Hobbies WEEKLY

CONTENTS

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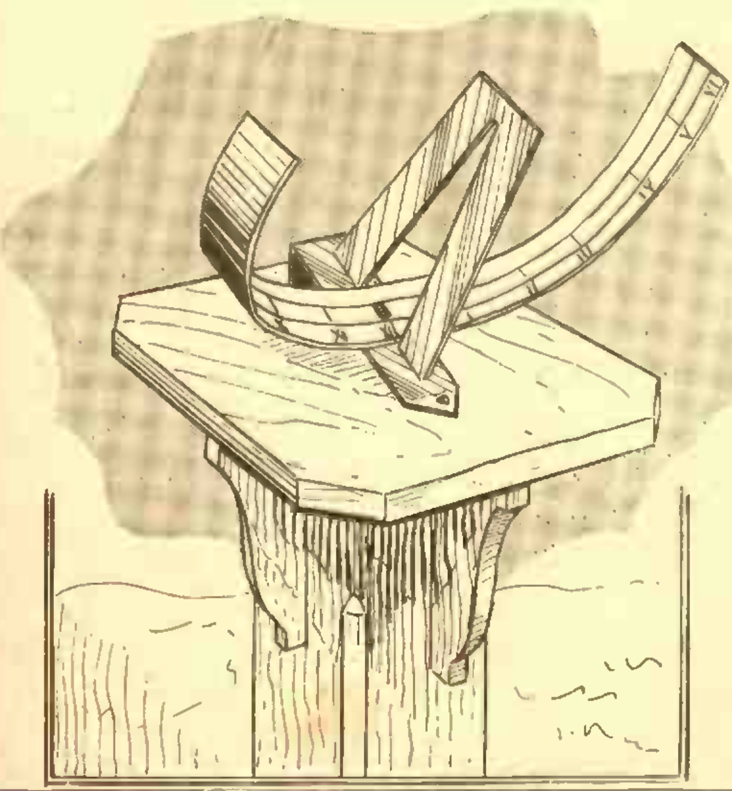
A NOVEL SUNDIAL

THIS pattern of sundial is quite a novelty in the garden to those used to the more conventional form. It is made entirely of metal, and is easy to construct if the instructions are carefully followed out. For preference the metal used should be brass, but some of the aluminium alloy now obtainable, would serve if not too thin. Considering the design, a sheet metal of 1/16in. to ⅛in. should be employed, certainly nothing thinner, as it would likely be distorted too easily if struck or bumped against.

The parts required are grouped together under Fig. 1. The dial, A, should be cut from the metal to the length given, plus a little extra for trimming, and is marked off while flat and afterwards bent to a semi-circle of 4ins. radius.

For accuracy in bending, a wood shape should be marked out and cut, as in Fig. 2. Do not waste good wood for this, any piece of common box wood will do for it, but the sawn edge, curved part, must be cut square across, and the whole true to size.



Strip Marking

It would be a good plan to cut this first, then to lay a strip of paper round the edge, marking the exact distance, and so obtain an accurate length for the brass dial. Down the centre of the metal dial strip scratch two lines, ½in. apart, deeply. This job could be done with an ordinary marking gauge, being repeated several times until the lines are deep enough.

Find the centre of the strip, and there drill a hole for a small screw bolt for subsequent fixing. Across here scratch in two lines, the thickness of the metal apart, and each side of these divide the remainder into six equal divisions and scratch these across. These scratched lines must be deep, and a good tool to employ for the purpose is the tang end of a file, using as a guide to straightness, a steel rule

Hour Numerals

The hour numerals can then be put in, Roman figures being best as these, consisting of straight lines, are easier to scratch in than other figures. Of course, readers able to do a little simple engraving, will be able to do this work with proper engraving tools and make a better job, doubtless. The markings can also be etched in with acid, if preferred.

The metal is then most carefully bent to a semi-circle round the wooden former, until it fits the curve closely. If an accurate measurement as to length was obtained, the metal should be an accurate fit round the curve, but should any stick up above the flat edge, file it off level.

The Base

The base portion, to which the dial is to be fixed, is shown in the flat at B, and should be marked on the sheet metal, and cut out. A satisfactory method here, at least to the amateur not particularly experienced in scribing a pattern on

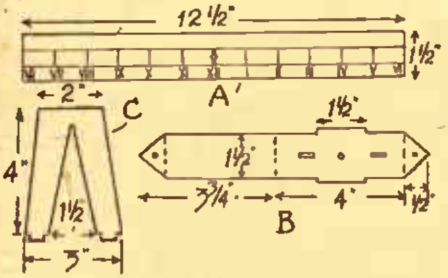


Fig. 1—Group of the parts needed

metal, is to draw it on thin paper and gum it down to the sheet brass; after cutting out, the paper can be easily removed with hot water.

Referring back again to the pattern, B, in the centre of the 4in. portion drill a hole for the screw bolt to go through which secures the dial to it. The side projections shown in the diagram, are slightly less than ½in. Ignore the two small slots for the moment. Trim the ends to a point and drill holes for fixing screws in them. Having progressed so far, bend up the side projections. Now try the dial in place, fitting it across with the small brass bolt and nut referred to.

Here a little filing of the raised up projections may be required, as they should only be high enough, to make a snug fit to the curve of the dial strip, as shown at E, in Fig. 3. This being satis-

Fig. 2—The wooden former

Fig. 3—The metal parts

factory, mark out and cut from the metal the gnomon, C, in Fig. 1.

This might be scribed direct on the metal, as the shape is a simple one. Cut the metal to the height of the 4ins. given, plus ½in. at the bottom for the fixing extensions. These are ½in. long.

The gnomon should then be placed over the centre of the dial, and where the bottom extension pieces touch the base part scribe round carefully. These should be cut out, and the gnomon should fit in them closely, and no side play, also they must be exactly central—make no mistake about this.

Central and Vertical

In fact, no mistake is likely if the slots are truly in line with the fixing screw in the centre. Now remove both dial and gnomon temporarily, while the base part is bent to shape.

As a sure guide here, draw the shape shown at D, Fig. 3, the back part being erect and the front part at an angle—the angle of latitude of the Town the reader resides in. In London, this is 51½ degrees.

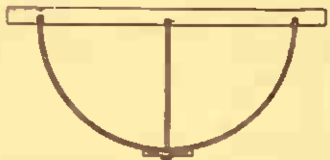


Fig. 4—Guide for vertical gnomon

other places can be got from an atlas. Bend carefully, and compare with the drawing until the angle is correct. When right, refix the dial, and slip the gnomon in place. The latter is now to be permanently fitted in with solder.

As the gnomon must not only be in the centre of the dial, but truly vertical, a guide should be made to ensure it. This is shown in diagram Fig. 4, being a strip of spare wood, about 1in. wide and ½in. thick. Lay the ends of the dial on this strip of wood, and mark their position on it. At the places marked make saw kerfs across, or narrow grooves, according to the thickness of metal, to fit the ends closely in. A depth of about ½in. will be deep enough. Exactly in the middle of these grooves make a third to receive the top edge of the gnomon.

A Soldered Joint

Fit in, as in Fig. 4, and turn over. The help of a friend will be necessary here to hold all firm while the soldering is being done. Clean the metal projections of the gnomon, appearing through the underside of the base part, and solder round. Be generous with the solder, putting enough on to form a solid fillet all round. This should make a sufficiently firm joint. Clean the joint and turn the sundial right side up.

Lay a straightedge across the tips of the dial, and see if the top edge of the gnomon is level with them. If not, trim or file off any surplus. Clean up the metal, and to make the numerals and hour lines clearer, rub in a paste of white lead and boiled linseed oil, or a little thick white paint if available. Clean off the surplus, enough should still remain in the lines to render them particularly legible.

The sundial is now screwed to a suitable pillar, the dial facing S., and the back of the base part pointing N., of course. Sufficient accuracy can be obtained from a compass here, and if a line, true N. and S. is drawn across the top of the pillar, the base part can be screwed over it, and accuracy reasonably ensured.

One of Our Loyal Readers

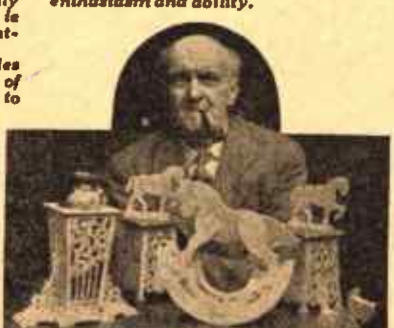
A TRIBUTE to the value of hobbies generally and Hobbies Weekly in particular was paid recently by somebody who should be able to appreciate them. He is Mr. W. Sutton, of Erdington, Birmingham, who has followed Hobbies from its very start and has become more and more enthusiastic as years advanced. His cheery letter and words of encouragement are the type which are gratefully received by those who endeavour to help others in providing practical pastimes with which to keep hand and mind usefully employed. Among other things Mr. Sutton remarks, "It is at times like these that men like myself feel very thankful that we, in our younger days, took to having a hobby. Truly, Blessed is the man who hath an hobby, let it be what it will. If only the mind and thought could be arrested into higher aims in life, I think some would realise the joys we old hobbyites had, say, fifty years ago. Certainly there was not the leisure as there is today, but amid it all we had contentment.

In the Christmas No. 1948 of Hobbies Weekly it was very inspiring to read of the Thanksgiving Service; it goes to prove the inspiration of those in authority. They certainly do not put the prosperity and protection down to their own powers, but realise that one greater than man was behind their efforts.

One cannot help but notice the trend of the times by the designs given from time to time. Model and toy making seem to be very prominent today. Is it because any wood will do, or is it that this present generation have no desire for art? Even chip carving has gone. It's a great pity that these old arts and crafts should have to take a second place in a modern world.

I wish I had the ability and means to teach the youth of today, and help them to realise every moment is precious. As we reach the three score years and ten one cannot help but realise the countless blessings we, in our younger days enjoyed".

We are always pleased to hear from our readers, and delighted with the friendly spirit of most letters. The remarks of Mr. Sutton may not meet the approval of some of our other readers, but at least we can respect and acknowledge their obvious sincerity. There is not the slightest doubt idle hands and mind are apt to breed discontent and boredom, and full happiness can be best found by having something to do, and doing it with interest, enthusiasm and ability.



Usefulness and attractiveness are combined in this RUSTIC TREE-SEAT

A READER writes, telling us he has a tree at the side of his lawn round which he wants to make a seat. He asks for general dimensions and details of construction of either an octagonal shaped seat, or a plain four-sided or square one. He does not mention the diameter of the trunk of the tree, but the construction should, nevertheless, not be influenced greatly, providing the tree is not too small, and providing always the lower branches are 6ft. or 7ft. above ground level.

While an octagonal seat is much to be preferred in appearance to a square one, the latter, we think, is simpler in construction as it does not contain any irregular mitre cutting as an octagonal one does. There may be others interested in the same suggestion so we here describe a seat round a tree of about 12ins. diameter.

Suitable Timber

The construction of this tree-seat allows for the free growth of the tree, and, it will be noted from the sectional view, Fig. 1, that no upright seat supports are driven into the ground near the roots of the tree. The back supports rest on a sole-plate of squared wood frame which is just let-in the surface of the soil.

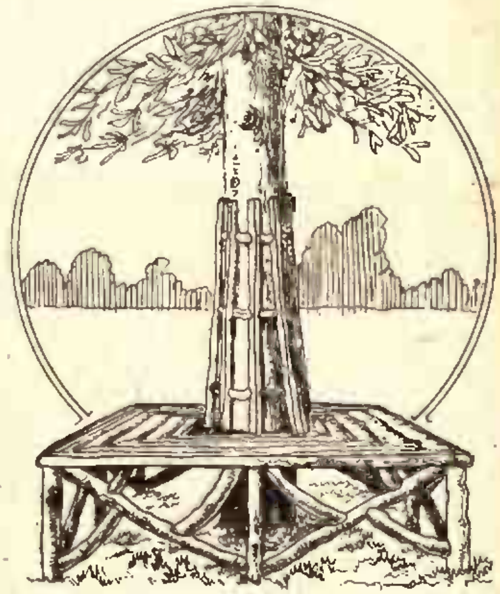
Rough-sawn timber may be used throughout for the general seat formation, branch wood fairly straight and about 3ins. to 4ins. in diameter being chosen for the main support pieces. Thinner branch wood is suitable for the seat and its back support. Regarding the latter, it is not at all compulsory to include this, but it does, however, add greatly to the appearance and to the restfulness of the seat.

Seat Plan

Fig. 2 gives a plan, of the seat, the right-hand side of which is looking down upon the seat itself, and showing one section only of the sloping back. The left-hand half of the plan gives the seat supports and uprights.

The first part to construct will be the sole plate, and the overall size of this is determined by first measuring the trunk of the tree at ground level and allowing 1in. inside all round for level clearance. Stuff about 3ins. by 1½ins. in section would answer well and the ends of the four pieces must be halved down, as shown in the detail, Fig. 3, to make a flat and level plate. The pieces should be creosoted or painted over with some wood preservative before they are nailed together.

Upon this frame, at each corner of it, and also in the centre of each piece, erect a back supporting post of round timber (if this wood is to hand) about 15ins. long. One end of each piece must be sawn off square, while the other end is cut to form a slotted halving joint ready to receive the end of the cross bearer, as seen in Fig. 4.



When the slots have been cut, nail the eight uprights to the sole plate with long and wide cut iron nails. These nails should be driven in on the slope, and it is found an advantage to bore holes for the nails for about 1in. or so deep. It is thus possible to get the correct amount of slope for the nail to fix both post and plate securely together.

Joints

From the left-hand plan, Fig. 2, note how the slots must be arranged before actually nailing the posts to the plate. Let the slots of the corner posts lie at 45 degrees and the slots of the intermediate posts lie at right angles, all slots being in line ready to link up with those on the outer ring of posts which are also slotted at the top (see Fig. 4). These outer posts, again eight in number, are about 21ins. long, and similar in diameter to the inner ones. They must be pointed at the lower ends for driving into the ground to a depth of about 6ins.

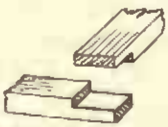


Fig. 3—The flat joint

Post Fitting

Prepare holes for these posts and drive them in, keeping them always upright and lodging a piece of wood on the top of each while using the mallet so as not to damage the slotted top. It will, of course, be understood that before the outer ring of posts can be put in, the proper position for them will be carefully set out on the ground.

The seat bearers are next prepared. These are of round timber, but with a "flat" planed off on each to form a wide bearing for the seat slats, shown in the top diagram in Fig. 4. The ends of the bearers are cut to a tenon to fit the uprights and each is secured either by nailing or by first boring and then driving in hard wood dowel pins.

In preparing the bearers, those coming at the angles of the seat will be longer than the intermediate ones. If the seat

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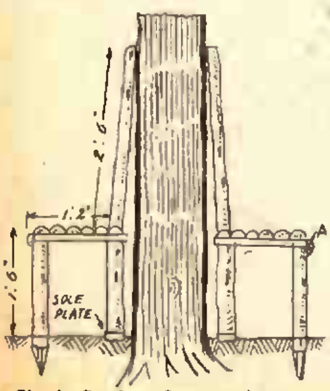


Fig. 1—Section of tree and seat

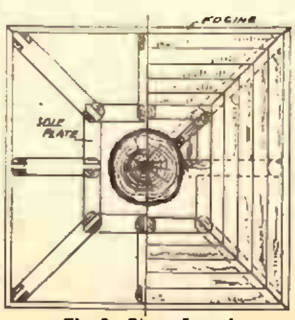


Fig. 2—Plan of seating

Fig. 6—Tree frame

Fig. 4—Post joints

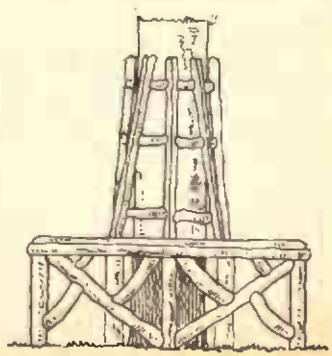
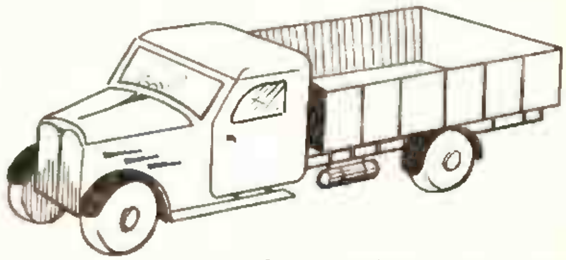


Fig. 5—Framework below seat

For an addition to your earlier models you should make this

MINIATURE G.S. LORRY

THE general service lorry explained here is in keeping with other types suggested in previous articles, for miniature models easy to make from thin card, odd wire, etc. This lorry, like the others, is suitable for use on a railway lay-out, aerodrome or any large model. It is designed so all parts could be mass produced if you wished to make them in a series. The writer has worked this scheme out for an Exhibition lay-out and it was quite successful. Full size layout of certain parts and their positions are given below.



Chassis

Chassis framework is exactly as we had in the first vehicle of this series. It is made from obechi stripwood size 3/16in. by $\frac{1}{8}$in. and length is $4\frac{1}{2}$ins. with the ends sloped off. Follow carefully the drawings at Fig. 1 where drawings are full size. Cross braces can be of similar wood and measure 11/16in. wide. Balsa cement is a good adhesive but if you force in small "Lil" pins as well and snip off the tops, this will bind the framework better.

To take the base of van make six bearers $1\frac{3}{8}$ins. wide and 3/16in. by $\frac{1}{8}$in. Space out as shown in Fig. 2, and fix on the narrowest way up. These should be spaced out to a distance of 3ins. and slightly rounded off at the ends.

Van Floor

The base of the van, measuring 3ins. by $1\frac{3}{8}$ ins., can be made from stiff card or thin plywood, but as it is well reinforced with the sides, card will do admirably. Now cut the two long sides which will be 3ins. long by $\frac{5}{8}$in. high. A good thickness for this is about 1/16in. Some vans have a higher side but this is up to the builder. Most lorries have some form of struts up the side as shown in Fig. 3 and you can add these before assembly.

You will now require two short ends from the same type of wood, and these will be $\frac{5}{8}$in. high and $1\frac{1}{4}$ins. wide. Check the measurement before cutting to see that the part fits. If you use a different width on the sides this will alter this measurement. Assemble all parts, see that these are correct, and then mount on the bearers.

Now for the cabin. Again using 1/16in. wood you can make the floor $1\frac{1}{4}$ins. wide by $1\frac{3}{16}$ins. Next make the back size $1\frac{1}{4}$ins. by $1\frac{3}{16}$ins. wide with a small window, shown in Fig. 4. Two sides can now be cut size $1\frac{1}{4}$ins. high by $1\frac{1}{4}$ins. deep and from a point $\frac{3}{4}$in. from base this is sloped off to provide a staggered driving mirror. Note the suggested cut-out of the window, seen in Fig. 5.

The front is made in two sections to allow for slope. The base lower portion is $1\frac{1}{4}$ins. by $\frac{3}{4}$in., as in Fig. 6, up to the dotted line. Carefully check the measurements and then make the upper front panel (from Fig. 6), with the driving window cut out to measure

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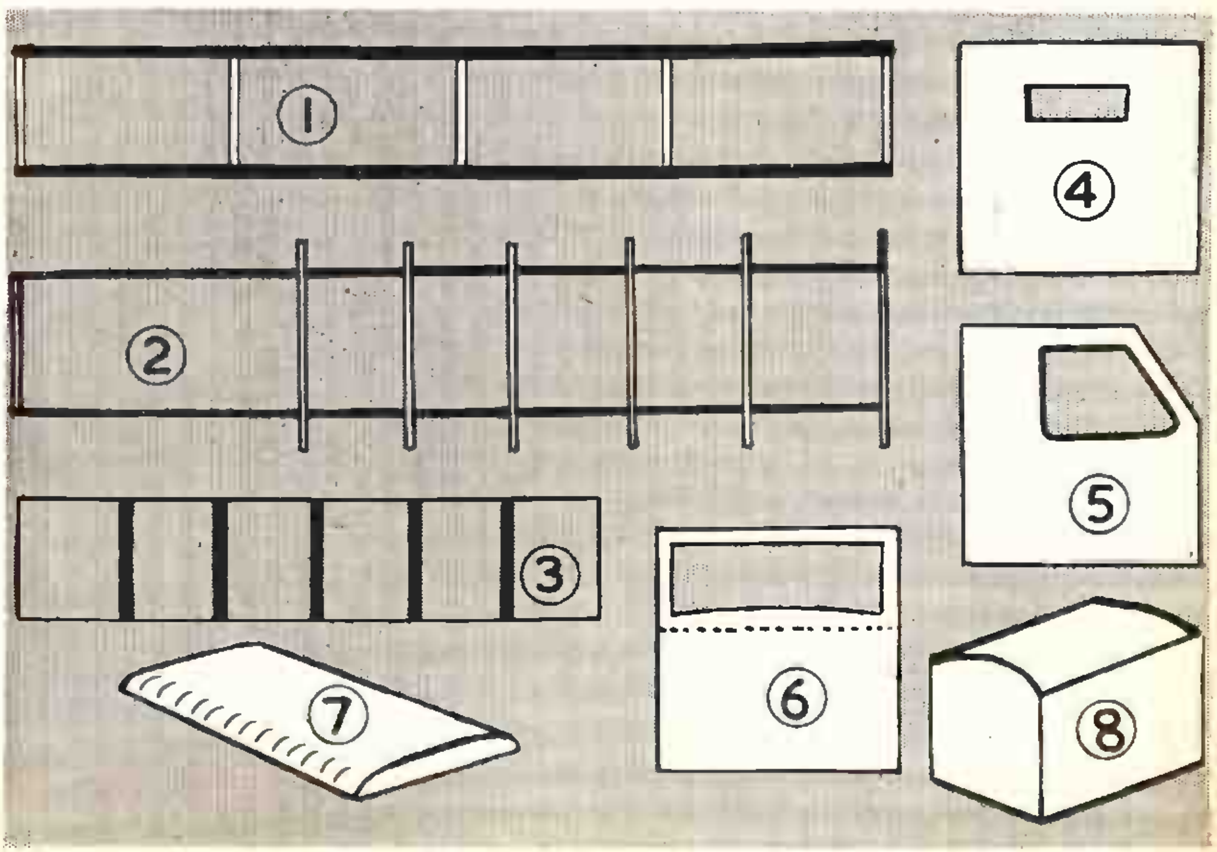
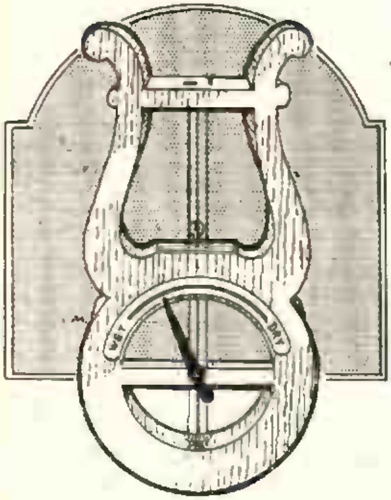


For weather forecasting a handyman can easily make

A CORD HYGROMETER



THIS novelty is a useful article, as it helps a lot to forecast the weather. It might be best described as a poor man's barometer. Actually it is an hygrometer, as it depends on the humidity of the atmosphere to function.

In the hygrometer, the subject of this article, the contraction or expansion of a twine causes a spindle to turn and through the pointer attached to it register the moisture in the air, with the possibility of rain or fine weather.

Framework

The frame, Fig. 1, can be marked out direct to a board of wood the size given in the diagram. The thickness of the wood can be from ⅜in. to ⅞in. On the lower half of the wood strike the two circles shown. The upper half should be divided into 1in. squares, and the shape copied. Get both sides alike to look symmetrical. Now cut out.

From a piece of the same thickness board cut part A (Fig. 2). Lay across the frame at 1½ins. from the top, and mark with a pencil where it crosses. Here cut the wood out to half its thickness. Do the same with A so that it can fit across level. Mark the centre of it and on the left of the line and touching it cut out a slot ½ in. long and ¼in. wide. In this slot a small metal pulley is inserted using as a spindle for it to revolve on, a thin wire nail driven through. The pulley can be taken from one of those metal runners, sketched at C, used for hanging window curtains, and to be bought for a few pence at any stores.

At a distance of ¼in. to the right of the centre line across A, drill a small hole for the twine or cord to enter. From pattern B, cut two in sheet brass or other metal. Drill these in their centres, the holes being just right to suit the spindle to which the pointer will be attached. This can well be a 1¼ins. wire nail. Drill both at their ends also for fixing across the frame lower down, as shown by the dotted lines. These parts should be recessed in the wood quite level.

Take the nail, intended for the spindle, file off its head and try it in the bearing holes in parts B. See it can turn smoothly. On one end, the rear one, fix on as a tight fit, a ½in. disc of thin fretwood. Push the spindle in; the disc will prevent it riding out, at least backwards.

Pointer

The pointer, D, is cut to the shape shown from ⅛in. fretwood like the disc. Bore a small hole for it to be a tight fit on the spindle and interpose a thin washer between it and brass bearing strip, B, to lessen any friction. Detail sketch, Fig. 3, will help to make the above details clear. This also shows the cord or twine which operates the movement, wound round two or three times on the spindle.

A thin twine or cord will serve nicely for this instrument. Take a sufficient length, say about 3ft. and at one end tie a small hook, bent up from stiff wire, such as you can get from a safety pin of the larger size. The diagram, Fig. 4, should now be referred to for the following details.

The twine goes from the spindle to the top pulley, that in part A, thence round it and down again to a second pulley below the spindle, then across to a third pulley and up to part A again, being wedged in the hole bored therein for the purpose.

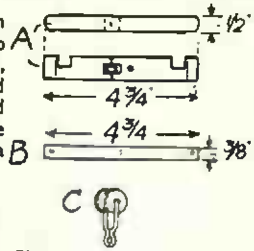


Fig. 2—Pulley and guides

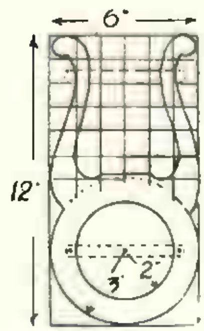


Fig. 1—Framework

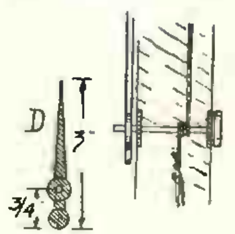


Fig. 3—Pointer details

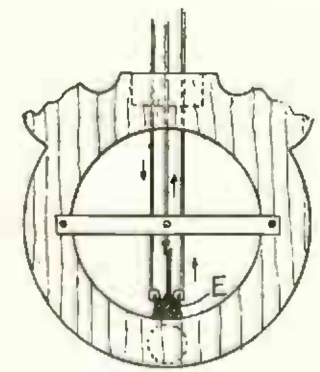


Fig. 4—Back view showing pulleys

Before this arrangement can be carried out, three holes for the twine to pass through must be bored through the frame, directly over the spindle. These holes should be the right distance apart to allow the twines to be parallel, also they should be at least 3/16in. to ¼in. for enough freedom.

The second and third pulleys mentioned above are similar in pattern to that at the top. They are fixed just below the spindle with a staple each, and are kept the right distance apart by means of a slip of wood, as at E. This slip is fixed in position with a screw hook, the hook being directly below the middle twine, the one with the hook tied to it. All being correctly arranged the twine is carried round the pulleys in the direction indicated by the arrows.

Connect the hooks together with a rubber band as seen in Fig. 4, draw the twine through the hole in A and when at a slight tension, wedge it in with a pointed matchstick. To the back of the frame, where shown in Fig. 4 by a dotted oblong at top and a circle at the bottom, glue ½in. thick blocks of wood to keep the instrument clear of the wall when hung up. To the top block screw a brass wall plate for hanging purposes.

The woodwork can now be stained and varnished or enamelled as preferred. A simple dial, a suggestion of which is shown in the finished view of the instrument, can be neatly printed in indian ink on white paper and be glued on where shown. As the direction in which the cord is wound on the spindle determines the movement of the pointer, it should be wound clockwise if the indication WET is to the left.

Now hang the instrument either in the hall or passage, or near a door somewhere. The hall is about the best place and let it settle itself. Some time may be saved if, before arranging the twine, it is thoroughly dried. Then the pointer can be fixed against DRY straight away. Otherwise, if reference can be made to a nearby barometer, the pointer can be set to that part of the scale likely to correspond most to the scale on the professional instrument. But let the hygrometer settle in its place for a few days first.

Always tap the instrument before consulting it, to overcome the natural inertia of the pulleys and note which way, whether towards WET or DRY, the pointer jerks.

A simple method of fitting a door with

A DRAUGHT EXCLUDER

ALTHOUGH at present we may not notice the draught that blows under the door, we may be sure it will still be there next winter if we do not do something about it. The period during the summer months is surely the time to take the matter in hand and here is a simple and inexpensive method of preventing the legs and feet being chilled by the draught blowing from under the door as we sit by the fireside.

From Odds and Ends

At very small cost, comfort can be yours if you are worthy of the name of handyman. All the materials needed for a most efficient draught excluder, are those shown in the panel all of which are easy and cheap to obtain.

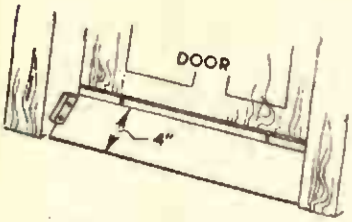


Fig. 1—The gadget fitted to the door

Look at Fig. 1 before you start; it gives an idea of what the gadget looks like when completed and attached to the door.

Make a start by sawing off the strip of orange-box wood so that it is ¼in. narrower than the width of the bottom of the door frame. Do the same with the 1in. by ½in. piece of wood. Keep the bit you saw off it, to make the buffer-stops shown in Fig. 2.

Plane a bevelled edge along one side of both pieces, then fasten the strip of felt or leather, whichever you are using, along the other side of the piece of orange-box. Use a little glue, and then tack it on with panel pins spaced about 1in. apart.

Now tack and glue the strong cloth or American cloth, to both pieces of wood. This makes a sort of tapered hinge, as you see in Fig. 3. Continue by drilling two holes in the 1in. by ½in. wood, about a third of the length from each end. The holes should be just large enough to admit

MATERIALS

- A strip of wood from the side of an orange box (usually about 3ins. wide and about ⅜in. thick).
- A piece of wood 1in. by ½in., about 3fc. long.
- A strip of strong cloth, or American cloth 2ins. wide.
- A narrow strip of felt, leather, or even a flat leather bootlace.
- Six wood screws 1¼ins. long.
- 6ins. of springy wire and a few ½in. panel pins.

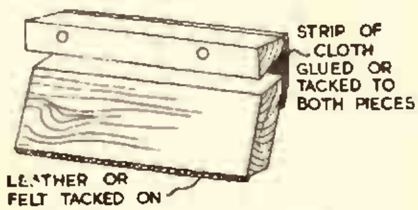


Fig. 3 Section showing parts in place

two of the woodscrews. Countersink the holes if necessary.

Close the door, and, allowing the piece of orange-box wood to come to about 1in. from the front of the doorframe (see Fig. 1), mark through the holes you have drilled, make a "start" there for your screws, and screw the article lightly into position.

Spring Clips

Snip the piece of wire into two, and make the springs to the shape shown in Fig. 4. Remove the work from the door now, and slip the eyes of the springs over the ends of the screws, as shown in the same detail. Screw the job firmly into place.

You must now make the buffer-stops to suit, following the idea shown in Fig. 2. Be careful to keep the excluder firmly pressed down on the floor whilst you fit them in position on the door frame. You will, of course, have drilled two holes in the buffer-stops to take the screws. Secure them to the door frame as you see pictured in Fig. 1.

You will find that, on opening the door, the lower part of the excluder lifts clear of the floor to allow it to pass over carpet or uneven floor.

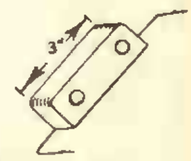


Fig. 2—Buffer

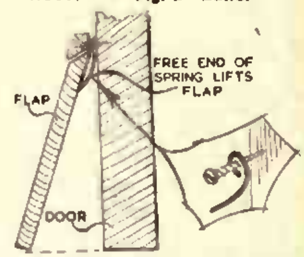


Fig. 4—Section of door and detail of spring and screw

When the door is closed, the excluder fits snugly to the floor and nobody says, "Whew! what a draught at my feet".

If the floor is misshapen or worn, make the lower part of the flap to fit before attaching the leather strip. If you wish to use the device on an outside door, make it of slightly thicker wood; hardwood if you can get it.

The device can easily be stained or painted to match the door, so that it is never noticed. It has the further advantage of being very easily removed when not required.

Tree Seat—(*Continued from page 195*)

should be made to the dimensions shown here, then the angle bearers will be about 20ins. long and the shorter ones about 14ins. long. Both measurements are overall and allow for the tenons at both ends.

The seat consists of varying lengths of sawn branch wood from rather more than 2in. diameter stuff. Choose sound straight lengths, and let each piece meet the angle bearer half-way across its "flat" top, as seen in the right-hand plan, Fig. 2. There should be six lengths to each of the four seat layers. They fit together as evenly as possible and are nailed with either copper or galvanized nails.

The underside, or cut side of the layers should be creosoted before being nailed on, and the tops of the bearers should also be similarly treated. A covering edging layer should be added as A, in Fig. 1, nailed securely to the posts and to the top front layer.

The front posts are next fitted with cross bracing pieces, seen in Fig. 5. Careful measurement must be made for these, and the ends shaped to fit into vee shaped recesses cut in the uprights. They are securely nailed in place and the smaller, more or less decorative pieces, cut in and nailed to make a symmetrical panel.

It now remains to form the backrests to the seat, and the diagram, Fig. 6, shows how they may be made. No hard and fast measurements need be given for the panels, of which there are eight. The figures given in the diagram should be well suited for the tree-seat under discussion. Wood about 2ins. in diameter answers well for the back panels and cross pieces. Vee joints are the best and strongest here with secure nailing.

Each upright of the panels should come directly to the back layer of the seat, and immediately over the upright posts below. The lower extremities of the panel uprights also should be cut hollow, as it were, to fit over the seat pieces to get a secure fixing.

For outdoor or inside use you can make this portable

CHILD'S SWING

MOST kiddies find enjoyment in swinging, usually in the garden, but as this can only be indulged in in fine weather, it becomes a seasonal pleasure, and occasions some disappointment when the weather is not suitable. The swing, illustrated, has no such drawback, as it can be easily conveyed indoors anytime and be used in the house.

Deal can be used for making it, good sound timber free from any large knots being necessary, to stand up to the strain. Parts of the swing are grouped together in Fig. 1. Make a start with the top cross-bar, A.

Framework

Get out a piece of the timber to the dimensions given, and on the sides pencil across the sloping lines at each end. These are at an angle of 10 degrees from the vertical and 2ins. apart. Square these across the edges, top and bottom. On both edges gauge a pair of lines down the middle, and ¼in. apart. Between these, and 12ins. apart, bore holes to fit the swing hooks.

Purchase a pair of these hooks first so the correct size holes can be measured. As they will have to go through 4ins. of wood, they will need to be long ones, and should be about 8ins. or more. Owing to the length of the holes it will be advisable to bore these from both sides to better ensure them being square with the top surface of the cross-bar, and in the centre.

Crossbar

The bar has now to be cut tapering in section, as in detail, B, a job best done with the handsaw, leaving the top edge just ¼in. wide, the width of the pair of lines already gauged across.

Finish the bar by sawing the ends to the 10 degrees angle of the lines, to suit

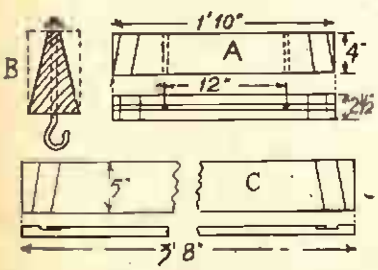
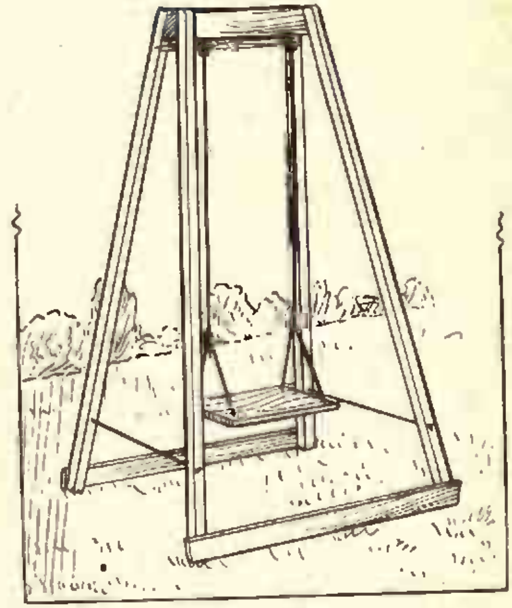


Fig. 1—The main parts

the slope or splay of the legs. The lines will, of course, be now sawn away, so the inner ones should be re-pencilled across, as they act as guides to fitting the legs at their correct slope.

The four legs (not drawn separately), are lengths of 1½ins. by 2ins. timber, just 6ft. long each. These are joined across in pairs at the bottom ends by cross-bars, C. Cut these bars from 1in. thick wood, to length given. They should be grooved across, ⅜in. deep and 2ins. wide, at a distance of 1in. from each end, to admit the legs in as a close fit. The angle of these grooves is the same as that at the ends of the top cross-bar, i.e., 10 degrees from the vertical.

Try the legs in, and if the grooves are sawn out at the angle given, the top ends of them should be the same distance across as the length of the bar, A. Likely error here can be avoided, if the legs are temporarily fastened to the bar, A, and lower bar, C, laid across the legs at the bottom, and their angle pencilled across by drawing the pencil along the legs as they lie on the bar.



Having got these details satisfactory, screw bars, C, firmly to the legs, then, screw one pair of legs to the top cross-bar. The other pair are to be hinged to it, to enable them to fold in for carrying.

Take this second pair of legs, and across them, at 4ins. down from the tops, fit a wood bar, as at D1, in Fig. 2. This can be 1in. thick and not more than 1½ins. wide. It is halved into the legs at each end.. The second pair of legs are now hinged to the cross-bar, as shown in Fig. 2, D, using a pair of 1½in. iron backflap hinges for the purpose. Note, these hinges are screwed to bar, D1, not to the legs, and should be clear of the hooks in the bar, A. The rear legs should now be able to fold inwards.

Preventing Wobble

At the back of the top cross-bar, and butting up against the legs, as at E1, in

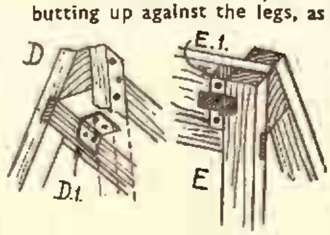


Fig. 2—Details of top fastening

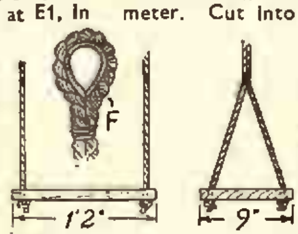


Fig. 3—The seat and eye detail

Fig. 2, a piece of hardwood, as thick as the legs, is screwed to ease the top strain here when the swing is in action.

To keep the legs from any possible tendency to wobble inwards, a pair of metal turn-buttons are added, in the position seen at E and E1, in Fig. 2. It may be as well, too, to fit across, at the bottom, stay ropes similar to those employed on a pair of household steps, as shown in the view of the completed swing. The whole should now stand quite firm, either in the garden or indoors.

For the seat, cut a board of stout wood to the size given at Fig. 3. At 1in. from each corner bore a hole of the size to admit the swing ropes. The edges of these holes should be slightly rounded off to avoid fraying the ropes unduly, during the action of swinging. Also round off the edges of the board, and glasspaper it to smoothness. It is just as well to glasspaper the whole woodwork of the swing, too, to get rid of any roughness, and possible splinters.

The Ropes

A good strong rope should be purchased for this swing, ⅜in. to ½in. diameter. Cut into two sufficiently long lengths, fold at the centres, then insert a metal thimble and lash the ropes together under it, as in the detail, F, in Fig. 3.

Now thread the ends of the ropes through the holes in the seat board and there make them secure underneath. Take particular care to get the ropes the same length—you will want the board to swing level, not tilted up.

Finish this part of the job by bringing each pair of ropes together, about 12ins. to 15ins. above the board, and there lashing them securely with fine cord. Do not set the board too high.

Glass-Topped Table

I AM going to make a table with a glass top, but do not know where to get the top from, or how it will fasten to the frame. (J.L.—Wortley).

GLASS for a table top can generally be supplied by any good builders' merchants, who would cut it to size and if desired, have the edges ground and polished for you. Usually a top of this kind is secured by means of four triangular shaped metal clips which cover the corners of the glass and are screwed to the edges of the table. Such fittings are generally to be had from any good ironmonger.

Ink Stains

WHAT is the best method of removing printing ink from a grey warehouse coat? I have tried several methods, and none of them has been very successful. (L.B.—Headington).

AS printers ink is often blended with resinous and other gums, we suggest you try placing the material between layers of clean blotting paper and pressing with a moderately hot iron which should by the heat, soften the resin and allow it to be absorbed by the paper. Bleaching with Parazone or oxalic acid can be tried if the heat treatment fails, but there may be risk of making the stains worse.

Lighting Extension

PLEASE tell me the easiest method to fix up a light in my workshop, constructed of wood and situated over 14yds. away from the house. (P.B.—Epsom).

PRESUMABLY you have electric current on, in which case it is quite easy to carry an extension to the workshop. Purchase a lamp fitting from the stores, and fit up in the workshop, adding also a switch. From there, attach a suitable length of rubber or lead covered twin electric cable to the nearest lighting point in the house supply, and connect to that with a plug fitted to the ends of the cable. If you have no electric current available, about the best light to use is a Tilley lamp which you can buy at any hardware stores.

Riveting China

ARE you able to recommend an apparatus for riveting china? (J.B.—Taunton).

THE tools required are a small archimedean drill, some glass hard diamond pointed drills, some diamond dust or coarse Carborundum, and some soft copper wire about 20 gauge. The work to be drilled has to be firmly supported on a sandbag or a bed made of plasticine or modelling paste, or the like. The positions for the rivet holes are marked opposite each other on each side of the fracture, holes are drilled using a drill point lubricated with turpentine or a little diamond dust, or Carborundum can be applied to the start of the hole, and the latter "ground" out. When all the holes have been drilled, the parts are assembled—piece by piece and a short piece of the copper wire inserted from the front and down through the hole; the upper part is bent over and the other end put through the opposite hole and the whole drawn tight. Some practice on unwanted pieces of china is desirable, to acquire the needful knack and dexterity before attempting any important repair to a valuable piece of china.

Final details for constructing the

DON PEDRO NOVELTY

HERE are the remaining instructions for building the quaint novelty shown. Full size patterns for the figure and the cactus tree are given on page 203, ready for tracing on to odd pieces of wood.

First, cut out the body. As this is in ½in. wood, it can be cut with a fretsaw, but it is so shaped that it can also easily be cut out with straight cuts from a tenon saw. If the wood is held in a vice, this should be a simple enough job.

Two ¼in. diameter holes have to be drilled with a twist drill for the dowel legs. When this has been done, the edges are bevelled both sides where shown, i.e., all round except at the head part and between the legs. This is done with a chisel for preference, putting the wood in a vice so you can keep both hands behind the chisel. It is the wood you have to cut, not your hands.

Limbs

The head part is rounded. Note that the top of the head is cut on the slant. On this the hat brim is glued and nailed, and then the crown.

The arms are then cut, possibly both together, from ⅛in. plywood, with the outside grain going the long way. These are eventually screwed on with round-headed screws. The screw-heads are thus used decoratively, but first, the rest of the model is made and painted.

The legs are of ¼in. dowel, though pieces of pencil will serve. The feet are whittled from pieces of wood. The best way is first to take a piece of wood much larger than needed, and bore a ¼in. hole in it. Glue the wood to the end of the dowel.

When the glue is quite dry, whittle the feet. Obviously, if the feet were whittled first, it would be very difficult to drill the hole afterwards. When fitting the feet, take care that they do not project too far inwards so that they foul the saddle.

Bore a small hole where the nose is to come and force in a piece of match-stick. Cut it off so about ¼in. projects.

Paint the whole of the head pink, and the whole of the body green. The arms, at this stage not fixed, are also painted green. When dry, paint in a red V on the man's front (most of it will be covered by the bow, afterwards), and a red stripe down the outside of the arm pieces, also round the thickness of the breeches. Paint the whole of the hat black, including the underside, and paint, likewise black the legs and boots. Put in the eyes, moustaches and hair (do not forget the 'sideboards') also in black. The tip of the nose is painted bright red.

When all is dry, paint on the bow in bright blue, and use blue to paint a ribbon on the hat. All around the rim of the hat (i.e., on the ¼in. thickness), put a series of red dots, and when these are dry, put a spot of white in the centre of each. Now screw on the arms.

The Base

For the base, a rough slab of wood is best. It should have, of course, a flat base, but the outline should be irregular and the upper surface wavy. A search through the firewood pile might yield what is needed. Of course, a piece of wood could be sawn to an irregular edge and the upper surface roughened with a gouge.

Place the horse on this, and mark the position of the feet. Scoop holes for them, and let the feet sink in and then neaten the holes with plastic wood. This can be moulded into hoof shapes if desired.

The cactus plant gives a quaint effect and is easily made by first cutting a wooden shape and then modelling up with plastic wood. The base, of course, is left as a tenon, which fits into a suitable slot prepared for it in the base.

The base is painted a sandy yellow and the cactus a dark green.

How resistances and condensers can be dealt with in

COMPONENT TESTING

IN some ways resistances and condensers may appear puzzling components to test. A condenser must not pass direct current; if it does, then it is out of order. This being so, someone may well ask how such a part is to be tested? Especially as it may still be out of order if it does *not* pass current.

And with the resistances used in radio sets some difficulty is also present. They may range from a few thousand ohms up to several megohms (millions of ohms) and normal methods of continuity testing fail. Then there is the problem of determining how many ohms value an unknown or unmarked resistor is.

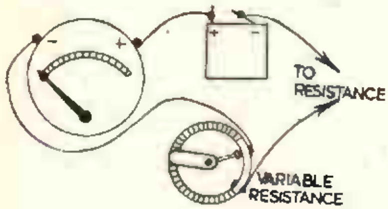


Fig. 1—How resistances are measured

Testing with Phones

Phones click when extremely small currents pass, and they can, therefore, be used with a small dry battery to show whether a resistor is able to pass current. The lower the value of the resistor, the louder the click will be, but even so this method is not wholly satisfactory as no indication of the actual value is obtained. But it is a possible standby.

With a few trials it is even possible to get some idea of the resistance value by judging the volume of the click as contact is made.

Meter Testing

For exact indication of resistance value a meter is necessary, and this is connected as shown in Fig. 1. When the leads marked "To Resistance" are short-circuited the variable resistance is adjusted until the meter shows exactly full-scale.

Now when any resistor is connected to these leads the pointer will fall back by an amount depending upon the resistance value, which can be read off the meter scale. This is the method used in radio testers, and the battery, etc., is included in the case of the instrument. The cost of such an arrangement is only a few shillings.

As meters show the current flowing it is necessary to use Ohm's Law to find out the resistance. The resistance in ohms equals the voltage used divided by the current flowing.

Adjustment

An average meter gives a full-scale reading on 1 mA (milliamp.). Suppose this is used in Fig. 1 with a 4·5 volt dry battery. To make the meter read 1 mA the variable resistance will need to be set to 4,500 ohms. By adjusting the resistance until the meter shows 1 mA we know the former is set to 4,500 ohms. As you know, 1,000 milliamps equal 1 amp. So suppose a resistance is connected and the meter shows ·5 mA that is ·0005 amp. Dividing 4·5 volts by ·0005 we get 9,000—the value in ohms of the resistance in circuit.

By working out ten or fifteen sums an "Ohms" scale can be prepared to compare with the meter scale. The value of any resistance can then be read easily.

Alternatively, it can be remembered the current passing is halved each time the resistance is doubled. ·5 mA therefore equals 9,000 ohms; ·25 mA equals 18,000 ohms; ·125 mA equals 36,000 ohms, and so on.

Testing Condensers

Since actual measurement of these requires alternating current and the calculations become difficult for ordinary purposes simpler methods prove sufficient.

Condensers of from about ·5 mfd. upwards can be tested with the meter connected as in Fig. 1. When the two leads are applied to the condenser the meter pointer should move up, then return to zero, showing the condenser has charged. The larger the capacity, the larger this momentary movement will be.

If no such movement is obtained with large condensers, then they are internally open-circuited and useless. If the pointer moves completely over, they are internally short-circuited and should also be discarded.

Any leakage will be shown by the meter, as for ohms. Good condensers should not leak, unless they are electrolytic ones, where this is necessary to obtain polarisation. Such condensers will be known as the polarity is marked on them and a leak is usual here, not a sign that the condenser is beginning to break down, as it is with the other condensers.

Small condensers can be tested for short-circuit in the same way.

Buzzer Test

Fig. 2 shows a simple open-circuit test at "A". If the condenser is in order the volume in the phones will increase when it is connected to the leads. If a condenser is connected in series with a battery and phones there will be a click (faint) on making contact, showing it is charging. If there is also a click on disconnecting, the condenser leaks slightly. If there is a loud click both times, the condenser is shorted internally. Because of the method of construction, internal leaks and shorts are not rare in condensers.

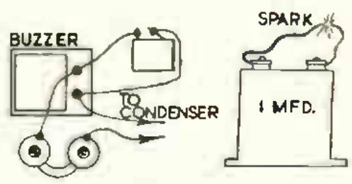


Fig. 2—Testing condensers

Spark Test

An excellent test for condensers of about ·5 mfd. upwards is to connect them momentarily to a high tension battery. Upon bringing the leads together, as shown at "B", a good spark should be produced. The larger the capacity of the condenser, the bigger the spark.

A good condenser will spark even after being disconnected for eight or ten seconds from the battery. With a leaky condenser no spark will be obtained after a second or so as the charge will have leaked away inside.

After testing for shorts with phones, very small condensers (·0001 to ·001) may be tested for open circuit with the buzzer, or by connecting in series with a receiver aerial lead. If the programme disappears, the condenser is internally open-circuited.

Miniature Lorry—(*Continued from page* 196)

exactly, complete with backward stagger. Assemble up to this point, putting in a seat ⅜in. by ⅜in covered in passe partout. Stain the inside of cabin.

Make the roof in soft clean wood, as in Fig. 7, and well round off as shown, to a nice smooth curve by finishing with a fine grade of glasspaper.

The model maker can choose any type of bonnet for his model, but the one shown at Fig. 8 is probably the most popular. A rough measurement for this would be a block of wood ⅜in. wide at front base, ⅜in. long and 9/16in. high, sloping up and outwards slightly towards the cabin.

There are many additions one can make. Strapping from strips of thin card and a radiator from thicker card. Small lamps from pin-tops and ⅛in. dowel. The screen edge can be improved with thin silver paper as most of these are chromium plated. Number plates can be made on black paper and using white ink with a mapping pen. Mudguards and wheels can all be fitted as in previous models.

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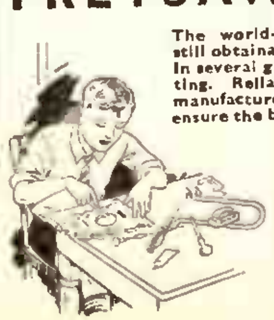

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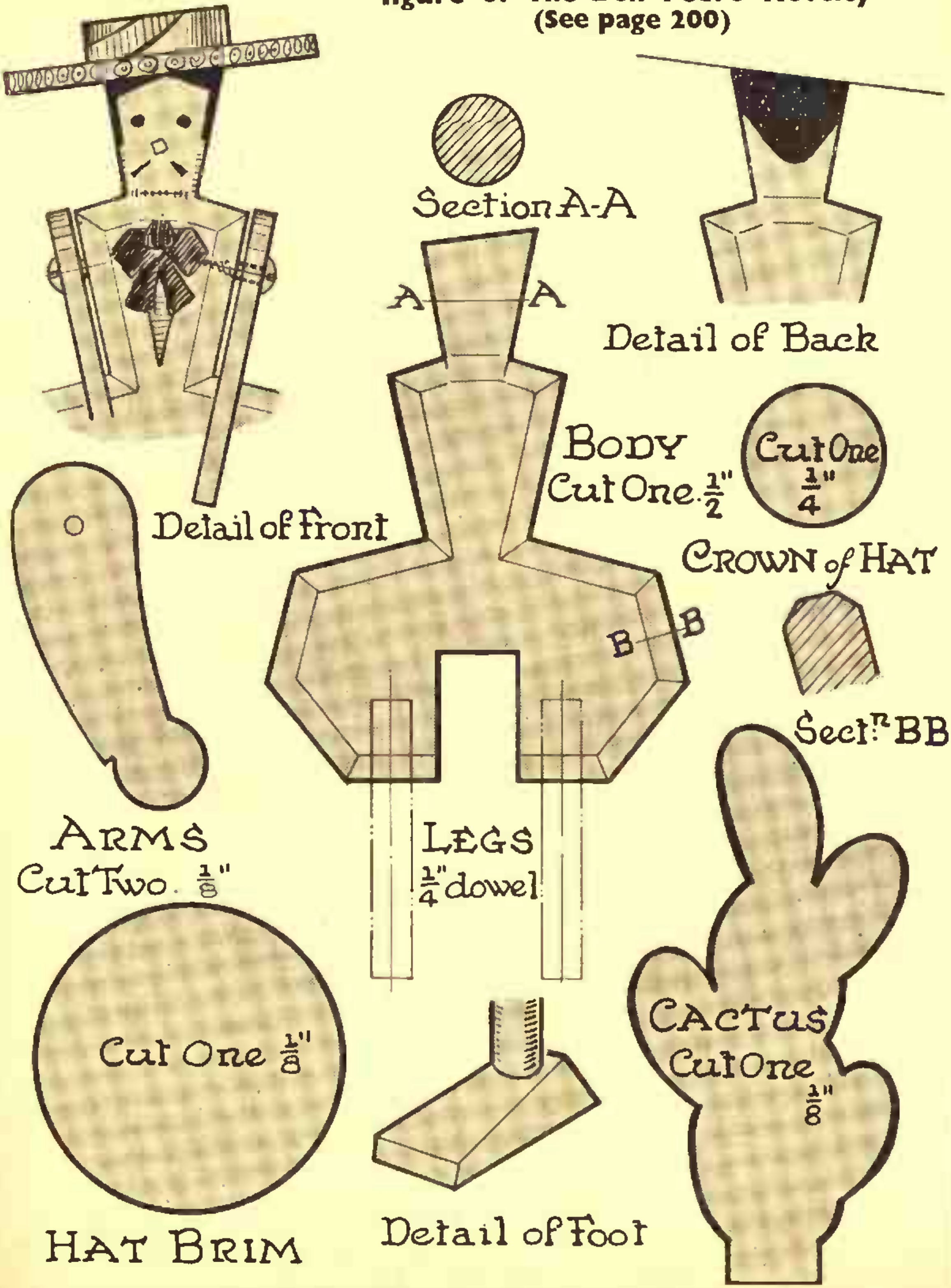
Patterns and details for the figure of The Don Pedro Novelty
(See page 200)



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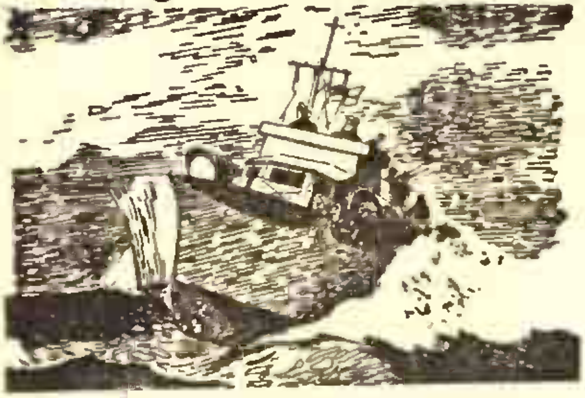

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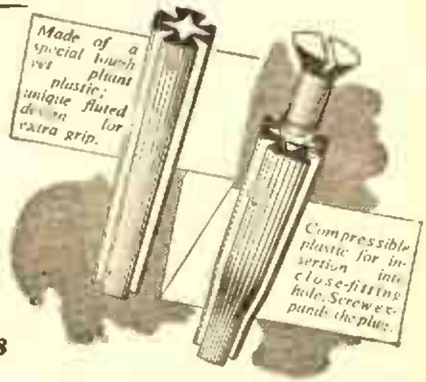

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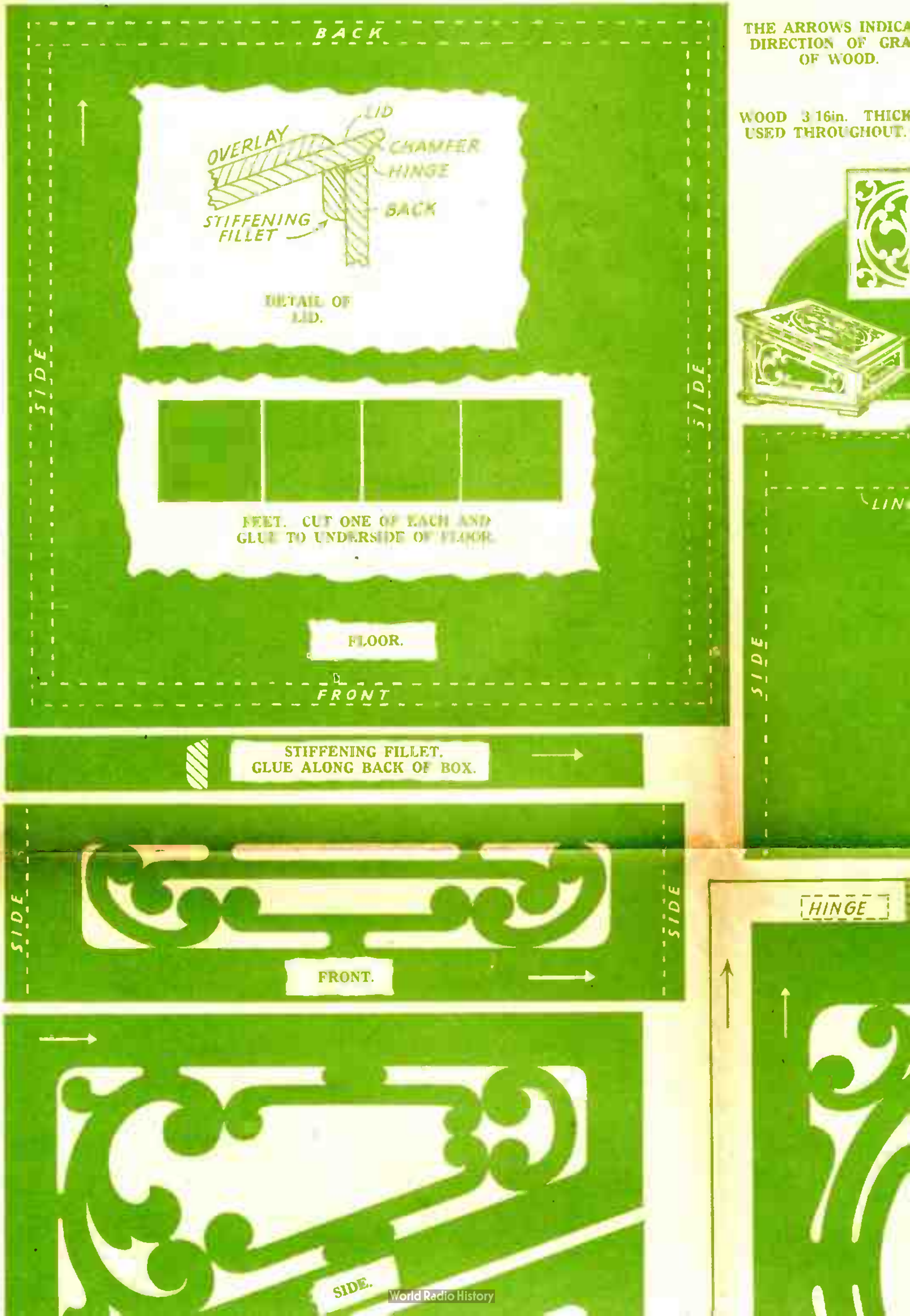


THE ARROWS INDICA
DIRECTION OF GRA
OF WOOD.
WOOD 3 16in. THICK
USED THROUGHOUT.
BACK
SIDE
LID
OVERLAY
CHAMFER
HINGE
BACK
STIFFENING FILLET
DETAIL OF LID.
FEET. CUT ONE OF EACH AND GLUE TO UNDERSIDE OF FLOOR.
FLOOR.
FRONT
SIDE
STIFFENING FILLET. GLUE ALONG BACK OF BOX.
SIDE
FRONT.
SIDE
SIDE.
SIDE
LIN
HINGE

THE ARROWS INDICATE DIRECTION OF GRAIN OF WOOD.

Hobbies DESIGN No. 2804 27-7-49

SUPPLEMENT TO HOBBIES No. 2804.

WOOD 3/16in. THICK USED THROUGHOUT.

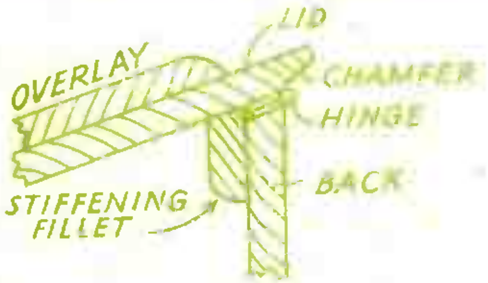
HANDKERCHIEF BOX

SIZE—6¾ins. SQUARE.
4ins. HIGH.

PANELS OF WOOD REQUIRED FOR THIS DESIGN

TWO H3 TWO G3

Materials for making this design are supplied by HOBBIES LIMITED, Dereham, Norfolk. Price on application.



DETAIL OF LID.

BACK

FEET. CUT ONE OF EACH AND GLUE TO UNDERSIDE OF FLOOR.

FLOOR.

SIDE

FRONT

STIFFENING FILLET. GLUE ALONG BACK OF BOX.

SIDE

CHAMFER

LINE OF STIFFENING FILLET

SIDE

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SIDE

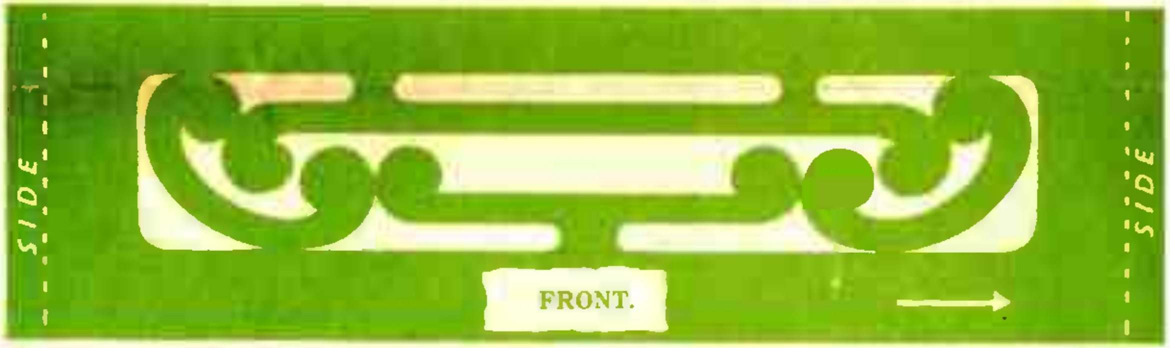
BACK.

HINGE

CHAMFER ON UNDERSIDE

HINGE


GLUE ALONG BACK OF BOX.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FRONT.
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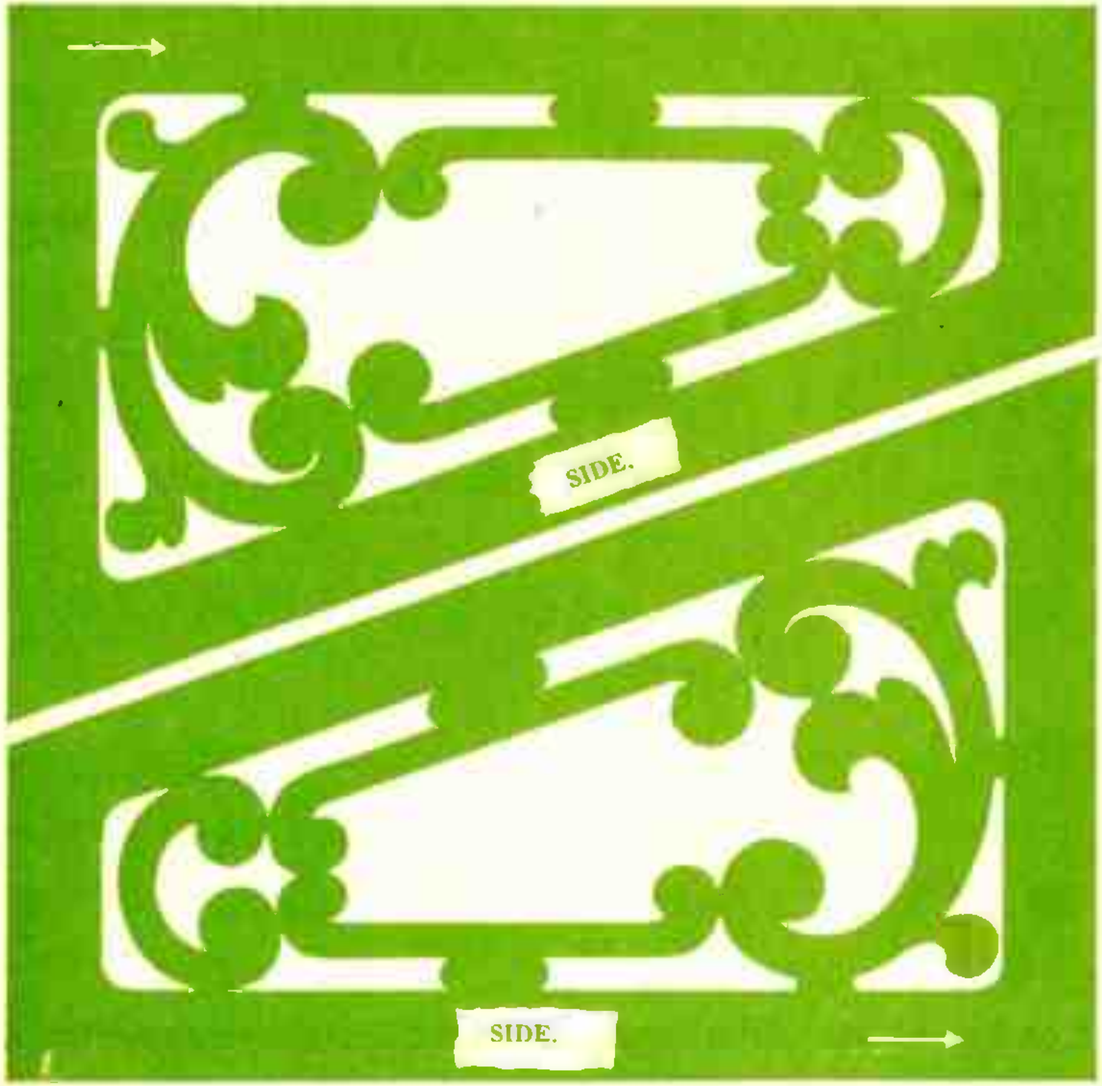
SIDE.
SIDE.


BACK.


HINGE
CHAMFER ON UNDERSIDE
HING
OVERLAY ON LID.
LID. CUT ONE TO OUTLINE.
PRINTE


Price on application
CHAMFER
LINE OF STIFFENING FILLET
SIDE
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SIDE
BACK.
SIDE
HINGE
CHAMFER ON UNDERSIDE
HINGE
OVERLAY ON LID.
LID. CUT ONE TO OUTLINE.
PRINTED IN ENGLAND.

Instructions for making a

HANDKERCHIEF BOX

THE Handkerchief Box shown can be made from the patterns provided, quite simply. If you prefer a plain article you can, of course, omit the fretted work in the sides and even in the lid. At the same time, a little ornamentation makes the article much more attractive, and is certainly worth the work involved.

The patterns can be pasted to, the wood except where they are plain rectangles, when they can be marked out with ruler and pencil. The wood throughout is $\frac{3}{16}$in. thick, cut with the fretsaw in the usual way.

The construction is of plain box formation, built on the piece forming the floor. The two sides and the front are fretted, but the back is a plain part. The sides are glued between the back and front, the whole framework standing $\frac{3}{16}$ in. inwards from the edges of the floor. Get this box frame rigid and strong, and if necessary, drive some pins through from the underside of the floor into the edges of the uprights to stiffen the whole thing. Little angle pieces can also be glued to the inner corners if needed.

The Lid

The lid is a plain piece of wood $6\frac{3}{8}$ins. square. On the top of this is the fretted overlay. The complete unit is hinged to the upper edge of the box. For this purpose, a stiffening fillet is glued along the top of the back inside, so the lid may rest upon it. A detail of this is given in the sectional drawing on the sheet, and you will notice that the upper edge of the stiffening fillet has to be chamfered along with a plane to bring it in line with the chamfered edge of the back itself.

Hinge Strength

The $\frac{3}{4}$in. hinges are screwed to the upper edge of the back with the knuckle outwards, and if necessary, a small recess must be made to allow the flanges to lie flat and flush. Notice in the detail, too, as well as on the pattern of the lid, that this back edge must be slightly chamfered off. It is shown by the shaded section and this angle must be maintained along the whole length, thus when the lid is open, it will slope slightly backwards.

To prevent undue strain on the hinges, it will be as well perhaps to add a small length of fancy ribbon or cord, or even chain, between the lid and the inside of the box. It can be fitted to two eyelets, one on the inside front of the box, and the other near the front edge underneath the lid.

Corner Feet

Finally, four $\frac{3}{4}$in. square feet are glued beneath each corner, being set back $\frac{1}{8}$in. inwards from the outside. It is as well to line the inside of the box behind the fretted sides and front. If you have some thin plywood or similar material, this will serve the purpose, glued behind the fretted portions. Failing that, a linen or imitation leather material can be used.

Remember, in any case, if you are going to stain and polish the finished article, this should be undertaken before the lining is put in.