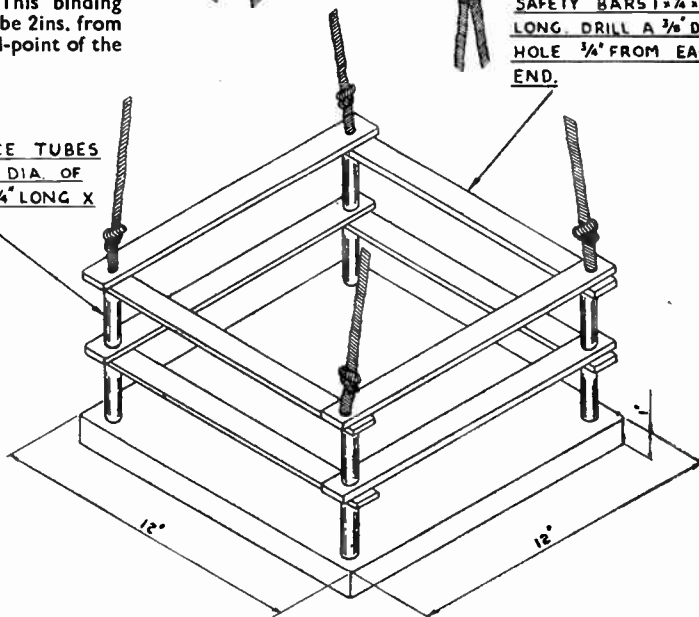
Another large knot is tied in the cord at such a position to allow a certain

amount of movement of the safety bars when the child sits in the swing.

The piece of cord should now be folded at its mid-position, a curtain ring about $1\frac{1}{2}$ ins. or 2ins. diameter put on and held in place by binding the cord together with plastic covered wire over a length of 3ins. This binding should be 2ins. from the mid-point of the cord.



DISTANCE TUBES TO SUIT DIA. OF CORD. 2 $\frac{1}{4}$ \"/>



Details of the construction

The length of cord is now taken down to the next corner of the seat. A knot is tied first, and then the other end of the top safety bar is picked up. A new safety bar is added, a distance tube, and then another new bar.

The cord is now threaded through the other hole of the bottom bar, another distance tube, and finally through the hole in the seat and secured by a large

knot underneath.

The other cord is attached in a similar manner, and when this has been done the eight safety bars should be in position all round the swing.

Setting up the swing indoors is quite an easy matter. Two strong hooks can be screwed into the top of the door frame, and the rings in each cord attached to them. (213)

Portable Lawn Mower House—(Continued from page 18)

A somewhat similar frame to the back is made for the roof, and dimensions and plan of rails are shown in Fig. 5. The felt or Ruberoid for this frame is cut flush at the sides, but should overlap at the top and bottom as shown in the cut-away detail of the corner. When covering the main side frames with the felt, allow this to project about $\frac{3}{8}$ in. or $\frac{1}{2}$ in. on the back upright edges and along the sloping edge of the roof rails. The two details at Fig. 6 show the finish at the back rails, the one on the right, after the back panel has been nailed in.

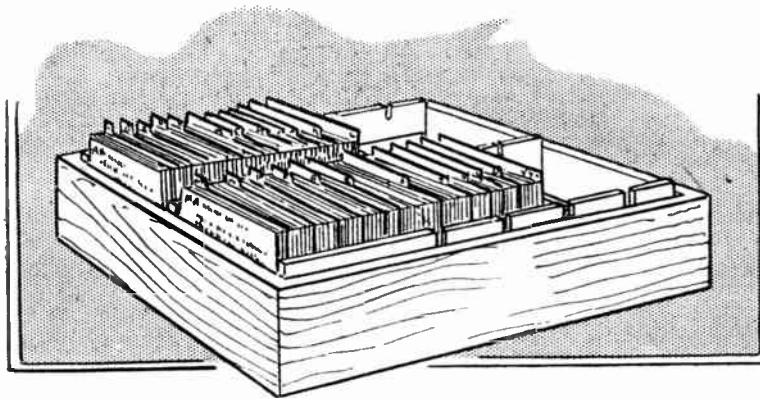
All frames should now be firmly held together, any necessary blockings for strengthening may be added before the doors are made and hung.

Two simple narrow frames for the doors are made up as Fig. 7, and covered with the felt or Ruberoid. As a strengthening medium, lengths of ordinary builders' sawn laths may be cut, mitred and nailed on as shown in the circled diagram in Fig. 7. The doors are hung to the upright rails (B) with ordinary butt hinges, brass if possible, and made to close neatly in the middle, a covering

lath being nailed to one of the doors if desired. Block handles or knobs can be fixed.

To form a good weatherproof skirting to the sides of the house, strips of Ruberoid should be cut off and nailed with broad-head tacks as shown in Fig. 8 and allowed to just overhang the brick edge so as to throw the water clear. It would be a good plan to coat all the timbering with creosote or other wood preservative before the outside covering material is tacked on. (226)

Save your hints and tips by making A HANDY CARD INDEX BOX



THE many useful hints and tips published from time to time in *Hobbies Weekly* should certainly be saved for future reference. The daily and weekly journals also furnish quite useful items, especially recipes, which it seems a pity to destroy, as one never knows when they may come in useful. One valuable method is to card index them, as this system has at least an advantage over the old-fashioned habit of pasting them in a book—it is never full up.

For a simple card index, a box should first be provided. This could be just made of cardboard, and would probably last quite a while, but a stronger and more lasting case could be made of wood. Then it may last for years, and prove a mine of valuable information in the home or workshop.

Any Wood

For the box, any deal could be employed, or even that from a grocer's box, come to that, as some of these are made

from quite a good timber. A lid is desirable to keep out dust, and to ensure a close fitting one, a good plan is to make box and lid as one and then saw the lid portion off it.

A suitable size of box is given in

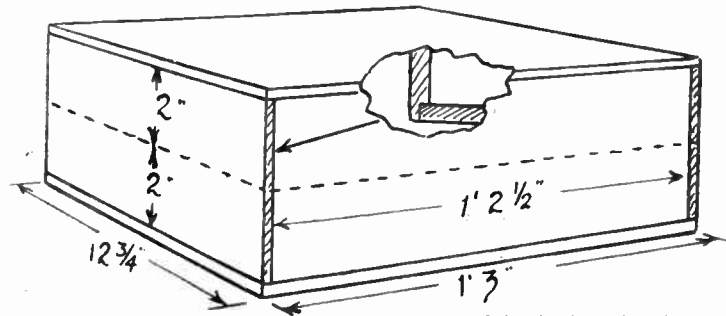


Fig. 1—Suitable dimensions for a box

Fig. 1. The width is enough for two compartments, and is calculated on the assumption that $\frac{1}{4}$ in. thick wood is employed for all four sides of the box, and central division. If wood of a different thickness has to be used, the dimensions given should be amended, as necessary, to ensure the actual width of the compartments is the same. The length can be increased, if desired, without trouble.

Rebate the Corners

The corners of the box are rebated, as shown in the inset, and nailed and glued together. The top and bottom can be of plywood or hardboard, as may be convenient, and are glued and pinned in place. When the glue is set hard, set a gauge to the height of the box portion (2 ins.) plus the thickness of the bottom, and gauge a line all round. Saw above this line to divide the whole, the top portion being, of course, the lid.

The best method to adopt,

when sawing, is to cut through the wood at front and back first, then to saw through the sides. Glasspaper the sawn edges to smoothness, and to prevent rounding them in the process, pin the glasspaper to a flat bench top, and rub the two halves of the box across it. Lay the lid on one side.

The Division

The divisional piece, also cut from $\frac{1}{4}$ in. wood, is $2\frac{1}{4}$ ins. wide, and the interior length of the box. It can be just nailed in place, properly in the middle, of course, but before fixing it, a series of slots must be sawn and cut out. These are shown at (A), the slots being $\frac{1}{4}$ in. wide and $\frac{1}{4}$ in. long. At each side of the box, a strip of wood, $\frac{1}{4}$ in. thick and 1 in. wide, is to be fitted in, also slotted. These are also shown at (A) in Fig. 2.

A saving of time can be had if the strips (A) and divisional piece are clamped together in the vice, and the slots cut through all three at once. The

strips are then nailed to the sides of the box, to stick up above the top edge just $\frac{1}{4}$ in., the same amount as the divisional piece.

These slots are for pieces of wood, cut to the shape given at (B), one for each compartment, and their purpose is to support the cards, preventing them

(Continued foot of page 21)

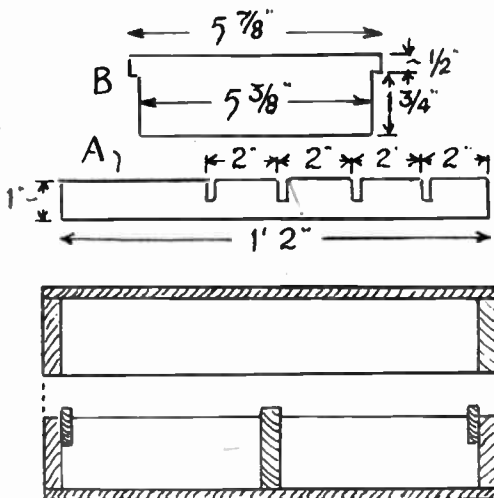


Fig. 2—Interior details

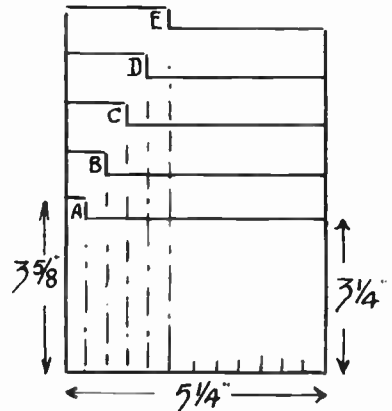
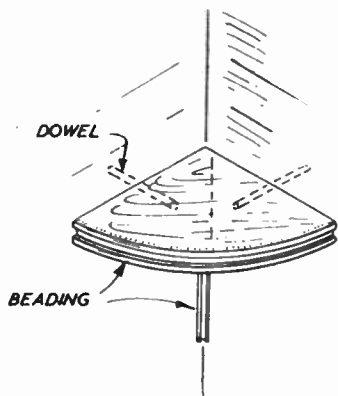


Fig. 3—The method of indexing

There are many uses for this SIMPLE CORNER FITMENT



The completed article

THIS simple fitment is constructed from two pieces of $\frac{3}{8}$ in. ply, or similar material. Two equal sectors are required, of 6 ins. radius, as shown. A complete circle of 6 ins. radius cut out and then quartered will provide material for two fittings.

One sector of a pair is grooved, as shown, this groove being $\frac{1}{4}$ in. wide (or material thickness) and $\frac{1}{4}$ in. deep. One side of the mating sector is then trimmed to fit, as indicated.

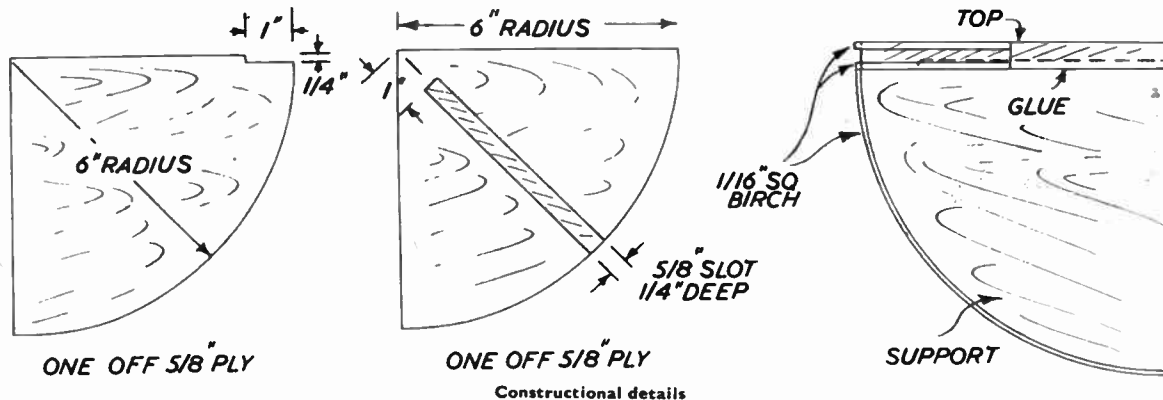
The two sectors glue together to form the final fitting. No screws are necessary, the combination of a grooved and glued joint being sufficient. The appearance of the edges can be improved by gluing on strips of $\frac{1}{8}$ square birch or spruce

which will bend readily to the radius involved. Add these beading strips to both forward edges, i.e., the curved edges of both the top and support. When set, the whole assembly can be glasspapered down thoroughly and then stained and polished.

Mounting

There are various ways of mounting a corner fitment of this type. One method is to use two dowels, making these a plug fit in both wall and fitment, as shown. This is quite satisfactory and completely concealed. For a permanent attachment the dowels may be 'floated' in a setting compound or plastic wood in oversize holes in the wall and glued into the corresponding holes in the fitment.

(218)



Constructional details

Card Index Box—(Continued from page 20)

falling flat down inside. They can be shifted to any slot necessary, as the cards multiply in time. A section across both box and lid, given in Fig. 2 will make the above details clear. Glasspaper the box, especially the sharp corners, and then, if you like, give it a coat of stain and varnish.

The Cards

A series of index cards will be required numbered in alphabetical order, a total of 24 being enough, as the letters X, Y, Z can be on one card, there not being many items likely to be indexed under them. Cut these from cardboard, not too stout, to size given at Fig. 3 and print on each, in the position shown, its own particular letter.

A good way to cut the series, so that the letters are visible behind the cards arranged under their respective index letters, is to lay 12 of them in the way shown, divide the bottom one into 12 equal parts and pencil in the divisions as indicated by the dash and dot lines in the diagram. Five only are shown, but the other seven are treated similarly.

These are lettered A to L, and a second lot, shaped the same, lettered

from M to X, Y, Z. These are placed in the divisions, and the rest pieces (B) fitted behind them. For a start, all 24 cards could be placed in one division. When full up with its complement of hints, etc. which, by the way, are pasted, or written, upon ordinary postcards, they can be divided between the two compartments.

The postcards can be bought as needed, and should measure 5 $\frac{1}{2}$ ins. by 3 $\frac{1}{2}$ ins., a standard present day size. A

Can We Help You?

We are always glad to answer letters of readers, to solve their problems and to offer suggestions, but readers should remember to add their full names and addresses or include a stamped addressed envelope, as it may be impossible to print their replies in these pages in our usual "Replies of Interest" section. Letters should be clearly written and explain fully the nature of the query.

space of about $\frac{1}{4}$ in. should be left free at the top of each card for the title of the hint, or recipe, and the first two letters of each title should be in block letters. The first letter will, of course, indicate the index card it is to be placed under, but, the second letter should be in alphabetical order also.

For example. Suppose the hint is 'how to make a red ink'. This should be titled, 'INK, RED, how to make', and be obviously indexed under the letter (I), but as other subjects accumulate, also under (I), the alphabetical order of the second letter of the title (N), will indicate its place amongst the rest.

It is helpful, in order to find a certain item quickly, to cross index some, but not all. The item INK, RED, for example, could also be copied under the letter (R) for RED INK, but in this case it is unnecessary to duplicate the recipe, it being only necessary to write 'see INK' on the blank card. If the careful collecting of hints and receipts is persevered with, and the little trouble of indexing faithfully followed out, ample repayment will result at crucial moments when the required information is to hand, and no waiting. (210)

When you get near the water HAVE FUN WITH A RAFT

If rafts are used within their capacities they can give quite a lot of good fun, but more must not be expected of them than they can do. Remember, a raft is not a boat and has not the sharp prow and other characteristics which make real vessels readily manageable in currents and winds. Thus, rafts can be easily caught by the flow of a stream, and too vigorous movements on the part of the passenger may cause them to tilt up.

Hours of Sport

But if you accept these limitations, rafts on shallow rivers and ponds, especially if near where you are camping, can give hours of sport, the fun being added to if you are in bathing kit and ready for an occasional plunge.

The simplest possible raft is shown in Fig. 1. This is merely a number of approximately equal-length logs lashed side by side to the cross members (a). The longer the pieces and the more of them used the greater the buoyancy of the final craft. As far as possible use single lengths of cord for the lashings (one to each cross-piece), the cord being taken at the intersection of the members as shown in the inset sketch. This type of lashing is standard for all times

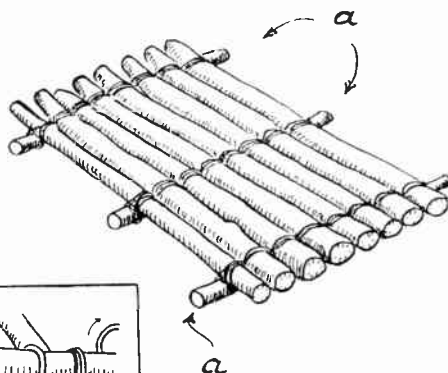
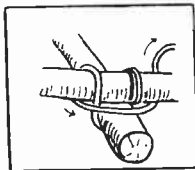


Fig. 1—A simple raft

giving in effect a boat of a width equal to the length of the arm.

Using this method, any fairly heavy log that does not ride too low in the water can be made into a reasonable passenger-carrier as per Fig. 2. Suitable logs can be found about most rivers, having been brought down during seasons of flood, and a good one can generally be discovered by a determined search.

Four spars are required as (A) and the longer these are the more stable will be the log. Also needed is a shorter piece of wood (B) to act as the outrigger

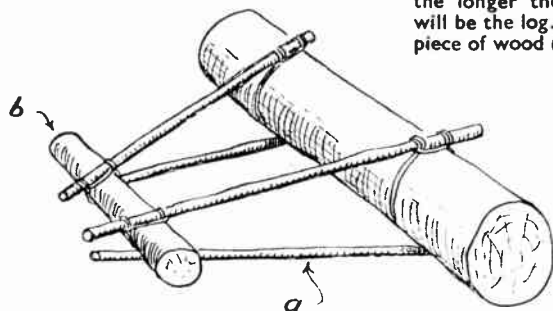


Fig. 2—'Outrigger' type

when spars at right-angles have to be joined, and it is continually cropping up in raft making.

Unless made with heavy logs, this kind of raft rides low in the water and the passenger must balance well in the centre of it and distribute his weight equally. Nevertheless, it can yield much entertainment.

The 'Outrigger'

The floating log was probably man's first idea of a boat, but he was not long in discovering that unless there was some lateral support his vessel rolled over. Thus there came the 'outrigger' that to this day features in many native vessels, which in themselves are little more than hollowed-out tree trunks. The outrigger is an arm protruding from the vessel at right-angles, and having on its end a small float, the arrangement

float. The spars are lashed above and below the main log and float as indicated, the rope being taken right round the bigger pieces and over the smaller in a larger version of the lashing shown in Fig. 1. For holding everything tight, the length of rope which is taken horizontally round the lashings is important in this case.

To complete the raft, a seat can be fastened at a point between the outrigger spars and two blocks of wood secured to the log sides to act as foot rests. This type of raft incidentally falls into the category of the 'Catamaran', a

We hope to publish
Part 2 of this article
next week

high sounding name for a simple means of getting over water.

Use a Barrel

Comic papers always show people floating away in a barrel. But they are not so far from the mark, as a really good raft can be made from a closed barrel of sufficient size, and floating horizontally in the water. The safe weight such a barrel will support can be roughly gauged by multiplying the capacity in gallons by nine, this giving the permissible load in pounds.

The trouble with a barrel alone is, of course, that it rolls over if anyone sits astride it, but this characteristic can be

stopped by fitting with an outrigger frame as shown in Fig. 3. The barrel is kept in position by the lashing (A) which goes right round and is fastened to the cross spars (B). In fitting the frame, adjustment has to be made so that the barrel under load floats at the same level as the outrigger logs. This means that the frame has to be generally lashed at a position higher than the centre of the barrel ends, but every-

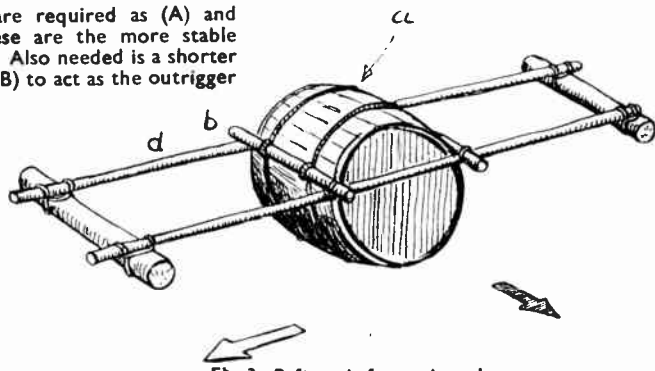


Fig. 3—Raft made from a barrel

thing depends on the size of the barrel.

The long spars (D) are any suitable lengths you can find, but as with the log raft, the longer they are the greater the final stability of your craft. Also, the end floats must not be too small, although the further they are from the barrel the less need be their size.

Although the first feeling with this sort of a craft is to sit astride the barrel and propel it as per the black arrow, more fun can be got by sitting the other way, that is facing one of the floats and putting your feet on a near cross spar. Using a paddle, it is then quite possible to send the raft through the water as per the open arrow. If desired a board could be lashed across the main members just in front of (B) as a foot rest, though if (B) is long enough the ends of this will do quite well for the feet. (106)

(To be continued)

Every child will want this MODEL VACUUM CLEANER

EVERY youngster's delight is to possess a small version of something used by adults, so as to pretend to be 'grown up'. The little model vacuum cleaner shown here is sure to be popular; especially as, at the touch of a switch, it emits a realistic sound indistinguishable by a child from the real thing.

Apart from the small pieces of wood shown in the cutting list, the only other requirements are a small electric buzzer, a torch battery, a small tumbler switch, a piece of stout flex about 3ft. long, and an oddment of leather for the handle. In the writer's case, a small electric bell (the miniature size that can be bought from any electrical stores for a shilling or two) was used for the buzzer. The striker was bent round so that it did not touch the bell but just gave a purring sound when switched on.

The tumbler switch (also miniature size) cost 1/1, and the model was fitted to be operated by a battery of the two-cell type, as this lasts longest before requiring to be replaced. But any other size could, of course, be

screwed permanently on to the sides and which carries the switch, and the other 6ins. by 3 1/2 ins. which is hinged to the first piece as shown. The two sides are 8ins. by 2 1/2 ins. and the two ends 2 1/2 ins. by 2 1/2 ins.

On each end a tapered block is glued to suggest the conical shape of most sweepers of this type. These are sawn out of pieces measuring 3 1/2 ins. by 2 1/2 ins. and 3/4 in. thick, in the manner shown at Fig. 2. Bore one of them through the centre with a hole of the same size as the diameter of the flex to be used.

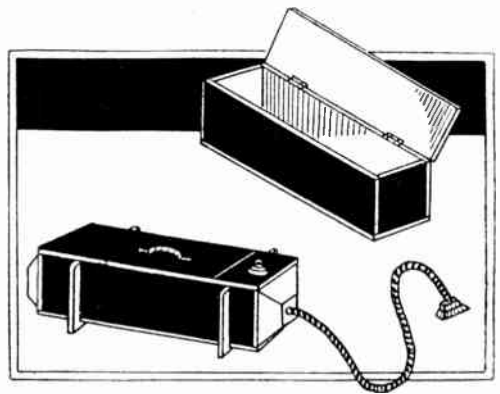
To act as feet and add a little appropriate decoration, two pieces are fretted out as shown at Fig. 3, their corners being nicely rounded off with glasspaper. These are glued round the body of the model about 1in. from the ends, when the other work has been completed.

The Electrical Work

If a two-cell battery is to be used, cut two little wooden stays to hold it in position. One measures 2 1/2 ins. by 3/4 in. wide and is glued across the inside of the case horizontally, at a height of 1 1/2 ins. from the base. The other, which is 1 1/2 ins. by 1 1/2 ins. is fixed with screws to the back side of the case only, in a vertical position. This piece cannot be the full width of the model but tucks behind the brass connection-piece on the top of this type of battery.

Fix the buzzer down to the base of the model with screws, and, after making the necessary holes for the wires, fix the switch on the outside of the fixed part of the lid. Wire up the battery to the buzzer, leading one wire through the switch, and make sure the wires are tight round the battery brasses. For the sake of a little extra trouble a small hole can be made through these brass pieces on the battery, with the drill, then the wires can be threaded through and twisted and no amount of shaking about when the toy is in use can break the connections.

The lid can now be hinged on, and, if desired, a little fastener put at the other end. Though, in the writer's case, he found it necessary to keep inquisitive fingers out of the 'works' with one screw put through this end of the lid, it



being only the work of a moment to take it out occasionally when the battery needs renewing.

Cut a strip of leather about 4ins. by 1in., round off the corners, and fix it to the lid with a nut and bolt through each end, to form a handle. Unless the bolt heads are large, they are likely to be soon pulled through the leather in a child's none-too-gentle hands. So, to prevent this, fit washers between the head of the bolt and the leather. If necessary, these can easily be cut, about 1/2 in. diameter, from a piece of tin or brass—the main thing being to see that they fit the width of the bolt closely and allow no play.

The Head and Flex

The head is shaped from a 2 1/2 in.

CUTTING LIST (for wood of 1/8" thickness except where stated)		
No. of pieces	Description	Size
1	Base	8" x 3 1/2"
1	Top (hinged)	6" x 3 1/2"
1	Top (fixed)	2" x 3 1/2"
2	Sides	8" x 2 1/2"
2	Ends	2 1/2" x 2 1/2"
2	Bands	3 1/2" x 3 1/2"
2	Shaped Ends	3 1/2" x 2 1/2" x 1/4"
1	Battery Stay	2 1/2" x 1 1/2"
1	Battery Stay	1 1/2" x 1 1/2"
1	Head	2 1/2" x 1" x 1"
The Case		
2	Bottom and Lid	12" x 4 1/2"
2	Sides	12" x 4"
2	Ends	4" x 4"

length of 1in. by 1in., and the method of cutting out is shown at Fig. 4. After sawing out, finish off well with glasspaper and bore a hole in the centre, three quarters of the way through, to take the flex.

Alternatively, a short piece of a child's brush could be made up into a head, in place of this. Cut the ends of the flex off neatly and bind them with cotton. Then glue one end firmly into the head and the other into the end of the model.

(Continued foot of page 27)

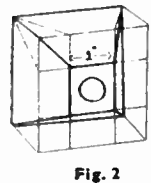
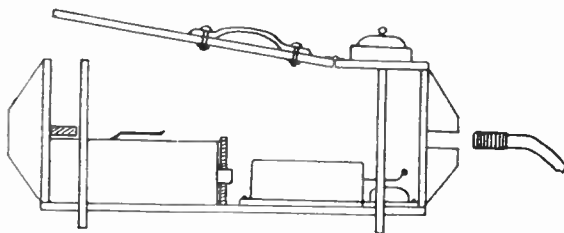


Fig. 2

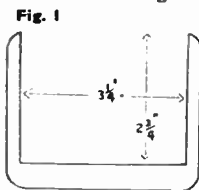


Fig. 3

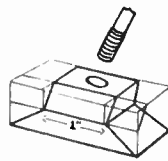


Fig. 4

allowed for. It is a good plan to provide the buzzer and battery before making up the model, and then if any modification in the measurements is necessary to accommodate them, this can be allowed for from the start. Wood of 1/8 in. thickness is allowed for, except the two blocks on the ends which are cut from 3/4 in. stuff, and the vacuum head which is shaped out of a piece of 1in. by 1in.

The general layout of the model is shown at Fig. 1, and from the cutting list it will be seen that the measurements given provide an internal base measurement of 7 1/2 ins. by 2 1/2 ins. Having made sure that this is sufficient to accommodate the buzzer and battery to be used, we can go ahead with the cutting out.

The bottom and top both measure 8ins. by 3 1/2 ins., but the top is in two pieces, one 2ins. by 3 1/2 ins. which is

Have a lot of fun with 'WALKING WILLIE'

MECHANICAL toys are always popular and this will give endless delight to a child. The clown-like figure (illustrated full size at the lower right-hand corner of the panel of drawings on page 31) is placed at the top end of a ramp (Fig. 1), whereupon he walks down (or waddles down), his legs making an intriguing *clack-clack* noise.

Unlike many mechanical toys, the 'works' of the present model are very simple and do not rely on extreme accuracy although the parts should be cut and fitted carefully, especially the feet—of which more in a moment.

The whole job is made of $\frac{3}{8}$ in.

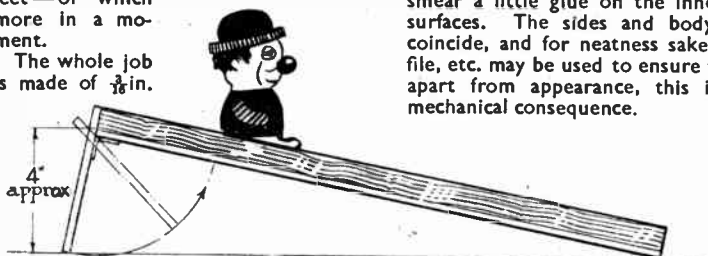


Fig. 1—The complete set-up

ply-wood. The first thing is to get the patterns laid on to the wood. It is possible to paste the pattern right down to the wood as with a normal fretwork design, but this means that only one model can be made from one copy of the pattern, and though most readers will need to make only one of these toys, there are others who may like to make them in quantity.

Quantity

At this time of the year, Christmas is one of the last things we may be thinking of, yet if there be any readers—particularly these with treadle or power fretmachines and who can cut, accurately in quantity—who think of making this toy up in quantity to sell to shopkeepers for the Christmas toy market, they are reminded that the time to approach the Trade is NOT a few weeks before Christmas but early in the year.

For producing in quantity, it is as well to have a template of each part made in, say, thin sheet plastic so that one has only to run a pencil round. The average reader will probably find it best to trace down the design to the wood using carbon typing paper. Note that two sides and two arms are needed.

Note the hole in the side piece and in the leg. These should be marked off and drilled before the wood is cut. To make for clarity of illustration, these holes have been shown rather larger than they really are. A hole drilled with the usual fretwork drill will be suitable.

After cleaning off the 'whiskers' that usually form, give the leg an extra vigorous glasspapering so that it is

slightly thinner than the rest of the other parts.

To assemble, take one of the side pieces and, from behind, insert a thin panel pin. This should have a round section, not oval. This can be hammered in so that the nail projects. Now lay the leg over it. The drawing at the bottom right on page 31 shows the idea. The hole in the leg should be enlarged sufficiently so that it pivots freely on the nail. The other side is then laid on. The hole in this part will enable you to guide the nail in, and hammer taps will do the rest. Before fastening all down, smear a little glue on the inner facing surfaces. The sides and body should coincide, and for neatness sake a wood file, etc. may be used to ensure this, but apart from appearance, this is of no mechanical consequence.

that the feet pieces **MUST** be square with the legs—like an inverted T and in line and in the same plane with each other. Any failure of the model to work properly, can usually be traced to faulty fitting of the feet.

Full size patterns on page 31

It is not a bad idea to prepare the ramp first and then fit the feet to the figure. Quickly test the model, making any adjustments to the feet before the glue has set hard.

Incidentally, the bottom right-hand figure on page 31 is drawn only diagrammatically. The figure, if stood on a flat surface, would stand on the movable leg and lean backwards. The movable leg must not be longer than the fixed one.

However, his place is on the ramp and this is next made. Obtain a length of $\frac{3}{8}$ in. plywood or thick cardboard, 18 ins. long and 2 $\frac{3}{8}$ ins. wide. Along each side of it glue and pin lengths of $\frac{1}{2}$ in. or $\frac{3}{4}$ in. by $\frac{3}{4}$ in. stripwood as shown in the sectional drawing, Fig. 3.

At one end of this shallow trough, fit a strip of plywood 2 $\frac{3}{8}$ ins. wide and approximately 4 $\frac{3}{8}$ ins. long. This is hinged to the underside as shown in Fig. 1 and can be folded under when not in use, as indicated by the chain dotted lines.

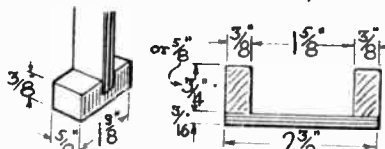
The Great Moment

The great moment has now come to test the model. If all works well and no adjustments are needed, the model can now be coloured. Always use the brightest colours for children's toys—no browns or blue-blacks, for instance. Even the man's bowler hat can be bright green. Why not? For the flesh tint use a little yellow, very little red and a good deal of white, mixed. The nose, of course, is bright red. The hair can be ginger (mix red and yellow). The coat can be bright red. Use bright enamel paints. A preliminary coating of aluminium priming paint will help give a super effect.

The soles of the feet should be left free of paint and can, with advantage, be very slightly roughened. The inner surface of the ramp should not be too smooth. An ordinary wood stain can be used here, though the outside parts of the ramp can be gaily coloured with enamels. (102)

Most Important

What IS most important is for the leg to swing freely, though without undue shake, from side to side. A study of the



before-mentioned sketch will serve to show what is meant. This action can be tested, of course, before the second side is fastened down. Any projecting part of the nail is now cut off and filed smooth. The arms are then glued on, though these can be left until the very end in case it is necessary to take the model to pieces for adjustment.

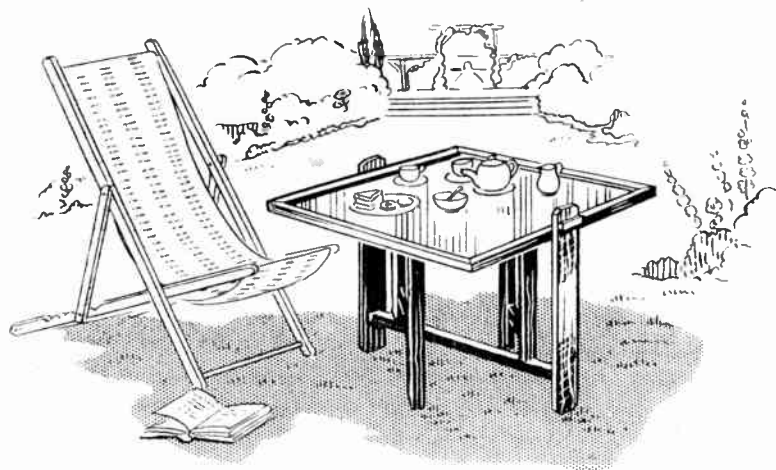
Now prepare the feet. A detail of these appears to the right of the Arms part on page 31 and also in Fig. 2 herewith. Stripwood $\frac{3}{4}$ in. by $\frac{3}{4}$ in. is used, 1 $\frac{1}{2}$ ins. long. A slot is cut with tenon saw and chisel in the middle, as shown, to a depth of $\frac{1}{8}$ in., i.e., half way down. The legs should be a tight fit in these feet slots so that only a small touch of glue is needed to hold them.

It cannot be too strongly emphasised

How to Lock Wood Screws

Where it is desired to lock a wood screw firmly in place in woodwork, the ingenious method here described is well worth a trial. A suitable wire staple is filed down to fit in the slot of the screw and driven into the wood.

Get ready for the summer by making a FOLDING PICNIC TABLE



THE attractive folding table illustrated here is a useful article which can be quickly constructed by the handyman. Anyone who is in the least familiar with light carpentry can make it in a few hours.

The large tray is detachable, and can be carried from the house to the garden, ready laden with the afternoon tea. The stand folds up, and could easily be

also 1in. square, there will be a $\frac{1}{2}$ in. shoulder on each side to butt up to the ends. Trim up the corners of the ends and then glue and nail them to the rails.

The Folding Legs

Two complete folding legs are required and one is shown in Fig. 3, with all the necessary measurements. The material used is $1\frac{1}{2}$ ins. square and the two cross rails are let into the uprights

as shown. Note that the tenons do not go right through.

The short upright is pivoted to the cross members as in Fig. 1, and the position is shown by the dotted lines, and the pivots are clearly indicated. The longer leg is intended, when extended, to support the tray.

The length of the parts are: short upright, 16ins.; long upright, 22ins.; cross rails, 14ins. The joint used is shown in Fig. 4, and the tenons are sunk 1in. into the uprights. Glue and nail the parts firmly together.

Fixing the Legs

The exact position of the pivots is not critical, but about 2ins. to 3ins. from the ends is advised. The folding legs must be placed on opposite sides of the frame, and panel pins about 2ins. long should be used as pivots. Failing these, ordinary nails, or even screws, can be used, providing the hole in the cross member is large enough to allow the screw to swivel.

All that remains to complete the stand is to attach two wooden handles as shown in Fig. 1. These need not protrude far, just sufficient to allow the whole stand to be lifted and moved when extended. Alternatively, a pair of

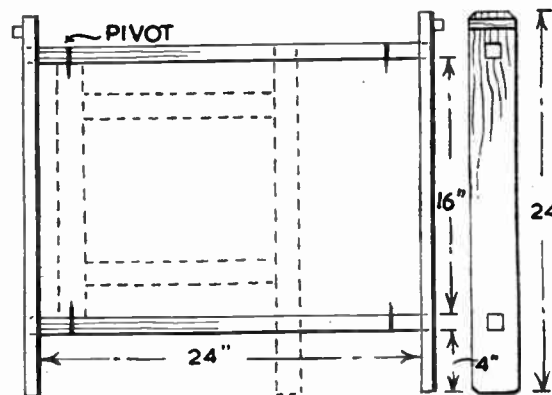


Fig. 1—Details of the frame

stowed in a car for a picnic in the country.

Making the Frame

You will see in Fig. 1 that the frame is constructed of four pieces. The two ends are cut from $\frac{3}{4}$ in. material and are 24ins. long by 3ins. wide. The cross rails are cut from slightly heavier material (we have indicated 1in. thick), and are 25 $\frac{1}{2}$ ins. long by 2ins. wide.

These rails must be tenoned into the ends, and Fig. 2 shows exactly how this is done. The mortises in the ends are 1in. square, and the positions are shown in Fig. 1. Since the tenons on the rails

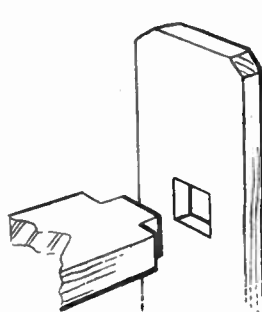


Fig. 2—How the rails are tenoned into the ends

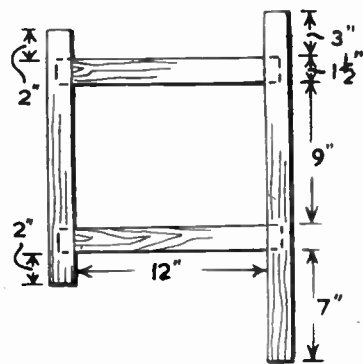


Fig. 3—Dimensions for the folding legs

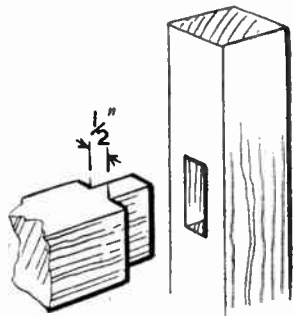


Fig. 4—The joint used for the legs

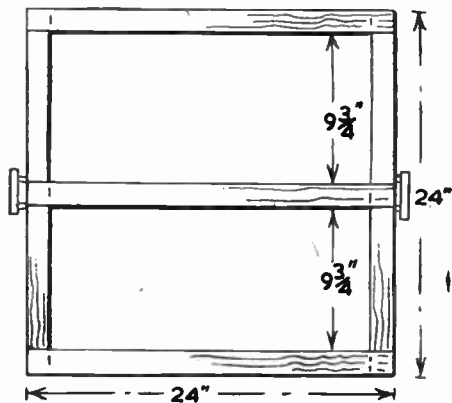


Fig. 5—The framework of the tray

modern handles could be fitted and could match those on the tray.

The Tray

It may be that an existing tray will be used, in which case you may turn to the end of the instructions and see how to finish the stand by painting. If no tray large enough is available, the following notes will show you how to make one at a reasonable cost.

The diagram in Fig. 5 gives the measurements and the positions of the various parts of the framework. Five pieces are required, each measuring 24ins. by 1½ins. to 2ins., and ½in. thick. All five pieces are halved together, the exact nature of the halving joints being shown in Fig. 6.

The method of marking out is to lay the pieces on the floor or work bench, in the correct position, the cross pieces resting on the ends. Use a set square or T square to true them up, and mark the halving joints with a sharp pencil. Saw along the lines to half the depth of the wood and chisel away the unwanted portion, leaving the joints as shown in Fig. 6.

Do this work carefully because the frame must be strong enough to prevent the finished tray from warping. The parts should be assembled with glue and ½in. countersunk screws.

The next operation is to cover the frame. Here we have a choice of several materials, and we leave the reader to decide which he can most easily obtain. Plywood, of course, is ideal, but it may

be difficult to obtain. Hardboard is also suitable and can be obtained in various thicknesses and finishes. The most suitable would be about ⅜in. or ½in. thick. A visit to a local builder or builders' merchant might produce a scrap piece large enough for the purpose.

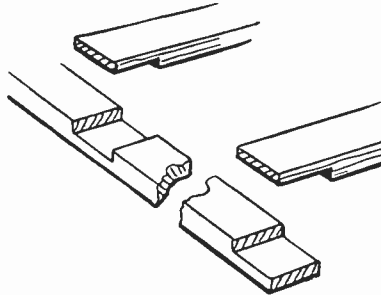


Fig. 6—Halving joints for the tray frame

Finally, we suggest metal. There are several firms who advertise sheet aluminium, for caravans, etc. and this would make a smart tray indeed. When polished, it not only looks well but is easily kept clean.

The finished tray will look neater if the covering can be obtained in one piece, but if it is necessary to make it of two or more pieces you must pay particular attention to the joints. See that they fit exactly before screwing to the frame.

After the covering has been fixed securely in place, the narrow strips

shown in Fig. 7 can be screwed or nailed down. The strips should be about ½in. by ½in. section and can be bought ready-made in the form of stripwood. The corners should be neatly mitred as shown in the cut-away diagram in Fig. 7. A pair of fancy handles screwed in place will complete the large and handy tray.

Painting

For use as a picnic table, the piece

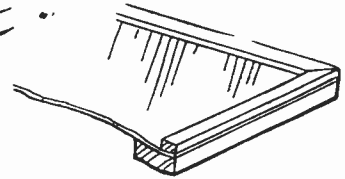


Fig. 7—Method of edging the tray

would best be preserved by enamel. If it is likely to be subject to rough usage, it is the work of only a few moments to give it a fresh coat. A bright colour should be used, say, blue or green. A colourful picture of flowers could be cut from a magazine and pasted in the centre of the tray and the whole thing varnished over.

Clean the work thoroughly with glasspaper, and apply two thin coats of enamel. If you have any wood filler handy, this should, of course, be applied first, rubbing it well into the wood to fill the grain. (214)

Add a Garden to the Doll's House

MUCH improvement can be made to a doll's house, and its amusement value increased by adding a permanently attached garden with summer house, toolshed, swings, clothes line and other familiar garden objects which can be much fun in the making.

The only essential materials consist of wood to make a baseboard a few inches wider than the house and three or four times its length, and some oddments of scrap wood of almost any shape and size, and, perhaps, a few pieces of tin, strong cardboard, string, screws and glue.

The house need not be attached to the baseboard until after the garden has been completed, but the position it is to fill should be clearly marked in pencil. Some care is needed to ensure that the garden objects, buildings and fittings are in proportion to each other and the house. It would be ludicrous for example to have a dog kennel as big as a door of the house or a toolshed the same height as the bedroom windows.

Individual ingenuity and ideas can be freely used in the nature and extent of the garden 'fitments', but some that can be simply made are:

See-saw, swings, greenhouse, summer house, dustbin, chicken-hut and run, sun dial, bird bath, toolshed,

pergola, garden seats, clothes posts (complete with line, pieces of cloth as washing, miniature clothes pegs and prop to hold the line), rabbit hutch, dog kennel, and deck chairs.

When the fittings have been completed and fixed to their appointed places on the baseboard, there is still scope in making or buying miniature garden tools such as a wheelbarrow and roller to put around the garden when the young owner is at play and to return to the garden shed when the

house is put away for the night.

Little figures or dolls can be bought to sit on the swing, in the summer house or in the deck chair. The base should be painted to show paths lawn and flower and vegetable beds. With odd twigs or pieces of brushwood of the right size, trees can be added, and, in the same manner, a hedge can be glued round the baseboard or a wooden fence constructed according to choice. The 'trees' should be 'planted' in the same way as some other fittings can be secured, by boring holes in the baseboard of sufficient size to take the rounded off and tapered pieces tightly. With a little glue in the holes, they will be immovable.

No definite thickness need be stipulated for the baseboard. It should, however, be sufficiently strong to carry the weight of the furnished house if it is to be moved about, and thick enough for holes to be bored to take uprights such as the swings and clothes posts. Wood ½in. is adequate.

It will be found helpful to make a full scale plan of the garden layout on a large piece of paper before any fixing is attempted. Back gardens offer the greatest possibilities, but another at the front of the house will be an improvement and simply entail the use of a larger baseboard. (220)

A THIRSTY JOB!

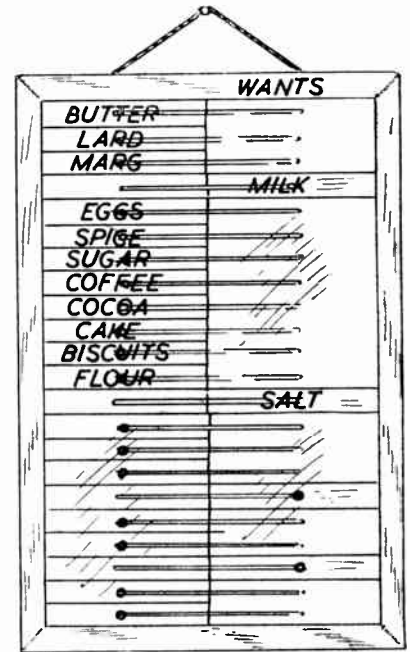
The London Chamber of Commerce have received a letter from Mr. J. Boehringer, of 3555 Idlewild Ave., Cincinnati 7, Ohio, U.S.A., whose hobby is collecting beer bottle labels. Mr. Boehringer wishes to get into touch with people in this country who have a similar hobby. No doubt there is at least one among our readers who saves such labels—if only as happy reminders!—and Mr. Boehringer is waiting to hear from him. So get pen to paper right away.

The housewife will appreciate this KITCHEN MEMO

CONSTRUCTION of this 'housewife's aid' is very simple. A piece of $\frac{3}{16}$ ply, 4ins. by 6ins. forms the back and a piece of $\frac{1}{16}$ celluloid or similar transparent plastic of the same dimensions serves as the front. The remainder of the material is then cut from $\frac{1}{4}$ in. by $\frac{1}{16}$ in. birch or spruce hardwood strip.

These are then assembled in the frame and the celluloid front lightly glued in place (Fig. 5). On this is built up a second frame, again of $\frac{1}{4}$ in. by $\frac{1}{16}$ in. material, to complete the assembly. The whole can be secured with woodscrews, screwed in from the back where they will not show.

Each name plate then requires a small 'handle' protruding through its re-



The completed memo

a small screw eye. The object of the handle is that each name plate can be slid from one side of the assembly to the other.

The right hand 'column' represents the 'wants'. Normally, all the name plates are on the left. When the housewife notes that stocks of any particular item are low she simply slides that

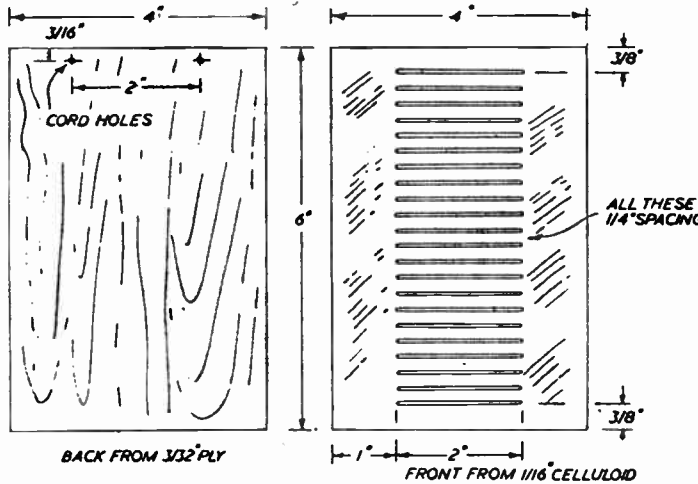


Fig. 1

Fig. 2

Cut out the backboard as shown in Fig. 1, drilling two holes for the hanging cord. Tie this in place. The celluloid front is marked out to the same overall dimensions but must also be given a row of horizontal slots, approximately $\frac{1}{16}$ in. wide, as shown. These slots are each 2ins. long and spaced at $\frac{1}{4}$ in. vertical intervals (Fig. 2).

The best way to cut these slots is to mark out their position on the celluloid sheet and then drill each end with a $\frac{1}{16}$ in. diameter hole. Each slot can then be filed, sawn or cut out between these end holes. A sharp knife will probably give the cleanest result.

The complete memo tablet is then assembled as follows. First build up a frame of $\frac{1}{4}$ in. by $\frac{1}{16}$ in. material around the ply base, as shown in Fig. 3. Glue this frame in place. Twenty-two pieces of $\frac{1}{4}$ in. by $\frac{1}{16}$ in. material should then be cut, each $1\frac{1}{2}$ ins. long (Fig. 4). On these must be written or printed the names of the usual kitchen commodities. Each piece, too, should be glasspapered smooth and reduced to slightly under $\frac{1}{16}$ in. true width.

spective slot in the celluloid face. Slide and shake all the name plates to the left hand side, and tack into each one a small brad with a well rounded head, or even



Fig. 4

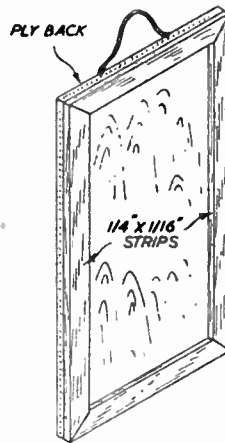


Fig. 3

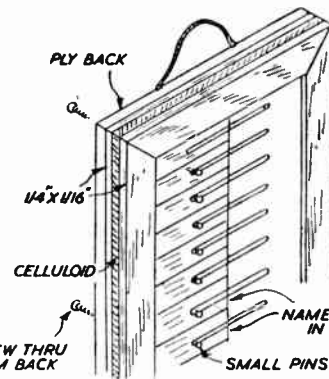


Fig. 5

respective name plate to the right hand side of the memo, as a reminder for when next she prepares her shopping list. (215)

Model Vacuum Cleaner—(Continued from page 23)

The most realistic finish is given to the model if black enamel is used, with appropriate pieces picked out in silver. If wood permits, a special case in which the child can pack away the toy is

greatly appreciated, and does not take long to make up. Measurements for the six pieces to make a case on the same scale as our model are, therefore,

included in the cutting list. Fix a strong fastener on the front and then finish off the case with the same black enamel. (105)

Experiments with Potassium Ferrocyanide in HOME CHEMISTRY

THE large yellow crystals of this salt are made by fusing together potassium carbonate, iron and animal matter, such as horns, hooves and scrap hides; extracting the mass with water and evaporating the solution. In medicine, it was once used as an aperient, and to the chemist it is valuable in being the starting point for preparing cyanogen compounds, as well as giving him a good test for iron.

Prussian Blue

In most water colour boxes you will find Prussian blue. Its chemical name is ferric ferrocyanide. To prepare it, mix solutions of potassium ferrocyanide and ferric chloride, when it falls as a deep blue precipitate. Wash the precipitate with large volumes of water by decantation in a big bottle, until the wash waters no longer give a turbidity when a portion is tested with silver nitrate solution.

When the precipitate has settled, pour off the clear liquid above and divide the thick blue sludge into three parts. Filter off one and dry it in the oven. The Prussian blue shrinks into lumps much resembling indigo, and even has the same bronzy lustre. To make the water colour you need merely grind a little with a few drops of glycerine.

By means of Prussian blue we can make other soluble ferrocyanides, such as sodium ferrocyanide. Put the second portion of your Prussian blue sludge into a flask, dilute it a little if it is thick, and bring to the boil. Now add a little sodium hydroxide solution. The colour of the precipitate will become more drab. Continue boiling and adding small quantities of sodium hydroxide solution, until the Prussian blue has become red-brown.

Filter the solution hot and evaporate to the crystallisation point (to ascertain this, dip a glass rod into the hot solution. Yellow crystals will form as the rod cools, if the right point has been reached). On cooling, fine yellow crystals of sodium ferrocyanide will separate out. Let the solution stand overnight for maximum crystallisation to take place, pour off the mother liquor and drain the crystals on a clean porous tile or brick.

The red-brown sludge you filtered off is ferric hydroxide, and with it we can make an unusual variety of ferric oxide.

Wash it out of the funnel into a large bottle, as shown in Fig. 1. By means of a jet of water from the wash bottle and by revolving the tilted funnel, every particle of the precipitate is quickly and cleanly transferred to the bottle. Now wash the precipitate in the same way as for Prussian blue, testing the wash water this time with copper sulphate solution until no further turbidity is produced. Filter off the ferric hydroxide and dry the paper and precipitate on a saucer in the oven.

Now heat the dry product in a crucible. It will give off water and be converted into a black or steel-grey powder, consisting of ferric oxide. This oxide is normally red-brown and similar in appearance to the hydroxide.

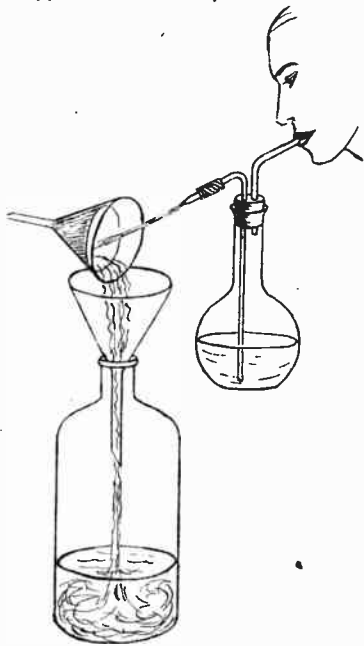


Fig. 1—Transferring a precipitate

With the third portion of the Prussian blue we can make mercuric cyanide, and from this in turn, the gas cyanogen. To make the mercuric cyanide you will need some freshly precipitated mercuric oxide; you can obtain this by mixing solutions of sodium hydroxide and mercuric chloride, when it separates as an insoluble yellow powder. Wash it by decantation until the wash waters give no precipitate with silver nitrate.

Boil the mercuric oxide suspension and add small portions of Prussian blue sludge. The sludge slowly becomes brown (this, too, is ferric hydroxide). When a portion remains blue, filter hot and evaporate to the crystallisation point, when colourless crystals of mercuric cyanide separate. Dry these by draining on a porous tile.

Ignition Tube

Now fit up a small ignition tube with a cork and a short length of narrow glass tubing, as shown in Fig. 2. Place as much mercuric cyanide as will cover a sixpence in the uncorked tube and heat it. Place the tip of your forefinger loosely over the tube's mouth and in a few moments smell your finger. The odour of the gas resembles bitter almonds. Now put the cork and tube in the mouth of the ignition tube, heat again and then apply a light to the piece of narrow tubing. The gas will take fire and burn with a splendid mauve-coloured flame.

Potassium ferrocyanide was once widely used by dyers and calico printers to produce shades of blue. Take a small piece of clean white cotton material and

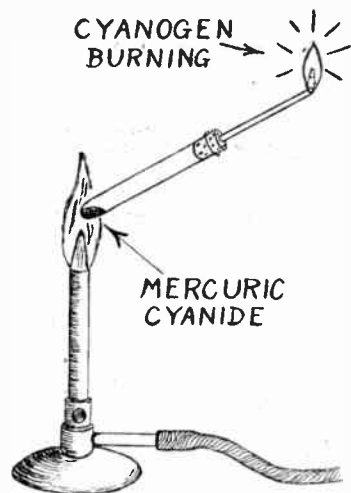


Fig. 2—Making cyanogen

boil it a few minutes in ferric chloride solution, wring it out and put it into a boiling solution of potassium ferrocyanide. The cloth will be dyed blue— with Prussian blue.

Wash the cloth in several changes of water and cut it into two pieces. Wring them almost dry and put one into potassium hydroxide solution. The blue colour will disappear and be replaced by a pleasing orange-buff shade. Wash it well and after drying both pieces of cotton, gum them in your laboratory note book as specimens. You can, of course, produce darker or lighter shades by varying the strength of your solutions. (206)

Why not make a Spirit Lamp?

Those who enjoy home chemistry, will probably find a small spirit lamp useful in some of their experiments where a gentle heat is required. Such a lamp can be made quite easily from an old ink bottle. Bore a hole through the cork, and pass a tin tube through the hole. Then pass a wick through the tube, fill the bottle with methylated spirit, and the lamp is ready for use.

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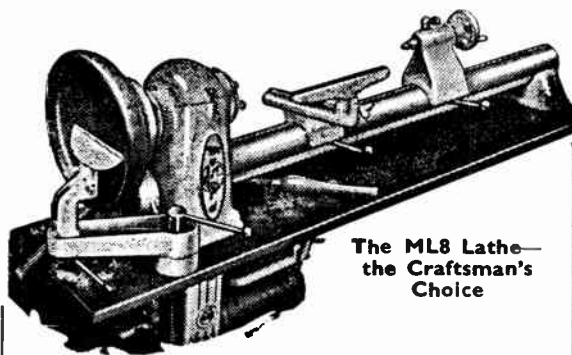


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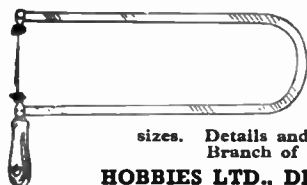
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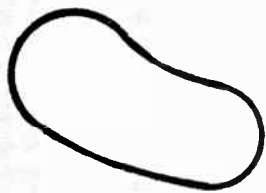
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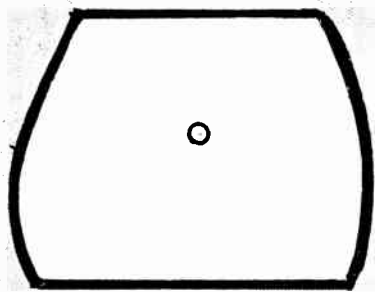
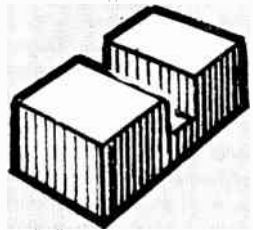
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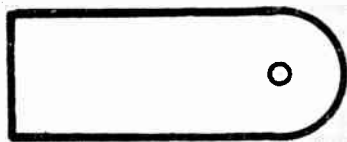
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