

TWO-WAY ROLLER LOOM

THE wooden loom as described in Part 4 of this series can only be used to make a length of weaving equal to the distance around the length of the loom. If longer lengths are required, the loom must be converted to a roller loom.

five holes along their lengths, one near each end, one in the middle, and two at the quarter distances. Make sure that the holes in both laths correspond. Tie one end of each lath together leaving a $\frac{1}{2}$ in. gap between them. Slide one of the laths through the fold in the cloth, leaving the other outside. When in position tie the outer ends of the laths together. Make holes in the cloth corresponding to the holes in the lath inside. Tie through these holes in the cloth and the inside lath to the same holes in the outside lath. Repeat for other roller. (See Fig. 1.)

the rollers, and are fixed with round headed screws to the 1 in. cube. If these are screwed loosely, the rollers are held in place, but can be turned easily. If they are screwed tightly, considerable force is needed to turn the rollers. This enables the warp to be kept taut during the weaving, yet it allows the rollers to be turned to take up the weaving when the screws are loosened.

Materials for conversion are:-
 Two 19 in. lengths of broom-handle.
 Two pieces of strong cloth each 6 in. by 13 in.
 Four pieces planed lath each $\frac{1}{2}$ in. by 14 in.
 Four pieces of tin each $\frac{1}{8}$ in. by 4 in.
 Four 1 in. wooden cubes.
 Four lengths of 1 in. lath each $3\frac{1}{2}$ in. long.
 Four 1 in. round headed screws, some 1 in. and $1\frac{1}{2}$ in. nails. Some $\frac{1}{8}$ in. brads or tinnacks.

Remove the ends of the loom and saw one of them down its length so that the resulting two pieces are just under $1\frac{1}{2}$ in. wide. Screw these narrow pieces as at A in Fig. 2.

Setting-up and operating

First decide upon the length of weaving required. The beginner is advised to try no more than two yards at his first attempt. If the length is to be precise, allow 9 in. for tying-on and 3 in. in every yard for shrinkage.

Double cloth in half and tack with a double row of brads to the broom handle, 3 in. in from either end (Fig. 1). Ensure, as well as is possible, that the folded side of the cloth which is free of the broom-handle, is parallel to the broom-handle and not longer at one end than the other.

Take two of the $\frac{1}{2}$ in. laths and make

Nail the $3\frac{1}{2}$ in. laths at each corner of the loom so that each projects $\frac{1}{2}$ in. above the loom (See B in Fig. 2). Place rollers up against them, then nail 1 in. cubes along the side of the loom right against the rollers. Bend the pieces of tin to right angles, and nail one side of the right angle to the $3\frac{1}{2}$ in. corner pieces. The other sides of the right angle project over

Next decide upon the width required, remembering that the heddle will only take widths up to 14 in. Allow $\frac{1}{2}$ in. for shrinkage of the width. Now the weaver can calculate the number of warp strands needed by multiplying the width, in inches, by thirteen, which is the number of holes and slots per inch on the heddle. The beginner should check this number by counting the number of holes and spaces, remembering to begin and end at a hole. There should be an odd number of warp strands. To this number add two more for doubling the outside strands for selvages, or four more if two strands on each side are to be doubled.

The setting-up now described is unorthodox and is aimed at simplifying the more complicated normal method for the beginner. The method is suitable only for the type of loom as set out in this article. When he has become more efficient, the beginner can discover the accepted method for himself in any book on weaving.

Untie the cloth stick attached to the cloth on the roller at one end of the loom. This end will now be considered as the back of the loom. Re-tie the stick and the stick inside the cloth at the ends only, so that there is a gap left between the stick and the cloth sufficient to allow the passage through it of an ounce ball of 3-ply wool. The loom is now clamped to the end of a draw-leaf table, or any similar object, in the position as shown in Fig. 3.

At the other end of the table a framework, with a base of 15 in. by $\frac{1}{2}$ in. and sides of 4 in. by $\frac{1}{2}$ in., is clamped. The 15 in. lath to be used as a warping post is screwed or nailed lightly across the top of this framework, so that it is easily removable.

Strings are taken from a hole at A to a

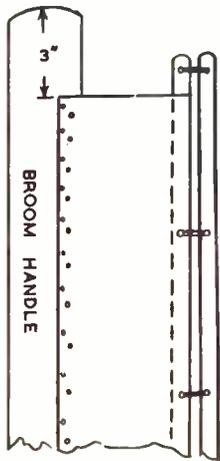


Fig. 1

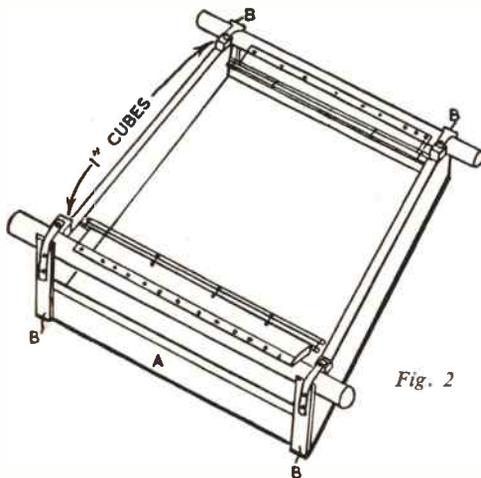


Fig. 2

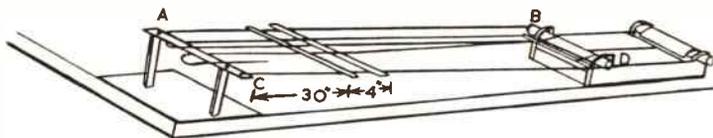


Fig. 3

hole at B; and from a hole at C to a hole at D; and are kept as taut as possible. 15 in. warp sticks are now tied across this string with the first at 30 in. from the warping post and the second 4 in. further on. They are tied together with string through the holes at their ends. The set-up is now ready for the making of the warp.

Tie the end of the wool to the cloth stick at point B. Take the ball of wool to the nearest warp stick and pass it over the stick and down under the next. Continue to A, passing underneath and up over the top and back to the first warp stick. Pass over this and under the next. Continue to the loom and pass under the cloth stick and return in the same way as for the first strand. These movements are repeated for the number of times necessary to set-up all the strands needed. It will be noticed that the wool crosses every time it reaches the gap between the two warp sticks. Ensure that each warp strand lies side by side.

Now two persons are needed to take up the warp on to the roller. One stands so that the length of the loom is before him and rolls the warp on to the roller, turning the roller away from him. A screwdriver is to hand to tighten the retaining screws on the roller to prevent slipping when the rolling stops. The second person removes the warping bar from the framework and moves towards the loom as the warp is rolled on, keeping it taut at all times.

The rolling must be carefully watched. The spacing must be kept uniform and no strands must cross. When the cross in the warp reaches the back of the loom the rolling stops and the retaining screws are tightened. The weaver can now complete the setting-up on his own.

The heddle is now placed in position and is tied to the sides of the loom. This string is removed when the setting-up is finished. The weaver now removes the warping bar from the end of the warp, cuts the ends of the warp to separate the

strands, and counts off from the left in bunches of thirteen, with himself now standing at the front of the loom. An elastic band is slipped around each bunch to keep them together. Now the threading begins.

Carefully choosing the outside strand, he takes it through the left-hand hole on the heddle, using a fine hook. The next strand on the warp goes through a space; the next through a hole; and so on. When the first thirteen are through, they are bunched together and tied on to the front cloth stick. The remaining bunches are dealt with in the same way, care being taken to see that the tension is the same throughout.

When all the warp is set, the back roller can be loosened and a little of the warp rolled on to the front roller. Both rollers are tightened to keep the warp taut.

The weaving now proceeds in the manner already described for two-way looms.



Repolishing a Pipe

I WOULD be obliged if you could let me know a method of repolishing a smoking pipe. (D.B. — London, N.18.)

THE ordinary polish is a hard wax. You may revive it with furniture polish rubbed on and left a short time, then rubbed with a coarse cloth before finishing with a soft one. Repeat the process after a few days. A wax polish, such as Johnson's Wax Floor Polish may give a harder finish. Do not use french polish or cellulose. (Note: some smokers maintain that rubbing the pipe on the nose will preserve a high polish).

sliding or rotating shutter in the horn, but it is difficult to say exactly what effect this would have, without experiment. A similar device might be tried in the tone arm. These methods could only allow volume to be reduced, not make more powerful reproduction possible.

* * *

A 'Storm Glass'

COULD you please tell me what ingredients a 'storm glass' is made of? (D.F. — Hackney).

YOU are probably referring to Large's Storm Glass. To make the liquid, dissolve 3.24 grams of camphor in 13 c.c. of ethyl alcohol. Pour this into a test tube or phial capable of holding 30 c.c. or slightly more. Next dissolve 0.82 grams each of potassium nitrate and ammonium chloride in 10.3 c.c. of distilled or filtered rain water. Pour this also into the tube. Cork the tube, seal it by dipping in molten wax and finally pierce a fine hole in the cork by means of a hot needle. Set the tube in an exposed position outdoors. Detailed readings are given in some books, but are unreliable. Indeed, after many months trial and tabulation of results it was found that only fair reliance may be placed on two appearances. Namely — crystals at

bottom, with clear liquid above — fine weather; crystals rising or wholly at top — rain. After long use a gradually increasing oily brown layer appears at the surface. The composition should then be made up afresh. The liquid in a storm glass is water containing naphthalene or benzoic acid. This being white and practically insoluble in water, gives the snowstorm effect.

* * *

'Recording in Progress'

I WOULD be obliged if you would send me details of how to wire up a sign worked by batteries. The battery box and on/off switch I would like to be by my bed, and the lighted sign outside my attic door. As I do tape recordings off the radio I do not like any interference, and my mother has agreed she will not open the attic door when the sign is lit up. I would like the sign to be lit by two small bulbs. (J.H. — Bradford).

THE sign could be made from any thin wood, with moulding to hold glass in front. The wording could be printed on thin paper with the bulbs behind. Or you could place very thin paper behind the glass, cut the letters out of a piece of cardboard and place this card behind the paper so that the wording only shows when lit from behind. A simpler sign would be a flat board with the lettering, with a single bulb, perhaps red, in a holder above it. If you use two bulbs, wire the holders in parallel. Take a twin flex lead from one holder to the battery box, a switch being included in one lead to the battery. Longest battery life will be had if you use low consumption bulbs (such as cycle dynamo) .04 amp rear light bulbs) and only use one bulb, if this is enough.

Spring-wound Gramophone

I HAVE a pre-war spring-wound portable gramophone which has a built-in horn. There is no way of varying the volume. Could you please suggest a means by which this could be achieved? I would point out that the lid cannot be closed whilst being played. (C.D. — Sidcup).

IT is not usual for any volume control to be fitted in a mechanical gramophone. Needles which give softer results than the usual 'loud' type metal needle have been available in the past, but such gramophones are not now much used. It might be possible to fit some kind of

Precautions against Frost

MUCH unnecessary inconvenience and expense can be saved by a few simple precautions before winter frosts arrive, so here are a few reminders worth noting.

(1) If your stop tap is outside the house make yourself thoroughly acquainted with its position. You may have to search for it during darkness or when snow is on the ground. See that it operates in the same manner as other taps and that it is not buried under a pile of soil or debris. If the tap is fixed deeply you will need some kind of key. Such a tool can be improvised by cutting a V notch in a stout length of wood.

(2) Check all the internal pipes and fittings of your house and any which are attached to the inside face of outside walls are likely to be exposed to frost and should be insulated. Felt, straw or thick brown paper is useful if cut into strips and wound around the pipes. It is also advisable to investigate any underfloor ventilators if there are any hot and cold water pipes below the floor. It is wise to stop up these ventilators but only during the colder, wintry months. Any stopping must be removed in spring.

(3) Dripping taps are often the cause of waste pipes freezing up and this can be a real nuisance. The remedy is simple. All that is required is a new washer.

(4) Usually, we attend to all these things because we can see them but forget the cistern or tank in the attic or false roof. These are very susceptible and here again it is advisable to cover the pipes and cisterns — but be careful not to interfere with the action of the ball tap.

(5) Quite a large proportion of bursts arise with the supply of water to outside buildings such as garages, wash-houses and toilets. The trouble is obvious here — they lack the normal warmth of the house. Doors, windows and ventilating points should always be kept closed during the winter months and in many instances a small lamp left burning will be sufficient to prevent the pipes from freezing.

(6) If you are likely to be away for a period it is safer to ask your plumber to completely empty the water system, but on your return make certain that water is available at every hot and cold water tap in the house before lighting a fire at the fire-back boiler, or turning on your geyser or immersion heater.

(a) Be prepared for trouble when the pipes thaw out as the bursting occurs when the water freezes.

(b) Before attempting to thaw a pipe make certain that all the taps it feeds are open.

(c) Start thawing the pipe out from the open end — that is, nearest the open tap — using a portable electric fire in the vicinity but not too near anything which may start a fire. Rubber hot water bottles are useful for placing on the pipes but should be refilled to maintain a reasonable temperature.

(e) If any or all of these first aid methods prove ineffective, close the boiler dampers, keep a low fire, do not draw any hot water and send for the plumber.

If a pipe bursts

(f) Close the stop tap and if the leakage ceases immediately it will be obvious that it is the cold water system which is effected. Close the boiler dampers, keep a low fire and do not draw any hot water.

(g) Where the leakage continues it is obvious that the fault is in the hot water system. Leave the stop tap closed, draw out the boiler fire and switch off the

immersion heater. You may have a tap on the pipe feeding the cistern and this may be closed before drawing the water in the hot water system. Insert the plug in the bath waste and start the hot water tap running. The bath should hold the entire contents of the storage cistern and although this water cannot be used for drinking it can be used for other domestic purposes until a repair is made. Once the tap feeding the cistern has been closed and the latter drained you may turn on the main stop tap again to start the cold water system.

(h) If the leak still continues to flow after the hot water tap of the bath has ceased running it may be assumed that the burst is on the range of supply connected with the hot water cylinder and the assistance of the plumber should be obtained.

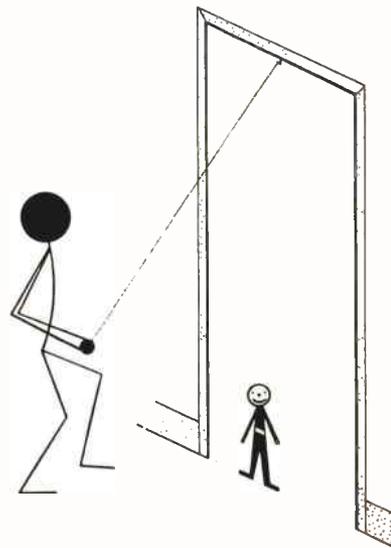
It will be appreciated that the foregoing are only emergency measures to adopt to prevent water damage to your home before the plumber arrives and they cannot be regarded as repairs. You will still require the assistance of the plumber who is always busy at these times, so keep his telephone number handy. (S.H.L.)

SWING BALL GAME

A GAME of skill is just what is needed to while away an hour on a rainy day, and there is an added pleasure when you can make the game yourself. Such a pastime is 'Swing Ball', for which you will need a rubber ball, a length of string, and a skittle in the form of a stiffly standing soldier, or a comic figure.

Sew the string to the rubber ball, using a sharp darning needle, then suspend the ball, 6 in. above the floor, from an eyelet screw fixed in the middle of the lintel above an open door. Select a 1 ft. high full length figure from a magazine or picture book, and glue this to a piece of stout cardboard. Cut out the figure with scissors, and glue a flap of cardboard behind it, so that the 'skittle' may be stood upright. You may wish to make up your skittle in plywood, and glue it to a wooden base block.

Stand the skittle in the doorway, to one side of the suspended ball, then take hold of the ball and hold it at chest level. The object of the game is to swing the ball and knock down the skittle on the return stroke. Play for twenty-one points. A player who accidentally scores a direct hit on a forward swing will lose a point. (A. E. W.)



What to do

A severe frost may catch you unawares and may freeze a pipe despite all the foregoing precautions but should you suffer this misfortune note these remarks:

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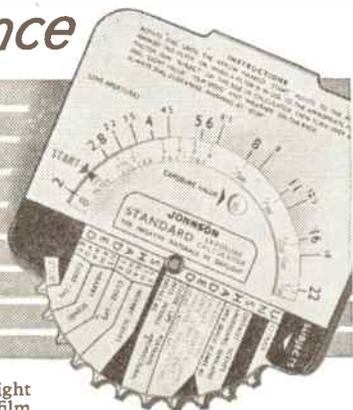
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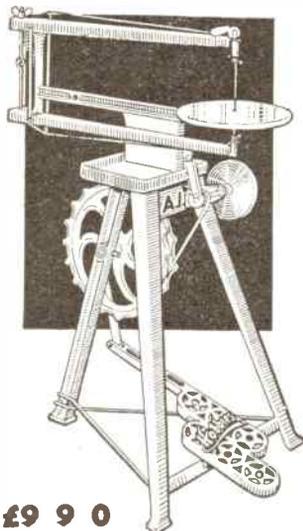
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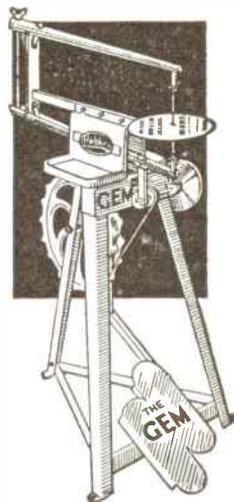
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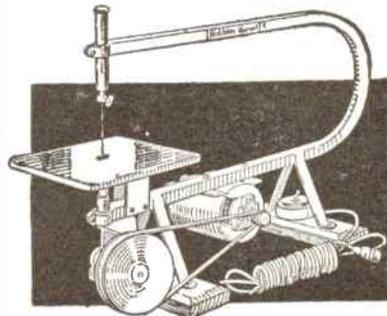
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NOVELTIES FROM LOGS

MANY attractive and inexpensive novelties can be made from logs. You can use those bought from a firewood merchant, or those obtained from pruning trees. Choose those with an attractive, firm bark, and try some of these decorative ideas for your home.

Table lamp

A log about 3 or 4 in. in diameter, and 6 in. high makes an unusual table lamp (Fig. 1). All it needs is a white plastic lampholder screwed to its upper surface. A hole drilled or burned down through the centre takes the flex. Three rubber studs in the base protect the surface on which the lamp stands.

A forked log, with one arm slightly longer than the other, can take two lights mounted in the same way. Plain white shades, with green felt or paper leaves gummed on, add an effective finishing touch.

Name-plate

A slice, 1½ to 2 in. thick, cut at an angle from a large log, makes a decorative number-plate or name-plate for a house (Fig. 2). The numbers can be screwed on, or painted on, after the log has been given a coat of clear lacquer on both sides. Use dome-headed mirror screws to fix it to the wall or gate.

Novel store cupboard

Part of a fireside bookshelf can become an unusual log store or cupboard in contemporary style (Fig. 3). A hard-board cover is hinged along its upper edge, and painted matt black. Circles of log, ½ in. thick, are varnished and screwed in place from behind, or fixed with impact adhesive. The interior can be lined with hardboard to protect the shelves.

Plant stands

Seen in Fig. 4 are rounds of log, about 6 in. in diameter, drilled round the edge to take three or four 9 in. lengths of dowelling, to make a plant stand which can be made as many 'storeys' high as you wish. It could also hang from the ceiling where floor space is limited — in a hall, for example.

Plant troughs

Window boxes or plant troughs made from 1 in. thick wood can be covered with 2 in. diameter logs split lengthwise, as shown in Fig. 5. These can be nailed in place vertically or horizontally.

Fireside set

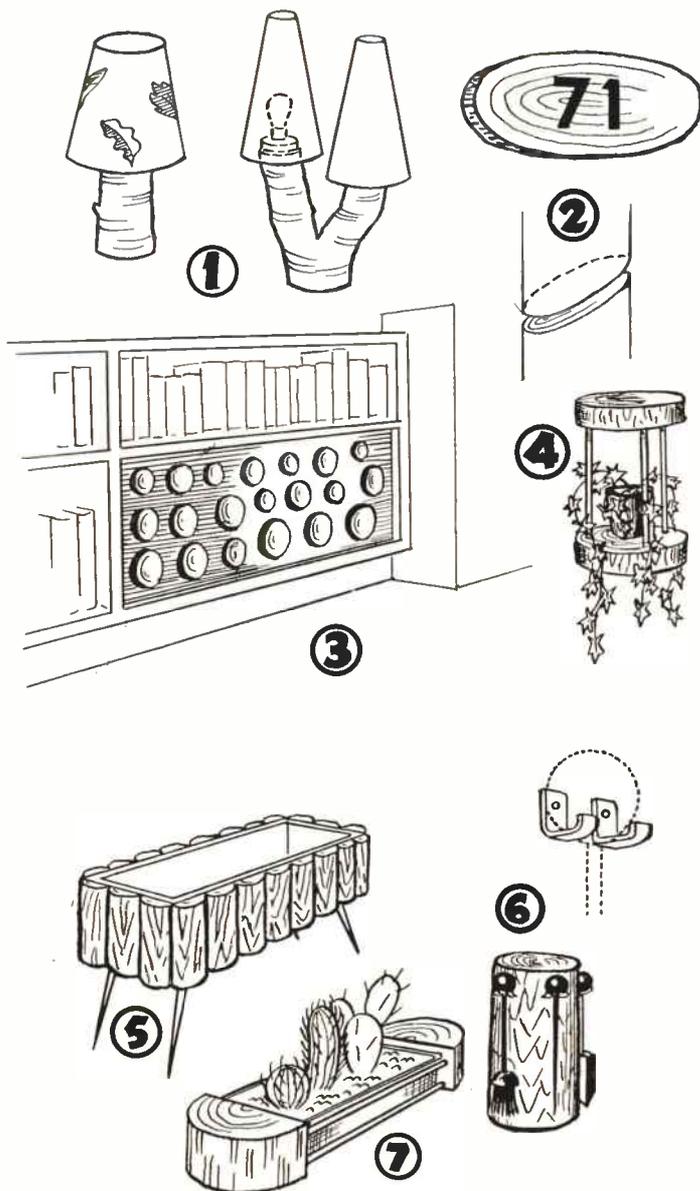
A log placed on end makes the basis for a fireside companion set (Fig. 6).

Choose one which stands firmly, and screw satin-finished steel coat-hooks round it in pairs for the poker, shovel, and brush to rest on.

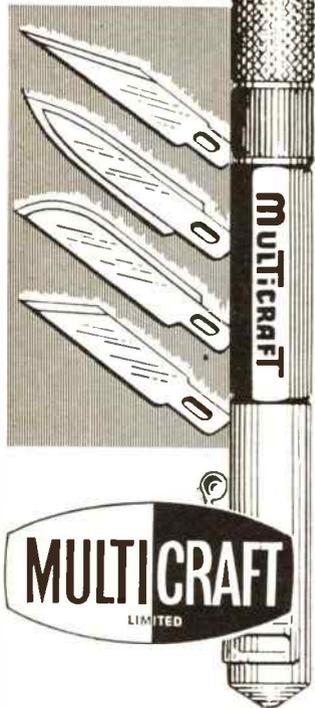
Flower holder

A log, a few feet of dowelling, and an aluminium baking tin can make the attractive plant or flower holder seen in

Fig. 7. The log is sawn in halves through the middle, and six holes are drilled in each half to take the dowelling, two on each side and two on the bottom. The baking tin fits inside the dowelling frame, with wire netting to hold the flowers, or cactus pots sunk in gravel. Paint the dowelling white, and the outside of the tin black. (A.L.)



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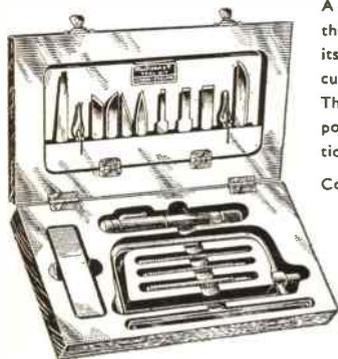
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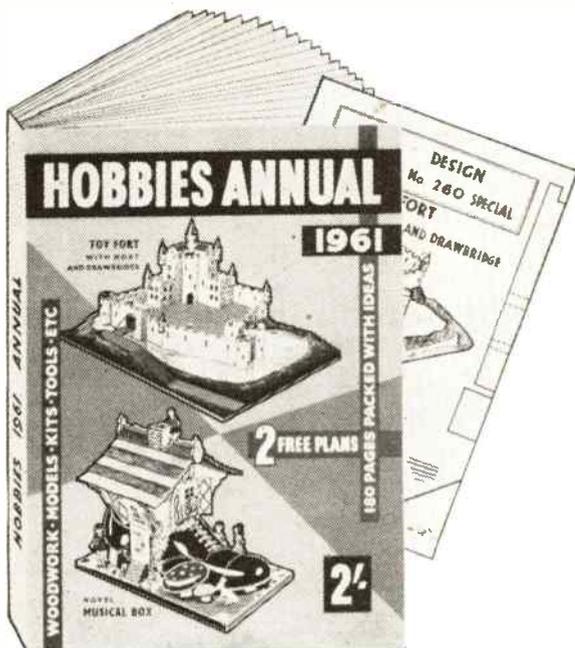
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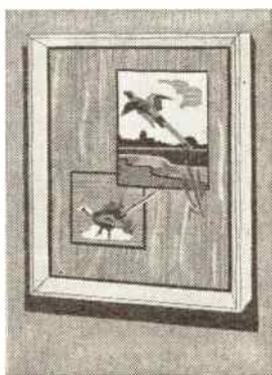
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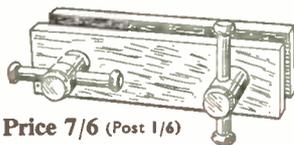
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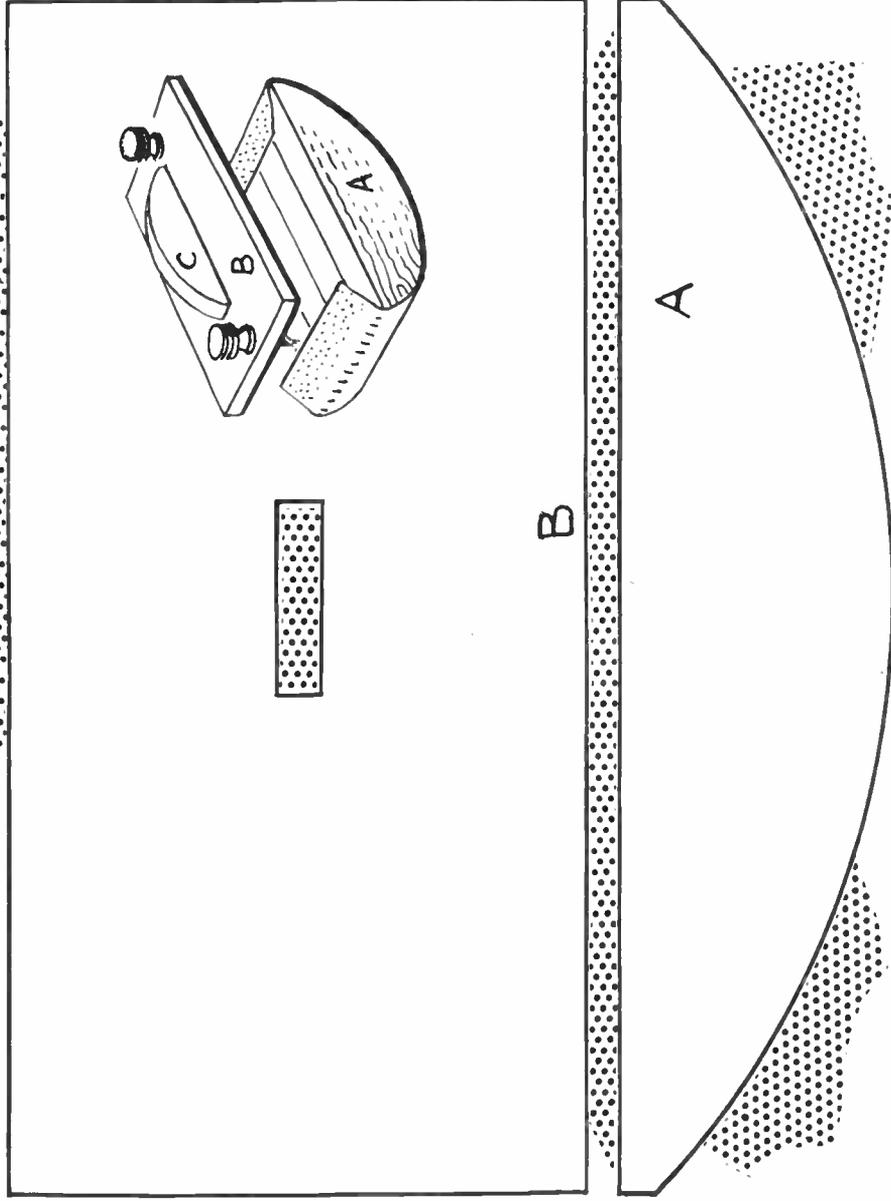
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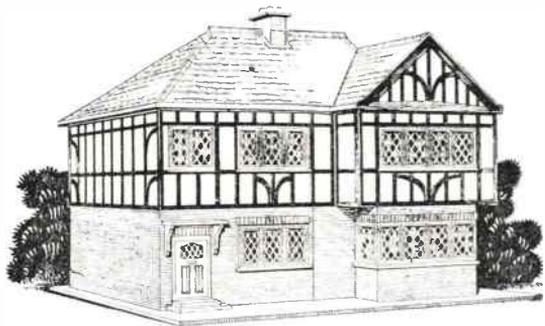
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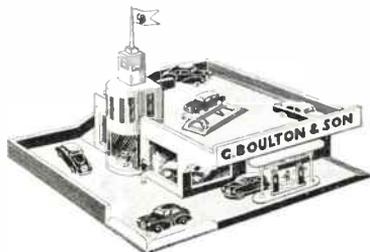


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9th NOVEMBER 1960

VOL. 131

NUMBER 3387

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HOBBIES *weekly*

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HOME CRAFTSMEN

**Full instructions
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AMPLIFIER

COLLECTOR'S CLUB

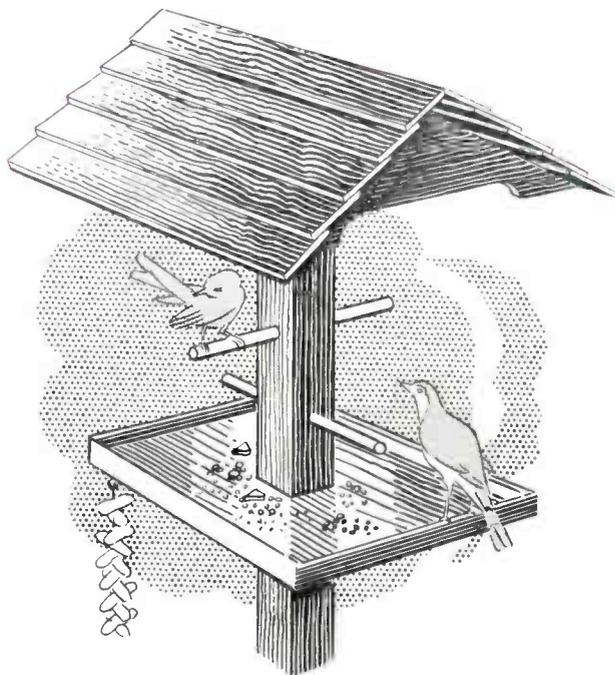
PATTERNS FOR
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A BIRD TABLE



Up-to-the-minute ideas

Practical designs

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World Radio History

5^p



two top matadors, Luis Dominguin and Antonio Ordonez, who were rivals, were meeting for the first time,' he says.

Neil is going to Turkey this year. He lives at 'Meon House,' near Titchfield, Fareham, Hants.

New Zealand reader

I HAVE just received some photos of Gisborne, New Zealand from regular reader Mrs Joyce Weir. Mrs Margaret Moore (Mrs Weir's sister) is

THE 'Kachina' dolls have been called 'Spirit Dolls', as they are used by the Indians in their ceremonial dances to the gods.

The Hopi Tribe live in Arizona. They are a religious people of simple faith. They believe in their Kachina dolls bringing them help from their gods as sincerely as we believe in prayer.

KACHINA DOLLS

The Hopi Indians have many religious ceremonies, handed down from their ancient chiefs. Kachina dolls are used in all dances as saints, statues and paintings are used in our churches.

Hopi Indians are noted for basket and rug weaving, silver jewellery and gem setting. Boys and girls carve Kachina dolls from the roots of the cottonwood tree. They paint them in bright colours. The paints are made from native plants. The colours symbolize the rituals of the dance and doll they represent, of departed spirits.

The Snake Dance and the Rain Dance are well known.

The Kachina head dress is made of bright feathers and decorated with beads, shells and silver.



Latest beer labels from the 'Home Brewing Company', Richmond, U.S.A.

He saw a Bull-fight

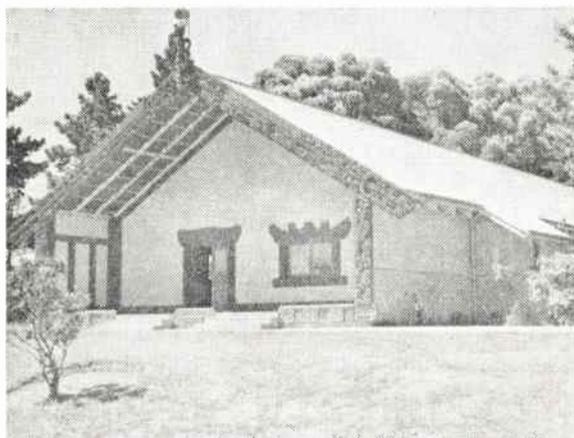
NEIL Smith has visited Spain three times. During the 1959 trip he saw a bull-fight (see illustration).

'It was a very famous bull-fight as the

now well known to many readers in England. So if you want to exchange English stamps and labels for those of New Zealand, write to: 13 Oman Road, Kaiti, Gisborne, N.Z. (R.L.C.)



He saw a bull-fight



Maori Meeting House, Gisborne, N.Z.

MAKING THE BIRD TABLE

A GARDEN which contains a bird feeding table is made much more alive and attractive with the various species of birds flying to and fro and arguing over dainty tit-bits. The making of such a table will be time and effort well spent in enabling you to enjoy the antics of our feathered friends, and thus ensuring that your garden will

have life and beauty even in the depths of winter.

The diagrams in Fig. 1 show the main dimensions and indicate the general construction. The table itself is fixed to a 2 in. by 2 in. main upright C, which is let into the ground about 2 ft. and stands about 6 ft. above ground. It should, of course, be well treated with wood preservative before putting in the ground.

Commence by making up the roof, consisting of two shaped ends A, and the roof pieces B. The shaped ends A are marked out on to $\frac{1}{2}$ in. wood, and cut out with a fretsaw. The roof pieces B are 18 in. long by 3 in. wide, and are cut from $\frac{1}{2}$ in. wood. They can be planed to give a suggestion of a feather edge if desired. The completed roof is shown in Fig. 2.

The pieces D which support the feeding table are cut from $\frac{3}{4}$ in. wood, and are shown in detail in Fig. 1. These pieces may be tenoned into the main upright C, or the tenons could be dispensed with, and the supports merely glued and screwed to C.

The table is constructed from $\frac{1}{2}$ in. wood, with sides about 1 in. deep, mitred round, as seen in Fig. 3. The hole in the middle is the same size as the upright, i.e. 2 in. by 2 in.

The sketch in Fig. 4 shows the supports D glued and screwed in place, and the holes drilled to take the perches H.

Slide the table down into position, and fix with a couple of screws to the supports D. Now push the perches H, which are pieces of $\frac{1}{2}$ in. diameter round rod, into the holes, and finally fix the roof.

To finish off give a coat of clear wood preservative, and paint green or brown. Use outdoor paint, giving an undercoat and one or two top coats. (M.h.)

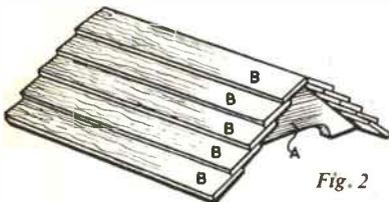


Fig. 2

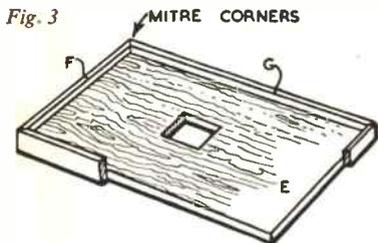


Fig. 3

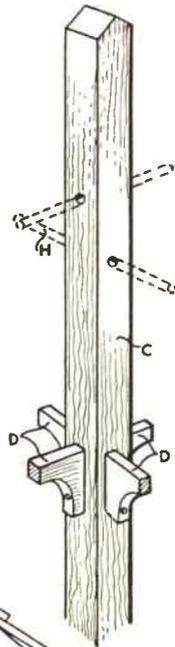


Fig. 4

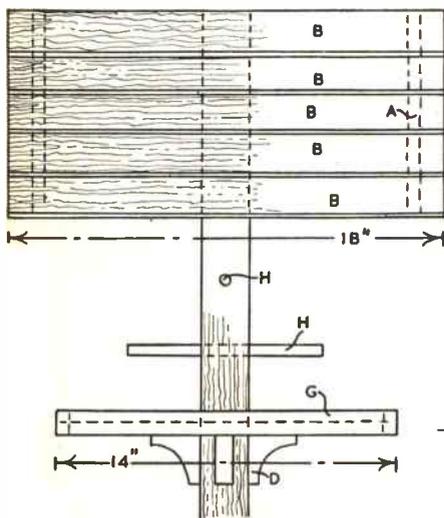
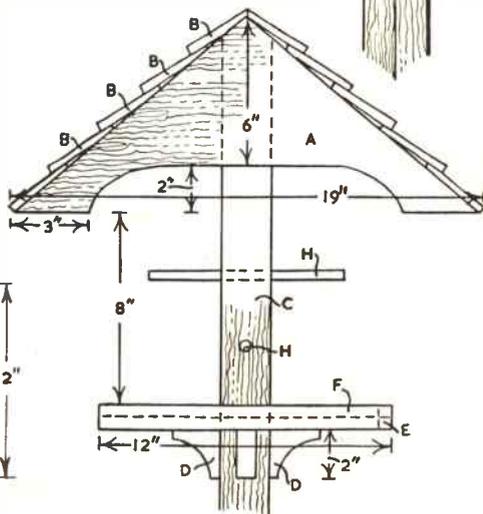
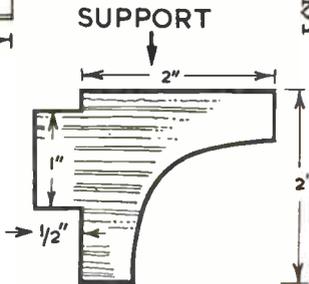


Fig. 1

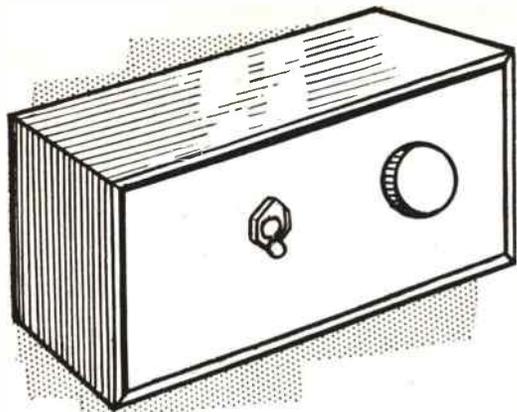


- SIDE VIEW -

- END VIEW -

Amplifier with Four Transistors

By
'Radio Mech'



THIS amplifier can be used for various purposes, as described later, and it runs from a 6V. or 9V. dry battery. As the four transistors can provide quite a high degree of amplification, a 6V. battery will usually be sufficient. More than 9V. should not be used.

The circuit is shown in Fig. 1, and has two stages (transistors 1 and 2), which drive a push-pull output stage (transistors 3 and 4). This type of circuit has the advantage that quite a good output volume is obtained. In addition, the current drawn by the pair of push-pull transistors depends on the signal they are handling. The working life of the battery is thereby extended, because the current taken falls to a low level except at those instants when a loud signal is passing.

The 5K potentiometer acts as volume control. A separate on/off switch is used because sometimes it is con-

venient to leave the volume set at a particular level. The output from the amplifier is taken to an ordinary 2/3 ohm speaker. If small size is important, a 3 in. or other midget loud-speaker can be connected. Otherwise a larger speaker unit may be used, fitted in a suitable cabinet. The same cabinet can also take the amplifier and battery.

The transistors

Transistors of various types can be used, with satisfactory results. Surplus Red Spot transistors are least expensive, and can give a reasonable output. These have Emitter, Base and Collector leads emerging from the bottom, a red spot denoting the Collector, as shown at A in Fig. 2.

In the output stages, in particular, Yellow/Green Spot audio transistors will allow a greater power output. These are shown at B, and it should be noted that Emitter and Base leads are

close together, while the Collector lead stands farther away.

Best possible results will be achieved if a reputable maker's named transistors are used, and C shows connections for Mullard OC72 output transistors, a red dot indicating the Collector lead.

If various audio frequency transistors are to hand, they can probably be used. But transistors 3 and 4 should be a pair of the same type, so that they work together to best advantage.

For ordinary purposes, satisfactory results can be expected if Red Spot transistors are used for 1 and 2, and a

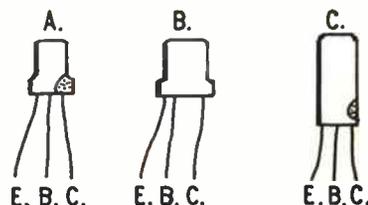


Fig. 2—Transistor connections

pair of Yellow/Green Spot transistors for 3 and 4.

If more expensive transistors are to be used, a matched pair of OC72's will do well in the output stage (3 and 4). A Mullard OC71 can be used as driver (transistor 2). If so, more amplification will be obtained if the 100K resistor is changed to 47K. Emitter bias can also be applied by wiring a 1K resistor and 50 mfd. condenser in parallel, and joining these in the emitter circuit, instead of taking the emitter directly to the battery positive side of the amplifier wiring. This may also be done in order to use an OC71 in the first position (transistor 1).

Whatever transistors are actually employed, it is necessary that Emitter, Base, and Collector shall be wired up to the correct points. It is also best to leave the leads their full length, and not to bend them near the transistor body.

Amplifier wiring

The amplifier can best be built upon one side only of a piece of paxolin about 3½ in. by 7 in. If a midget amplifier is required, it is quite easy to construct it on a smaller panel. Space can also be saved by mounting parts on both sides of the panel, but when this is done it is easy to make errors in wiring. For these reasons, a moderately large panel, with all parts one side, as shown in Fig. 3, is best from the point of view of easy con-

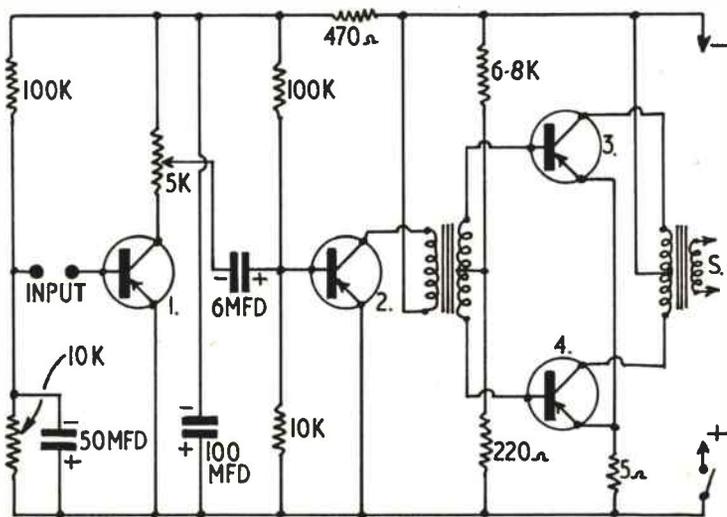


Fig. 1—The 4-transistor amplifier circuit

struction. The switch and volume control knob are then on the other side of the panel, so that the amplifier can be easily fixed in a cabinet.

A number of small bolts are used as connecting points, so positioned that in most cases the wire ends of resistors, condensers, and transistors can reach them directly. Tightly bolted connections are satisfactory. Soldering does, however, provide a more permanent connection, and a tag can then be held by each bolt, and used as an anchoring point. The hot iron and solder should only be held in contact with each tag or lead for a second or so, until the joint is made, as prolonged heating will damage the components. Transistor connections,

The centre-tap on the secondary of the driver transformer is connected to the 6-8K and 220 ohm resistors. The centre-tap on the primary of the output transformer is wired to battery negative.

The various transformer makers usually identify tags or pins by coloured dots, so these should be followed. Some miniature transformers have coloured flexible leads instead. The secondary of the output transformer is wired to two terminals, for loudspeaker connections.

Small, low voltage condensers and resistors, as used for transistor equipment, will be most satisfactory. Condensers for higher voltages, as used in battery and mains receivers, will be too large.

COMPONENT LIST

Small 5K volume control with knob.
On/Off switch.
1:1 push-pull driver transformer, transistor type.
8:1 push-pull output transformer, transistor type.
Fixed condensers: 6 mfd., 50 mfd., 100 mfd., transistor type.
Resistors: 5 ohm, 220 ohm, 470 ohm, 6-8K, two 10K, two 100K.
Transistors: see text.
Paxolin panel approx. 3½ in. by 7 in. Doz. 6BA or 8BA nuts and bolts.

and the secondary to the amplifier.

Carbon microphones need to have both a transformer and battery. Microphone, battery, and transformer primary are wired in series. (A switch may be included, to avoid disconnecting the battery.) The transformer should be of low resistance, with a low ratio, and its secondary is connected to the amplifier.

If a crystal set is to be amplified, its earth line should be connected to the bolt E in Fig. 3. The amplifier input terminals are then connected with a short piece of wire. The 50 mfd. condenser is disconnected, and used to couple the crystal detector to the input terminal (B on transistor 1). Alternatively, a complete coupling circuit can be wired up, if it is preferred not to change the amplifier.

If the amplifier is to be used permanently with a small transistor receiver, for speaker reproduction, the simplest method is to omit transistor 1 entirely, and to take the Collector of the receiver transistor to the 5K volume control.

The amplifier is suitable for use as a baby alarm. For this purpose, a low impedance microphone, placed fairly near, is best. The amplifier and speaker can be at any reasonable distance, and connected with a long twin lead.

A simple 2-way loudspeaking telephone, or inter-communications unit, can be arranged by using two small loudspeakers, with a 2-way switch to connect them to amplifier input or output terminals, as required.

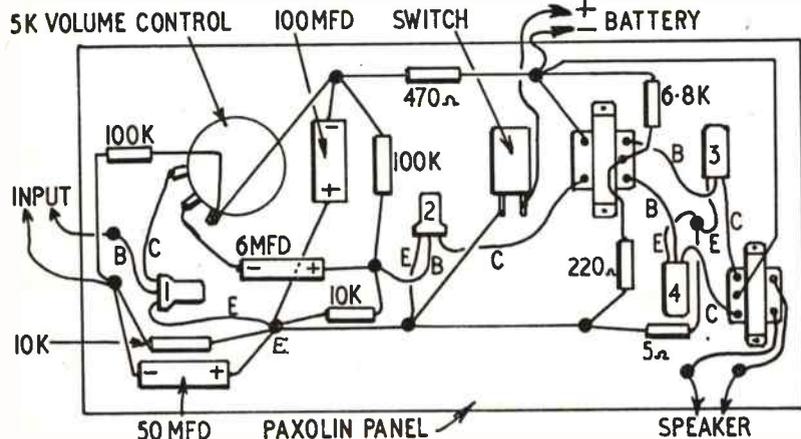


Fig. 3—Wiring plan of the amplifier

in particular, should be soldered quickly.

Thin insulating sleeving should be placed over the various wires, to avoid any chance of short circuits. Flex is used for battery connections, and these must be identified, so that the battery is always fitted in the correct way. If a transistor receiver type battery is used, it is best to connect the battery leads to the special kind of plug which fits the battery, as this cannot be inserted the wrong way.

In Fig. 3, Emitter, Base, and Collector leads are marked E, B, and C. With transistor 1, Emitter goes to battery positive (via switch), Base to one input terminal, and Collector to volume control. With transistor 2, Emitter goes to positive, Base to 6 mfd. condenser, and 100K and 10K resistors, and Collector to the primary of the driver transformer.

Transistors 3 and 4 have Emitters connected together, and to the 5 ohm resistor. Each Base goes to one secondary pin or tag of the driver transformer. Similarly, each Collector is taken to one primary tag of the output transformer.

Wiring should be checked against Fig. 3 before connecting the battery. If not mis-used, transistors are almost everlasting. But if wrongly connected, or supplied with current in the wrong polarity, they may be damaged.

The bushes of volume control and switch are long enough to pass through a second thin panel, and this will conceal the bolt heads. This second panel forms the front of the case.

Input connections

The input impedance of the amplifier is not very critical, but best results are obtained with a fairly low impedance input. A low impedance microphone can thus be connected directly to the two input terminals. A low impedance ear-piece, or a small loudspeaker, can be used in the same way, but will not give quite such good results as a proper microphone.

A high impedance unit, such as a crystal pick-up, crystal microphone, or high impedance earphone, should have a matching transformer. The primary of this is connected to the pick-up or mike,

Next week's free design

will be for making a
musical cigarette box

in the shape of a gondola.

Make sure of your copy.

Build yourself a Village—(2)

WE will now assume that you have prepared the village site as described in our issue of November 2nd and are ready to commence operations. You will remember that we suggested the use of empty matchboxes for the buildings, and there are sound reasons for this. Firstly, it means that all our buildings are going to be on the same scale, a rather important factor; we can avoid quite a lot of con-

structional work, and finally there are so many possible variations either by cutting the tops differently, or using in combination, that we can make all kinds of buildings.

Let us examine a common twopenny matchbox of the cardboard type for a moment. You will see that one side is of double thickness where the joint is made, and with the aid of a pointed knife it is possible to open this joint without

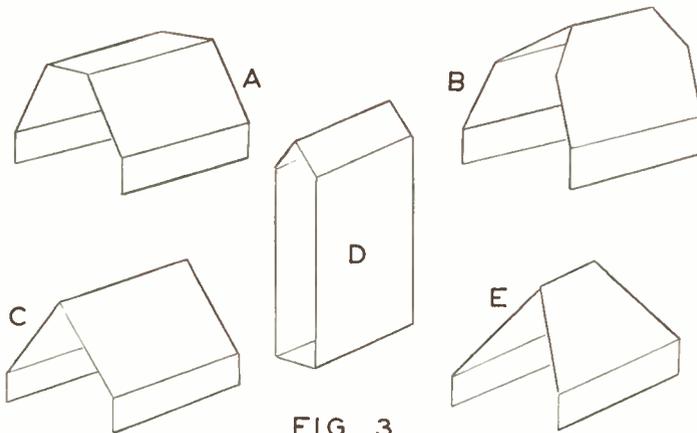


FIG 3

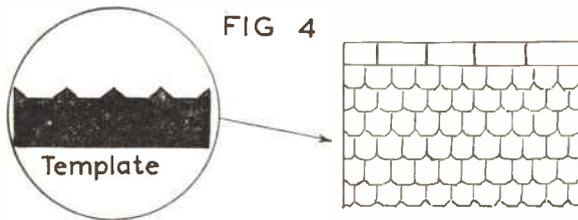


FIG 4

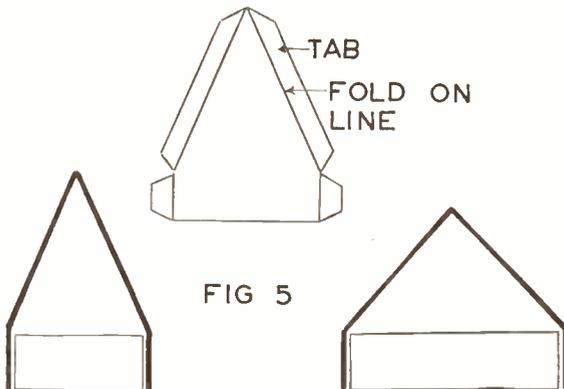


FIG 5



On the left we have a matchbox opened as stated in the text while on the right is a model of a house

damage. Reference to our diagrams will reveal the many different shapes of house or buildings we can make from matchboxes after such treatment. Fig. 3A shows the shape of the box after opening the joint, a plain structure but with a flat top, while B has been trimmed at the ends to alter the gables. When the top side has been scored along the centre, and the sides pressed together, we produce a building, as shown in C, while D is a taller variety made by using the unopened cover and erecting a roof on top. This may be used as a tower in conjunction with shape A, to make a church, while E shows a further modification of the gable ends.

When the tray is returned within the outer cover it adds support, and Fig. 5 indicates how the tray may be fitted in its original position, or turned to make a wider, but lower house. The cover is glued to the sides or ends of the tray, as the case may be. In both cases, however, the gable ends remain open, so we prepare a piece to fit, as shown. The end of a house is laid on a piece of stiff paper, and the outline traced. Allow about $\frac{1}{4}$ in. margin for the tabs, score, and fold when the gable end may be attached to the main structure, the tabs being glued to the outside of the matchbox cover.

Although our miniature houses appear to be of the same pattern, they can be varied in many ways either by altering the gable ends, as shown in Fig. 3, the

position of the tray (Fig. 5), or by making the front of the house along the narrow side. As an example a few houses could be arranged together, so that we have a long side and a narrow one, a change of gable end, and so on, as shown in Fig. 6, and this will avoid monotony. Moreover, we may also join two or more houses together to make a row or a larger structure for a hall, school, church or tower. Such joints can be made by means of paper gumstrip on the inside of the covers before fitting the gable ends, and attaching to the trays.

We cannot overlook the chimneys for our houses, but these are simple to make either from stripwood or thin cardboard folded like a matchbox, and attached to one end of the house.

Decorating the outside of the little structures is perhaps, the most fascinating part of the project, and there are two alternative methods at your disposal. You may use differently coloured pastel papers, e.g. cream, light brown or brick, preparing pieces to fit the gable ends and strips to cover the whole of the roof and walls, adding the details in water colours, and pasting on the models. If you adopt this method see that the strips are accurately measured, and folded where necessary. These folds should be at the apex of the roof, and where the latter joins the walls, and they will prove a useful guide. The gable ends can be treated to incorporate beams as in these old buildings, and this part is glued to the matchbox before adding the strip for the roof.

The roof and front of the house are made on the one strip, and if you will refer to Fig. 4, you will see that we provide an illustration of a tiled roof. In the accompanying circle is a template you can make, which speeds the preparation of this detail work. All you require is a strip of cardboard a little longer than the roof cut out, as shown. The template is laid on the roof portion, and the outline of the tiles sketched, as shown. If waterproof indian ink is used for such detail work, you may add a wash of terra cotta water colour to finish.

There are some advantages of adopting this method of decoration, for the paper can be treated while it is flat on a table, but do be sure that your measurements are quite accurate.

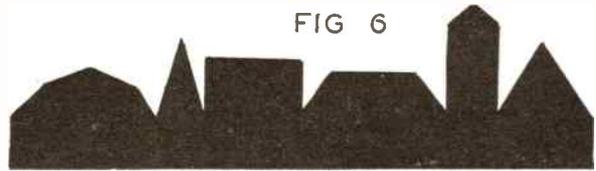
The other method is to first cover the structures in a suitable pastel paper, then adding any decorations as may be desired. In both instances you must use a good quality of paper, and if white is used, you may colour the house to any desired shade. You may also buy brick-work paper from Hobbies, which is ideal for walls, but remember to vary the colours of the houses as much as possible. When the decorations have been completed, the house may be glued

into position on the base.

The grassy fields can be represented by sawdust glued to the base, and coloured green, while the same material may be used for paths. Trees are made from small twigs. These are stripped of their normal leaves, and pushed into small holes drilled into the base. A little glue will hold them in position, while a little green sawdust will give the impression of foliage.

Lamp standards are made from thin pieces of wire fixed in the base, the lamp

Your houses may have small gardens with lawns and flowers — the latter will be artificial, of course, while you may erect a clothes line in another, with some paper washing hung out to dry. The village pond may be nothing more than a small mirror, and you are sure to want a few animals in the fields. Toy motor cars, etc. can be placed on the roads, which are either walled or fenced, and, no doubt, many other ideas will quickly come to mind. Remember that the barber's shop will require the dis-



being made from a small piece of stripwood. Nameplates should be made for the roads, streets, and shops. You will also note that we have provided for a signpost at the road junction, but this should not present any difficulty if stripwood and cardboard is used.

As the project proceeds, and your village is taking shape, there are many other small details which may be added.

inctive pole, while tiny stalls will be required in the market place.

This business of building a village is a fascinating hobby of planning and erecting that you may enjoy for a long while, and since so many odds and ends can be used, and empty matchboxes cost nothing, it is not an expensive project.

(H.M.)

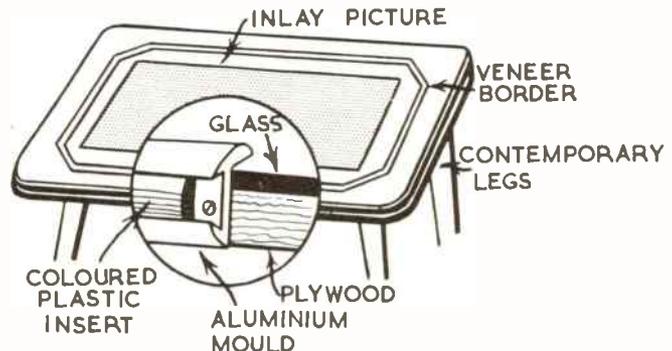
A MARQUETRY TABLE TOP

AN interesting project suggested by Mr H. Webber of 4 Creek Street, London, S.W.11, concerns the utilization of a marquetry picture as a table top.

Mr Webber used as a basis our design for making a marquetry tray, entitled 'The Landmark,' given in our issue of March 9th. He worked the picture on $\frac{1}{2}$ in. plywood and extended the top as suggested in the illustration, giving a $2\frac{1}{2}$ in. radius at the corners. Over the

picture was placed a cut piece of 28 lb. glass held with a strip of 'Herzim' around the outside. This aluminium moulding is easy to bend. Contemporary legs were screwed at the corners.

Materials used were 20 by 15 by $\frac{1}{2}$ in. plywood base, 6 ft. of aluminium moulding, veneers, 20 in by 15 in. glass (again cut rounded at the corners), and four legs, the total project costing less than 35/-.



A FILING CASE FOR NEGATIVES

EVERY photographer quickly discovers that he amasses quantities of negatives, the subjects varying from the casual snapshot to the pictorial. They may remain in their wallets, left in old envelopes and stuffed in drawers, which entails a tiresome search or sorting of the entire stock if only one is required for a print. Apart from the fact that this wastes time it is not good for the negatives so the question arises as to what is the best method of storing and filing.

When a picture is taken it is not always immediately realized that the negative may become precious, but a little reflection will show that this is so. A child study taken now may prove most interesting in ten years' time and we may capture architectural subjects which may be demolished in the years ahead. And if you take your hobby seriously you may be interested in collecting pictorial shots of the places you visit.

There are albums available for storing negatives and while these are useful for a time the keen worker will find that the limited capacity is soon exhausted and further provision must be made for the expanding stock. Moreover, we are still confronted with the task of searching through the album.

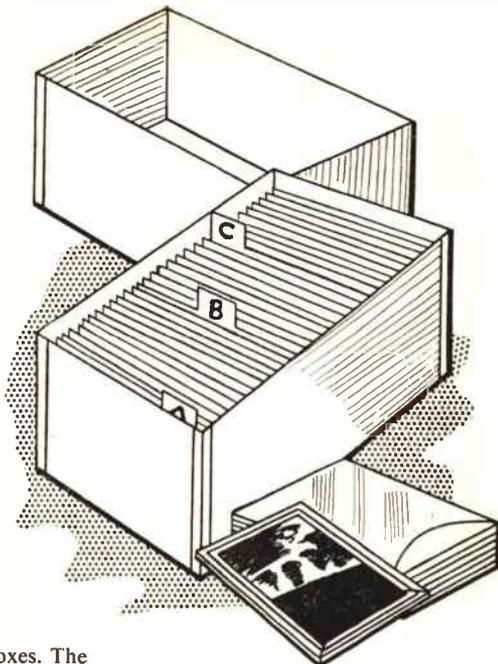
The only solution is to tackle this problem early and in a sensible manner, using a simple filing system which will allow expansion in all fields of photography. And from small beginnings you may build up an easy filing system accompanied by a card index which is nothing more than a set of transparent

**KEEP THEM
NEAT AND
TIDY FOR
EASY
REFERENCE
SAYS**

H. Mann

envelopes kept in cardboard boxes. The transparent envelopes can be purchased quite cheaply — about 1s. 6d. per hundred in different sizes to suit your negatives — and these are superior to ordinary paper envelopes for many reasons. They are thinner, the negatives can be seen without withdrawal and more important still, they are free of injurious chemicals normally existing in paper.

At the start we should decide on what should be stored and what should be discarded. This is no great task, for fuzzy negatives and damaged ones should be thrown away immediately. But before any are stored you should be satisfied that they will keep without deteriorating. This means that thorough fixing and washing is essential after development,



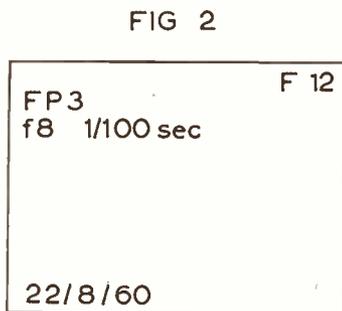
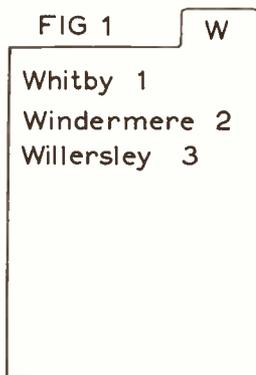
for the partially washed negative will assume patchy brown stains and deposits of any remaining chemicals. In brief, there is nothing can be done about such damage, which will only appear some years after processing.

If you process your own films and you are sure they are properly washed there is nothing to fear and by this we mean a thorough washing of at least 30 minutes in running water. If you are doubtful you can also give your films a test for hypo after washing by this method.

Prepare a solution, or obtain from a chemist the following: Potassium permanganate 9 grains, Sodium carbonate 12 gains, water 20 ounces. Place the film in a dish containing a small volume of water, leaving for about three minutes so that any traces from the film are transferred to the water. Take $\frac{1}{4}$ oz. of this water adding 1 drop of the above solution. If the sample water turns pink and remains pink the washing is complete.

Normally, in classifying negatives, you will find that there are three main groups — portraits, landscapes and architectural studies — so they may be segregated and filed immediately into separate envelopes. Here we should mention that while it is advisable to use one envelope per negative you may use your own judgment. A danger of inserting two or more is that of scratching when removing one for printing.

The next step is arranging each class of negative into some order for storing and



filing. We find that it is best to store negatives stood on their edges instead of on top of one another because the latter method would cause the negatives to rub, with consequent damage. So we first place the separate negatives into their own envelopes and proceed to sub-divide them alphabetically for quick reference.

In the portrait section we may have a negative of brother Fred and one of friend Peter Smith, and if we prefer eliminating the waste of searching we arrange the negatives in alphabetical order. A set of tabbed index cards lettered accordingly is now inserted between the sorted negatives. Some letters bear quite a number of envelopes in their sections while others have few or none. So to overcome this difficulty we introduce a numbering and card index system.

Each envelope in each section is numbered as shown in Fig. 2, starting at number 1 of course and continuing for the whole batch. When numbering the envelopes it is as well to prepare a tabbed record card at the same time. An example is shown in Fig. 1 and you will see that this bears the letter, the names of the subjects and the numbers of the appropriate envelopes in the section.

Returning to the examples of Fred and Peter Smith. For the sake of illustration we will assume that we have a fairly large batch of negatives under both F and S. Fred's negative is in the envelope marked F12. (Fig. 2). You will now observe that on requiring a particular negative we have only to examine the appropriate card which directs us to the

corresponding numbered envelope. Peter Smith's negative is filed in the S section, envelope 22 — again entered on a card.

This is the simplest form of filing that can be devised for rapid recovery of a particular negative. Technical data can also be included as shown.

We can assemble our landscape negatives in the same way as portraits. As the stock of landscapes grows they may be divided into the four seasons and the key record cards altered accordingly or we may use differently coloured cards. Another useful practice is a cross reference.

Earlier we mentioned three main groups of subjects but these may be

found not sufficient and once more we can sub-divide into such classifications as seascapes, nature, animals, castles, historical, abbeys, bridges, sports, still-life and miscellaneous.

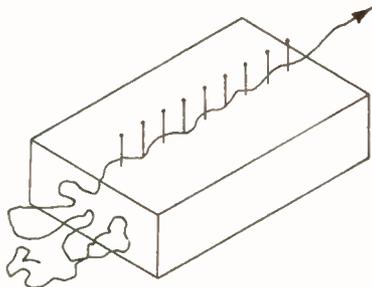
When the envelopes and record cards have been prepared the stock should be placed in boxes so that the negatives are stood on their edges. If you cannot obtain boxes of a suitable size it is a simple matter to make them from thin cardboard, while the record cards can be kept separately.

There is very little involved in filing if it is made a regular practice and it is a real time saver when one has to make a repeat print in a hurry.

STRAIGHTENING KINKED WIRE

LIGHT gauge wire, such as fuse wire, sometimes becomes badly kinked, particularly if it is carelessly stored in a tool box or drawer. The sketch shows how it can be straightened out by means of an easily made block. This consists of a short piece of timber about 1 in. thick with a row of panel pins inserted at intervals of about $\frac{1}{8}$ in. The pins should not be driven fully 'home'. The kinked wire is woven through the pins and then pulled through from one end. You will find that the wire will come out quite straight and free from kinks.

(F.K.)



An Instrument for Skiffle Groups

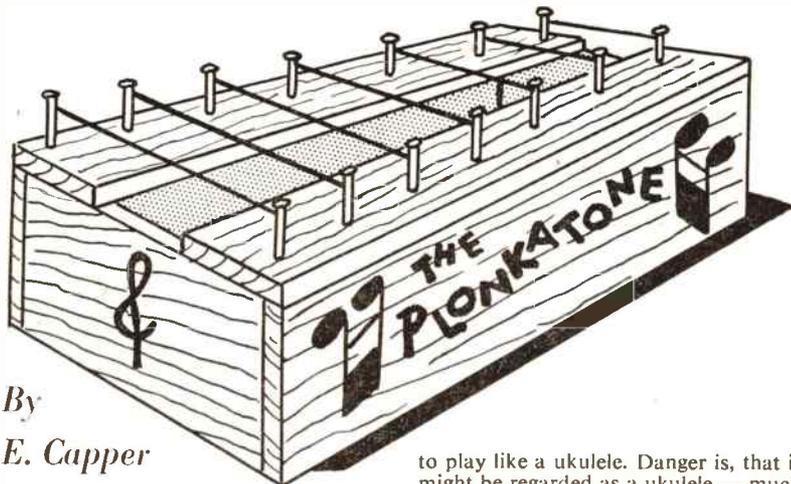
CALLING all you skiffers. Here is a new instrument to use. Called a 'Plonkatone' it will give that little extra to your group, and get the 'cats' gathering around!

Construction is simple. A strong, deep seed box will do for the sound-box. It should, of course, be well planed and glasspapered. Nail two strips of wood across the open top, so that a gap of about 2 in. is left running down the centre.

Into the strips knock two rows of nails, each pair immediately opposite one another, but with the distance apart gradually reducing down the instrument. You can have as many pairs of nails as you wish.

Between the pairs of nails stretch lengths of varying thicknesses of wire, and bind taut. Base notes will require thick wires, etc.

The instrument is played by plucking at the wires, or you can make up a simple plectrum from perspex. If you

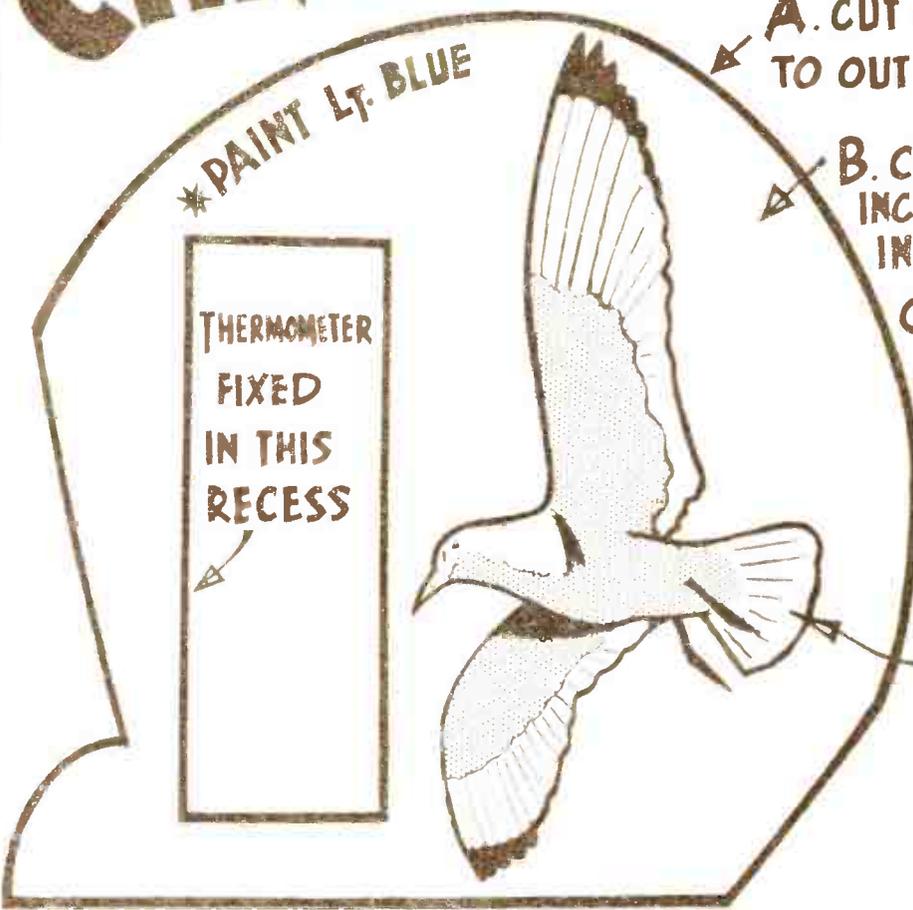


By
E. Capper

wish you can add an arm to the under-side of the box, and hold the Plonkatone

to play like a ukulele. Danger is, that it might be regarded as a ukulele — much too 'square' for the modern skiffle group!

NOW IS THE TIME TO START MAKING DELICIOUS CHRISTMAS GIFTS

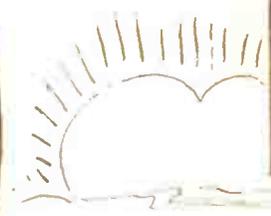


* PAINT LT. BLUE

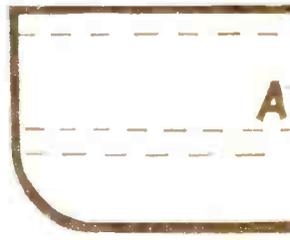
THERMOMETER
FIXED
IN THIS
RECESS

A. CUT ONE 1/2" TO OUTLINE ONLY

B. CUT ONE 1/8" INCLUDING INTERIOR CUT. GLUE TO A.



DECORETTE TRANSFER No. 4

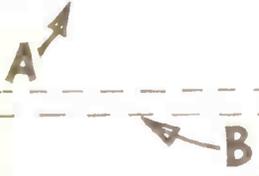


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BASE C. CUT ONE
1/2 IN.

Hobbies
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