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THE ORIGINAL
'DO-IT-YOURSELF'
MAGAZINE

HOBBIES *weekly*

FOR ALL
HOME CRAFTSMEN

Also in this issue:

- MINIATURE
GRAM AMPLIFIER
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FOR MODELS
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YOUR GARDEN PETS
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WITH A CAMERA
- PLANS FOR A
DOLLS HOUSE TV
- ETC. ETC.



*FREE
plan
inside*

**LORD'S
PRAYER
TABLET**



Up-to-the-minute ideas

Practical designs

Pleasing and profitable things to make

World Radio History

5^p



FOR an unusual theme try collecting stamps and labels depicting hats. (See illustrations)

Canadian stamps of 1893 depict Queen Victoria as a widow, her small crown surmounting a widow's cap and veil.

If interested in royal headwear, begin with our Coronation stamps of 1953 showing the Queen wearing her crown and Robes of State.

AN UNUSUAL THEME: HATS

National head-dresses are favoured by all countries. Not only on stamps, but labels and cards too.

Sports fans will find straw boaters, Bathing, hunting, cricket and many other caps on stamps and brewery labels. But remember to include the various protective hats used in sports, like crash-helmets, etc.

In Austria, people of different regions or even villages have their own quaint and pretty hats. Many of these are illustrated on stamps of 1948.

Now turn to the Vatican for stamps depicting religious hats. Do you recognize the cardinal's hat, the bishop's mitre and the priest's biretta?

The first mention of hats in England occurs in a wardrobe account of Henry III. Most of us can visualize the beaver hats worn by Edward III and his courtiers. Hats were introduced in France under Charles VI. But they only came into general use under Francis I.

Spaniards commenced manufacturing hats in England in 1510. Tall crowned hats were worn under Elizabeth I. Low crowned hats with broad brims were introduced in 1700, and three-cornered hats in 1704.

When you have completed your 'hat-trick' see how many stamps and labels you can find depicting hair-styles, combs, etc.

He prefers agates

'I am a collector of marbles, coins, and stamps,' writes Otton Wengar of Germany.

Otton, who is twelve years of age, likes 'agates' best because, he says, 'they are made of coloured glass.'

'I run errands for people', he continues, 'and one day a man gave me some real china marbles for taking a message. Some of them are painted in bright colours which don't rub off.'

Clear glass marbles are made by taking up a little melted glass on the end of an iron rod and giving it a round shape by dropping it into an iron mould.

An animal design is sometimes put on the end of the rod. It is dipped into the melted glass which flows all round it. In the finished marble the animal is seen shut up.

Coloured glass marbles are made by holding a bunch of glass rods of different colours in the furnace until they melt. The workman then twists them round into a ball or presses them in a mould. When done the marbles are marked with bands and ribbons of colour.

Have you guessed that marbles are so named because they were first made of marble?



Theresa Stokes

'My main hobby is friendly correspondence with people all over the world,' writes Theresa Stokes, of 32 Oakrout Avenue, Great Dunmow, Essex.



Tony Robinson

Tony Robinson collects match labels. He is looking forward to hearing from other readers. So put his name on your list now. Write to 40 Railway Terrace, Willington, Crook, Co. Durham.

John Frost, another regular reader who is eager to receive news from fellow hobbyists, lives at 40 Brograve Road, Tottenham, London, N.17.



MINIATURE GRAM AMPLIFIER

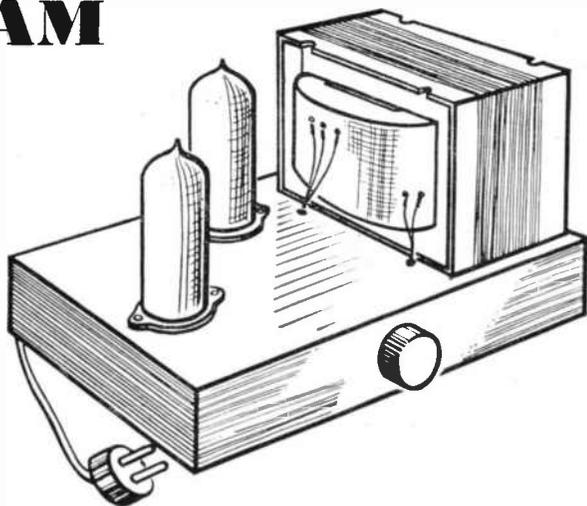
THIS amplifier is of small size, and can often be accommodated in an existing turntable or loudspeaker cabinet. This makes the equipment independent of a separate amplifier.

The circuit is shown in Fig. 1, and uses a single valve (the ECL82) as audio and output stages. This arrangement provides enough gain for an output of $1\frac{1}{2}$ watts or more, with a 100mV input. That is, if the pick-up employed with the record player is rated as having an output of 100mV (0.1V.) or more, satisfactory loudspeaker results can be obtained. In practice, this means that very many popular pick-up units will be satisfactory. The remaining valve (6X4) is the rectifier. Current is drawn from a transformer, to avoid any danger due to the chassis or leads being alive with mains voltages.

If the unit is to be constructed as a separate amplifier, the pick-up is plugged into the sockets shown, and the loudspeaker is fed from the leads provided. The amplifier could then be enclosed in its own small cabinet.

The amplifier is, however, primarily intended to fit inside the case of simple record players. Such players have a mains-driven motor, with turntable and pick-up, but no amplifier. When using them, the pick-up has to be taken to an external amplifier (which will usually be run from the mains also). The loudspeaker is then connected to this external amplifier. But when the unit described here is incorporated in the

By
F. G. Rayer



record player cabinet, the external amplifier is no longer necessary. Instead, the loudspeaker is simply connected to the combined player/amplifier. A record player of this kind, with its own internal amplifier, is thus seen to be very convenient.

It is also possible to incorporate the amplifier in the loudspeaker cabinet, as mentioned. If so, the leads from the pick-up in the record player are simply taken to the combined amplifier/speaker.

The unit has a single control, acting as on/off switch and for volume adjustment. Leads to this are screened in such a way that the actual control can be situated almost anywhere, as proves convenient. For example, it may be on the turntable motor-board, or fitted to the front or side of the speaker cabinet.

COMPONENT LIST

ECL82 valve. 9-pin noval holder.
6X4 valve. 7-pin B7G holder.
Mains transformer with 250/0/250V. 60mA and 6.3V. 1½A. secondaries.
1 megohm volume control with single pole switch. Knob.
Fixed condensers:
0.01µF mica; 0.01µF paper; two 25µF 25V. bias condensers; 8µF 350V; 32µF 350V.
Resistors:
220 ohm 1-watt. 1.7K 5-watt.
2.7K ½-watt. 220K ½-watt.
1 megohm ½-watt.
1 ft. screened wire. Chassis. Pick-up socket strip.

Component details

All parts needed are given in the component list, but one or two items require special note. The mains transformer is the largest part, and a fairly compact one is necessary, to keep size down. A fully-shrouded chassis-mounting transformer with suitable outputs would be about 3 in. by 2½ in. by 3 in. The complete amplifier can then easily be constructed on a chassis 6 in. by 3 in., or smaller, if necessary.

If plenty of space is available, there is no need for compact construction, of course. But when the amplifier is to be accommodated in a player cabinet, overall dimensions must be watched, due to the space taken up by the motor and other fittings. A transformer with higher current ratings than those given (say, 75mA HT, and 2A for heaters) will be equally satisfactory.

If the player is equipped with a co-axial or jack plug, it is more convenient to fit a co-axial or jack socket on the amplifier, instead of using the twin socket strip. Such sockets can be easily

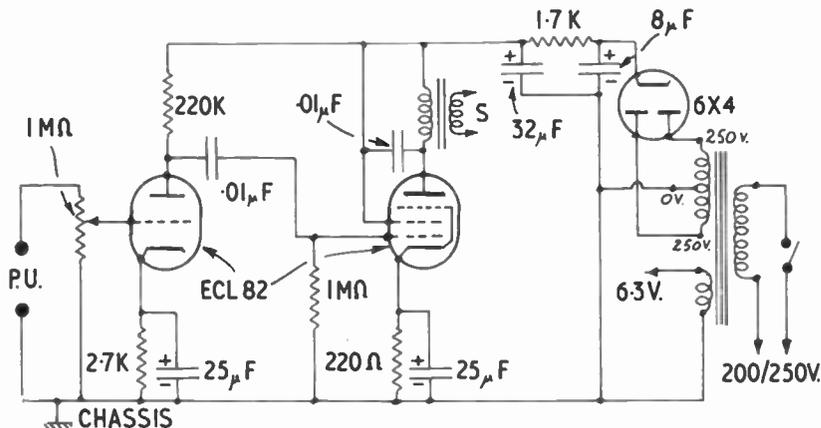


Fig. 1—The gram amplifier circuit

To wire up the volume control, prepare the lengths of screened lead by unplaiting the wire braid for about 1 in. at each end of the lead. This can easily be done with a small pointed tool. Twist the unplaited strands together, to form pigtailed. Remove the covering of the insulated central wire for about $\frac{1}{2}$ in.

The central lead of one screened wire goes from tag 1 of the volume control to one pick-up socket. The central lead of the other screened wire goes from tag 2 of the volume control to socket 1 of the 9-pin valveholder. Then twist together both pigtailed at one end, and solder these to tag 3 of the volume control. In the same way, join both pigtailed at the other end to the chassis tag E. This tag is wired to the remaining pick-up socket.

If a co-axial or jack socket is used, take the central connection to the insulated lead which goes to tag 1 on the volume control.

The two screened leads to the volume control can be of any reasonable length, and the control can be removed from the amplifier, and fitted at any convenient spot. When this is done, join tag 3 to the mounting bush, to avoid hum due to the spindle not being earthed.

Other connections, not already mentioned, may be checked as follows: Socket 2 of 9-pin holder to 220 ohm

resistor and positive of $25\mu\text{F}$ condenser. Socket 3 to 1 megohm resistor and $0.01\mu\text{F}$ mica condenser. Socket 6 to $0.01\mu\text{F}$ paper condenser and speaker transformer. Socket 7 to speaker transformer, H.T. positive line, $0.01\mu\text{F}$ condenser, and 220K resistor. Socket 8 to 2.7K resistor and positive tag of $25\mu\text{F}$ condenser. Socket 9 to $0.01\mu\text{F}$ mica condenser and 220K resistor.

Make careful, neat, soldered joints, so that short circuits will not arise between adjacent tags. When several wires go to one tag, make sure *all* are properly soldered.

Loudspeaker

When the loudspeaker has an output transformer fitted to it, simply take the two leads shown in Fig. 3 to the primary of this transformer.

If the speaker is a moving coil model without a transformer, the latter must be added. For the usual $2/3$ ohm speaker, the most suitable transformer ratio is about 40:1, and the primary should be intended for mains valves, or rated to carry at least 50mA.

The primary of the transformer is connected to sockets 6 and 7 of the 9-pin holder. The secondary is wired to the speech-coil tags of the speaker.

When the transformer is separate from the speaker, it is usually pre-

ferable to mount it on, or near, the amplifier chassis. Short leads then pass from sockets 6 and 7 to the primary. The secondary can be taken to a twin socket strip, so that the leads from the speaker can be plugged in. With this method of connecting up, no H.T. voltages will be present in the speaker leads.

Remember that the speaker cannot give proper results unless it is fitted in a cabinet, or employed with a baffle board. The actual size or shape of the cabinet is not very important.

Notes on working

With the equipment connected up as explained, and the volume control turned about half way, reproduction from the speaker should begin as soon as the valves have warmed up.

The amplifier may be used with a carbon or other form of high output microphone. It will also be satisfactory with a radio tuner, for listening to broadcast programmes.

Remember to keep the mains leads clear of the pick-up leads, and associated wiring, or mains hum may be heard through the speaker. It is unlikely this trouble will arise, unless the layout is very careless. If it does, it can easily be identified, because the hum will fall in volume when the volume control knob is turned back towards zero.

Show Cases for Models

FOR the purpose of displaying small models to good effect, the easily-built cases described in this article serve excellently, and get over the 'museum' look that is unavoidable when we have to build a case for a large model.

For miniature galleons, cars, and similar small models a simple case made of picture glass, as in Fig. 1, is suitable. Make the base first in a nice quality wood and polish to a fine finish. If you cannot cut your own glass a local glazier or ironmonger will do it for you, but make sure you give the exact measurements by determining the gauge of your glass, and allowing for the ends to be cut shorter by twice the thickness of the glass, to allow them to fit between the sides. The top piece must be cut to fit flush over the two sides and the two ends. No measurements are given because each case must be made to suit the size of each individual model.

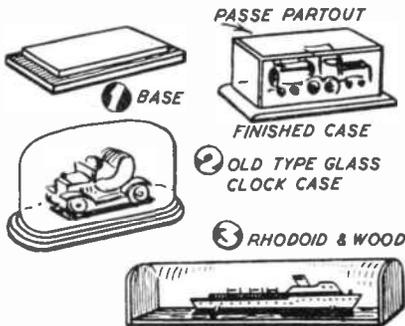
The glass case is made to be a tight fit over the upper base to exclude dust; it can be left just fitted over or can be cemented in place.

An improvement, if you have the tools for the job, is to groove the base to take the glass. The glass is covered with

passee partout at the edges, and you will find that it makes a firm and clean-looking job.

For housing small models there is a ready-made case that looks very well and unusual. Watch the secondhand and junk shops for one of the old glass clock cases. They are usually domed at the top, as in Fig. 2, and in various sizes. If you can pick one up and make a model to fit the case nicely, it makes an excellent ornament.

And now for our second case — to house waterline models of ships, liners, etc. Again no measurements are given.



Design the size of your case to fit the model for which it is intended.

The case is shown in Fig. 3. First make the base and ends of wood, and assemble them. The edges of the ends can be left plain or can be rabbeted to take the acetate sheeting which will be used. Polish the woodwork nicely, and mount the model in position. In the case of waterline models, the sea can be modelled direct on to this base instead of a separate base. In the case of full hull models, the supports can be mounted direct on to the base of the case.

For the case proper, acetate sheeting (or Rhodoid) as supplied by Hobbies Ltd. is recommended. It is firmer than celluloid, and if well cleaned before attaching in position, is very clear. It can be fixed in position with a contact glue, which also gets over the trouble usually encountered with the material springing. After the sheeting is glued in place, the ends can be finished with passee partout or a thin strip of veneer polished to match the base, and glued in place over the ends.

An alternative method of fixing, although needing patience, is to groove the ends to take the sheeting. First fix only one end on the base. Place the glass substitute in position, and then screw the second end into place. This allows for the removal of the model at any time. (E.)

PUZZLES TO MAKE AND DO

PUZZLES, like good magic tricks, have a peculiar fascination which appeals to our human love of mysteries and of all things curious. A baffling problem that defies solution tends to be a source of injury to our pride, and we cannot relax until the answer becomes apparent or the suspense is relieved and, mercifully, we are told how the puzzle may be done. The

By A. E. Ward

ardent poser of puzzles is well aware of these facts and delights in exploiting the discomfiture of his bewildered friends. Here are three unusual items that involve the manipulation of simple apparatus.

'From Last to First' is a puzzle with letters of the alphabet. Make a set of letters, exactly as illustrated, which will spell the word 'last' when laid out upon the table. Copy the letters upon thin plywood and cut them out with a fret-saw. Let the first letter be 4 in. high.

Last

Smooth the wood with fine grade glass paper, and paint each letter in a different bright colour. Lay out the completed letters to form the word 'last'. The object of the puzzle is simply expressed. You must merely change 'last' into 'first', doing as you wish, without damaging any of the letters.

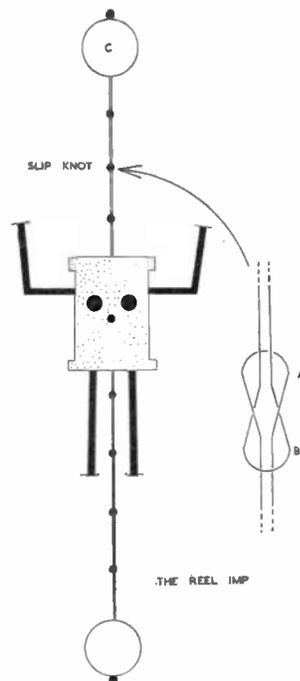
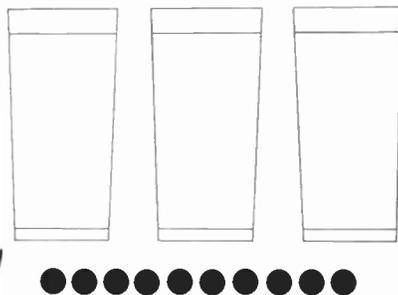
Do not read any further. Try the puzzle yourself, using letters cut out of

Next week's issue will contain projects of interest for all ages —
Make sure of your copy.

paper. The solution is in the last paragraph of this article.

A conjuring trick performed since ancient times has inspired the title of the second puzzle. For 'Cups and Balls' you must provide yourself with three paper cups, or teacups, and ten marbles. Can you place an odd number of marbles in each cup without adding to, or subtracting from, your total of ten marbles? If you are a mathematician you will declare that this cannot be done, but you will be wrong. The solution is stated in the final paragraph.

The 'Reel Imp' is an amusing novelty puzzle with a subtle method of solution. Unfortunately you must learn its secret in order to construct the puzzle, but you will enjoy using it to confuse your acquaintances. Make the imp by driving four 2 in. nails into a cotton reel and bending the nails, with pliers, to resemble a set of limbs. Bore two holes where the eyes will be and insert large sawn-off nail heads into the little sockets, to serve as eyes. A cobbler's nail will suffice to provide your imp with a nose.



When the imp is trapped upon the strings, between the beads, your puzzle will be ready for use. Hand the apparatus to a friend and ask him to remove the imp without disturbing the knots at the end of the string. Say no more than that. Unless he observes the slip-knot his efforts to release the imp will be of no avail. Of course the puzzle may be solved by reversing the manipulations employed when you joined the strings at the start.

If you are still puzzled . . .

If you are still striving hard with 'From Last to First', here is the solution. Take away the second letter of the word 'last' and arrange the remaining three letters to form the abbreviation 'lst'. Note that the clumsy shape of the first letter is deliberate! There are no fewer than fifteen solutions to the 'Cups and Balls' puzzle, though every correct answer involves the same catch. Here is one solution. Place three marbles in the first cup, two in the second, and five in cup number three. Now for the catch. If you put cup number one inside the second cup, the latter cup will then 'contain' a total of five marbles. Nothing was said about not being able to nestle the cups in this manner! Finally, can you make a list of the other fourteen methods of distributing the ten marbles?

LOOKING AFTER YOUR PETS

THE hedgehog is familiar to most folk, for he is conspicuous by his prickly jacket. He — or his wife and children — make jolly nice pets, but be careful how you look after them. If left loose in garden or enclosure, they will wander off if they get the chance. They will squeeze through railings, or dig beneath a fence.

Keeping a hedgehog as a pet is very cheap, for it will look after itself without much assistance from you. It must be remembered, however, that no hedgehog can be expected to live and thrive on a diet of cockroaches and beetles only.

Feeding a hedgehog will not cause much trouble, for all that is needed, besides what it picks up when outdoors, is a little fresh bread and milk each morning, and some scraps of raw meat during the day. If permitted to roam in the garden, it will pick up all sorts of vegetable food. A meat bone is also appreciated.

Safe quarters

A hedgehog is better kept in an out-house or suitable shed. It should be provided with a heap of straw or hay in a corner where it can establish its own quarters. When allowed to roam in the garden, see that there are no gaps in the fences through which it can walk, for hedgehogs are natural wanderers. You can bring the creature into the kitchen or scullery at night if troubled with beetles, and you will soon be free from them. Remember, hedgehogs do practically all their foraging for food nocturnally.

When winter approaches, provide your prickly pet with a pile of old leaves, ferns or grass. The animal will cover itself with these materials and sleep soundly during the cold months. Do not disturb the sleeper. It will come forth when the spring sun warms the earth again. As an alternative, you can let your pet burrow into a mound of earthy soil, or hide up in some convenient hole.

Tortoises

Now here is a most interesting creature, which readily becomes a pet. It is very amusing to note how a tortoise gets to know you, and pops his head out of his shell on hearing your voice. He will live a long time, too, if you treat him properly, and is not expensive to keep.

If you have a garden — all the better. It is advisable, however, to net off a piece of turf for him. It is surprising how a tortoise will squeeze through a hole, or even climb over a sizeable obstruction.

Although a tortoise appears to move slowly, he can cover amazing distances when he wants to. In case your hard-shelled pet does wander off and get lost, it is a good idea to scratch with indelible pen, or paint, the name and your address on his shell.

Feed a tortoise on greens, lettuce, peas, beans, pods, dandelions, clover and similar greenstuff. Keep him in the garden, but beware! — he likes strawberries, and quickly finds them.

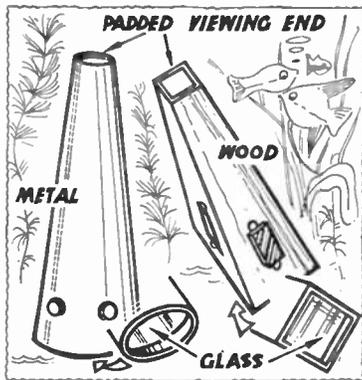
A tortoise in a garden with herbaceous borders can do a lot of harm during the summer, so it is essential to restrict his roaming. A small box in a corner of your plot, filled with leaves and grass, and a wire netting enclosure about 10 in. to 12 in. high will stop him from wandering. Or make a 'run' on part of the back lawn, if possible. In the centre of the 'run' place an enamelled soup plate and sink it in the ground to the rim. Keep this filled

with water. Keep a handful of his favourite garden-stuff inside the place netted off. A little bread and milk won't do him any harm.

Tortoises do not like wet, so when rain is around, provide shelter for him. They like warmth in cold weather.

When winter comes, your pet will seek a place for hibernation. You can construct an artificial burrow 1 ft. or so deep, in a warm, sheltered corner of the garden, or if you have a cellar free from frosts, you should place a handy wooden box filled with earth and covered with a layer of leaves. A greenhouse is another possible place to keep him. If your greenhouse is regularly heated throughout the winter, however, your tortoise won't want to hibernate, but will keep fully awake, in which case you will need to feed him and in very severe weather bring him indoors at night. (E)

MAKE A WATER TELESCOPE



THAT vast expanse of the world covered by water totals about three-fourths of its area, and contains many wonders not seen on land. This article describes how to make an instrument through which can be seen many of those wonders and curiosities of water life in their native haunts.

The water telescope, made of wood or metal, will enable anyone, when one end of it is partly submerged, to see objects in the water that would otherwise be invisible. It is astonishing how water becomes as transparent as air when viewed through these simply made instruments.

If using tin or zinc, fashion a funnel about 3 ft. or 4 ft. long, 8 in. or 10 in. in diameter at the bottom, and wide enough at the top to cover both eyes of an observer. Lead or metal sinkers should be attached to the bottom to counteract the buoyancy of the air which is contained in the funnel, and they also help to submerge the big end. Paint the inside of the funnel black to prevent the light from being reflected on the bright surface of the tin. Should it be found difficult to insert a circular piece of glass at the bottom, a frame can be fitted to take a square piece instead. Either should be made watertight, of course.

Should it be more convenient to make the telescope of wood, all that is necessary is a long wooden box, approximately the same dimensions as the metal one. Paint the inside black and fix the glass to the bottom end of the box, cutting the small end to fit comfortably round the eyes.

Whether metal or wood is used, the small, or observing, end should be padded with a soft material or rubber for ensuring a better fit for the eyes and for comfortable viewing.

A water telescope will add greatly to the interest of a nature study outing, giving a unique feature that is sure to be popular in showing under-water life. (E.)

Illustrated on front page

THE LORD'S PRAYER TABLET

IN response to many requests, we have pleasure in introducing this design for a Lord's Prayer Tablet. Measuring 19 in. long by 9 in. wide, it is suitable for church or home, and with the words of the Prayer standing out quite prominently, will make a very decorative feature. Keen church workers will find much pleasure in thus introducing their handiwork to their own church; and this is a subject which would be suitably appropriate on the walls of a bedroom, particularly that of a child.

Accurate fretcutting is involved in the overlays at the top, sides and bottom, and these will exercise the capabilities of keen fretcutters. Hobbies kit contains the lettering printed in white on clear plastic sheet for adding to the board, but those accomplished with the fretsaw might also like to cut out the lettering in wood or plastic to be glued on as overlays. We would only recommend this to the more experienced fretworker.

The makeup of the tablet consists of a backboard, then comes a piece of coloured flock paper on which is placed

the sheet of lettering. This flock paper backing brings out the words in fine detail and gives a very colourful, though dignified effect. Finally, the printed sheet is held in place to the background by a framing of $\frac{1}{4}$ in. wood. The assembly is shown in detail on the design sheet.

Hobbies kit of materials provides for the backboard to be made from two panels which are butted and glued together to give the required width. The join is covered by the wording and overlays. If working from your own materials, however, this piece 1 can be cut from one piece of wood.

Having cut the shape of the baseboard, trace and transfer the decorative overlays on to the wood, which throughout is $\frac{1}{4}$ in. Cut them out as neatly as possible with a fretsaw and clean up. Piece 2 is positioned at the top, piece 4 along the bottom, and pieces 3 down the sides. Similarly pieces 7 are cut and added in the projections at the top of the sides. Pieces 5 and 6 form the framework for the lettering and can be cut to be added later.

A KIT for 12/9

Hobbies Kit No. 3406 for making the Lord's Prayer Tablet contains panels of wood, acetate sheet with printed lettering, and flock paper. Kits price 12/9 from branches etc, or from Hobbies Ltd, Dereham, Norfolk (post 1/9 extra)

Position the flock paper on the baseboard as indicated, and lay the sheet of acetate lettering on top. These are kept in place by pinning and gluing the framing all around as shown on the design sheet.

A project of this nature would look dignified with the exposed woodwork stained and polished or varnished.

The best way to set out Ellipses

HOME handymen are sometimes called upon to carry out repairs involving the cutting out of elliptical shapes. The success of such jobs depends largely on the careful and accurate setting out of the desired shapes. Although there are many different ways of setting out ellipses the method described here is probably the best for the practical handyman.

Stage 1. All ellipses have two diameters, or axes — major and minor. The lengths of these axes determine the total length and breadth of the ellipse. The first thing to do, therefore, is to set out these two axes on your material, as shown in the sketch, so that they intersect at a central point O.

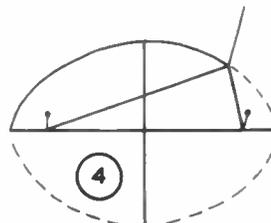
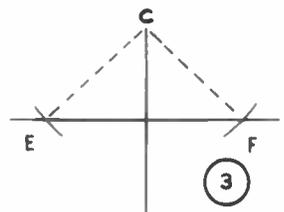
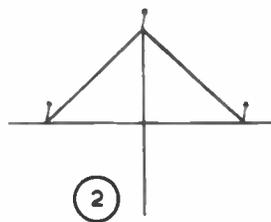
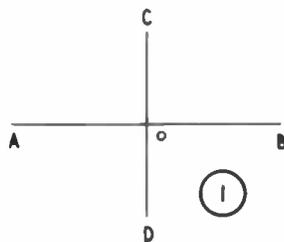
Stage 2. Assuming that the size of the ellipse is too large to use a pair of compasses, take a piece of string with a pencil at one end, and set it to half the length of the major axis, i.e. the length AO. Now place the free end of the string at the point C, and strike arcs to cut the major axis at the points E and F. Thus AO equals OB equals CE equals CF.

Stage 3. Insert three panel pins or short nails into your material at the

points E, C, and F, and join them together with a piece of fine twine.

Stage 4. Remove the panel pin or nail from the point C, and replace with the point of a sharp pencil. Keeping the

twine always pulled taut at its maximum distance proceed to trace out the curved pattern which will prove to be a true ellipse passing through the points A, B, C, and D. (F.K.)



MAKE IT A HAPPY HIKE

LITERALLY hundreds of people will be striking the road on foot at Easter, for hiking is a great sport if carried out intelligently.

Like every other worthwhile effort, hiking requires a little forethought and organization. Thus to walk comfortably for a considerable distance one should really have 'trained' to some extent. Muscles do not take too well to sudden prolonged exercise after weeks of a perhaps not too active job, or even school. If there has not been much chance, therefore, to get 'into trim' do not make the Easter walks too long. Many beginners at pedestrianism, as it was once called, quite spoil early hikes by attempting too much.

Your feet are like the tyres of a car, so look well to them. Always walk in boots, not shoes, no matter how well they fit. Shoes invariably chafe around the upper edge in time, and slip up and down on the heel to a certain extent. This slip may not be noticed to start with, but it is there and will eventually cause a sore heel. Boots are in effect suspended from the ankle and so cannot slip. Well dubbin the boots, however, both to make the leather soft and to help in resisting damp.

Applying Vaseline to your toes and heels — and any other parts that seem to take the rub — also helps to avoid blisters. Leave some on the skin. Wear thick, undarned, woollen socks. Thin socks or those lumpily darned, are asking for trouble. Carry a second pair in the rucksack. Soft, clean socks are a major secret of foot comfort when hiking. Never keep on walking with a blister forming. Stop and remove the cause.

In the actual walking, take a firm steady step and never let your progress degenerate into a shamble. If this stage is reached, stop and rest. It is good to take rests at regular intervals, whether tired or not — say five minutes at the end of every half-hour. If the ground is dry, lie out and relax for this period. For sustenance between actual meals, plain chocolate is hard to beat. Drink only sparingly.

Include in your gear an Ordnance Survey map of the area being covered. One inch to the mile is a suitable scale. This will be a friendly guide always and in addition will give a lot of interest.

With regard to footpaths, do not take all shown on the Ordnance Survey map as being necessarily public. They will be there certainly, for the O.S. maps are very accurate, but they may not all be 'rights of way', perhaps being private tracks going to cottages off the road. Thus you may be stopped somewhere on

their length and turned back — which can waste time and be rather irritating, for nobody likes to be caught this way.

It is good to plan the route stage by stage ahead, and if in doubt about any path, to inquire locally. Apart from anything else, trespassing does not help the cause of hiking in general, and should if possible, be avoided.

Tracks marked as 'bridle paths' or 'bridle ways' are open to the pedestrian as well as to horses — but not to wheeled vehicles. They can be walked over at all times even if shut off at intervals by gates — a common practice in cattle and sheep country to prevent straying. It is interesting to know that official bridle paths are never less than eight feet wide.

Now about that bull in the field you want to cross. Is it safe or inclined to be savage? Some counties have a by-law preventing farmers grazing bulls of more than a year old in a field through which runs a right-of-way footpath. This practice, however, is not countrywide by any means, so don't say 'It must be safe, or it wouldn't be there'. Use discernment in the matter, and if there is any doubt, err on the cautious side for a hostile bull can be truly nasty.

Do not take short cuts off a path. The path alone is for your use, not the fields around. If there are a number in the party, walk in single file, especially if there are shooting crops in the field. Making a path wider and wider by careless use can waste a lot of land, and it is

not fair to the farmer. Later in the year, remember that walking through young crops and grass that is up for mowing, is doing definite damage. It is this sort of thing that makes land owners detest walking parties. So do be careful.

Always, too, close gates that have to be opened for one reason or another. Straying cattle can waste a lot of the farmer's time and can also be a source of danger. Never climb over a gate if there is a stile handy or the gate can be unhooked. Remember, a gate is only hung by two hinges, though it may look strong. If there is no stile and the gate will not unfasten, then you have to climb over, but do so at the hinged end, for here the least strain is caused. Never push through hedges.

If your hikes will all be of day duration only, and home again at night, the question of accommodation will not arise. Should you want to walk for several days, however, the matter becomes important and the hiker cannot do better than take advantage of the facilities offered by the Youth Hostels Association. This body has a large number of hostels about the country, many set in 'chains' somewhere round fifteen miles apart. A night at a hostel is inexpensive and one meets people who are also 'on the road' — itself an interest. Full details of how to make use of the hostels can be obtained by sending in the coupon below. (E.)

cut it out!

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*Please send me free booklet "Going Places?"
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cut it out!

TAKE CANDID CAMERA SHOTS

By
S. H. L.

fashions. He made a box to fit his camera, wrapping it up in brown paper and string but leaving a hole for the lens, another for a long cable release and another for winding on the film. Armed with this parcel he went into the streets, positioning himself on a bench ready to snap at random. Unfortunately, he could not alter the speed or aperture to meet changing lighting conditions and his attempts were not really successful. Later he discovered that the best way was the easiest, that is, going about the job as usual, as though he was taking shots of buildings, and oddly enough, no one seemed to notice him!

The camera must be ready for action at any moment and this means pre-setting of the shutter, aperture and focus. First of all we must deal with speed. It will be realized that if we are standing quite casually awaiting the appearance of a subject, action must be swift when the opportune moment arises. In practice you will find that 1/250 second is the most likely speed you can use with success although you may be able to cap-

A shot of a market trader enjoying a quiet spell. Taken from a corner. 1/250sec., f/8, FP3.

YOU may have seen the television feature 'Candid Camera' where pictures of people are taken in all kinds of situations. These are for entertainment and usually humorous but they cannot be regarded as true candid camera photographs as practised by pressmen. More often than not the situations are pre-arranged, whereas in true candid photography the pictures are taken on the spur of the moment by alert photographers.

The resulting pictures are quite informal but are sincere reflections on life in all its phases. There may be moments of happiness, despair, excitement, even tragedy, all glimpses into the lives of real people. If you analyse some of these pictures, which appear in newspapers and magazines, you will find that they have been taken wherever people congregate. There is little or no restriction of choice, for it is the odd moment we try to capture when the subject is relaxed and off guard.

On holiday you will find children playing on the beaches, while at home there may be pictures in your own street. Shopping centres provide plenty of subjects, as do railway stations, parks, carnivals and all kinds of festivities.

You may think that candid photography demands a precision, miniature camera, capable of doing wonderful



These children on the beach were too intent on their play to notice me with a camera on a nearby deck chair. 1/250 sec., f/8, FP3

things. But there is no such thing as a universal camera and it is always the man behind the instrument that counts.

A friend of mine once went to some considerable trouble to obtain candid shots showing new styles in ladies'

ture some shots at 1/100 second if you can manipulate the camera into taking position and hold it steady. It is suggested that the shutter is set at this speed of 1/250 second whenever possible.

Adjustment of the aperture is related

to both focusing and lighting but there is little doubt that the smaller stop will give greatest depth of field compensating for any errors in judgment of distance. If you work with an aperture of $f/8$ on average days or $f/11$ on brighter days you should have adequate depth.

We have to focus on a particular spot where a subject is likely to appear and the best method is to select some particular base for yourself, say a street corner, focusing on the place where you expect a good shot to be taken. With a little patience something is bound to

turn up. The success of candid photography depends on catching the reactions of people in particular circumstances and these are more likely to arise where people have occasion to interest themselves in somebody or something. A shop window is a good example. Another example of this will be found on a fair-ground where faces and eyes turn upwards to watch friends on chairplanes or a big wheel.

You may have to persuade some patient friend to accompany you on your expedition, and as he stands with

his back to your live subject you take a shot through a space made by a bent arm.

Do not be disappointed if your early efforts are not too successful. You may find that you have been too far away, so the remedy is to try for a closer approach. And do not forget that you must watch your backgrounds or you may have a lamp standard growing from someone's head. You will find that candid photography offers a real challenge to your skill and initiative.

Interesting Locos—No. 31

THE 'TEUTONIC' COMPOUNDS

PROBABLY the most successful of all the three-cylinder Compound express locomotives designed by Mr F. W. Webb for the L. & N.W.R. were the 7 ft. 'Teutonic' class.

There were ten engines in the class, their numbers, names and building dates being as follows: 1301, 'Teutonic', March 1889; 1302, 'Oceanic', May 1889; 1303, 'Pacific', June 1889; 1304, 'Jeanie Deans', July 1890; 1305, 'Doric', March 1890; 1306, 'Ionic', June 1890; 1307, 'Coptic', June 1890; 1309, 'Adriatic', June 1890; 1311, 'Celtic', June 1890 and 1312, 'Gaelic', June 1890.

A notable engine of the class was the 'Jeanie Deans' which was shown at the Edinburgh Exhibition in August 1890. She was sent to the Exhibition as a new engine, representing the latest design of express passenger engine on the L. & N.W.R. and she carried her Crewe Works number 3105 especially for the

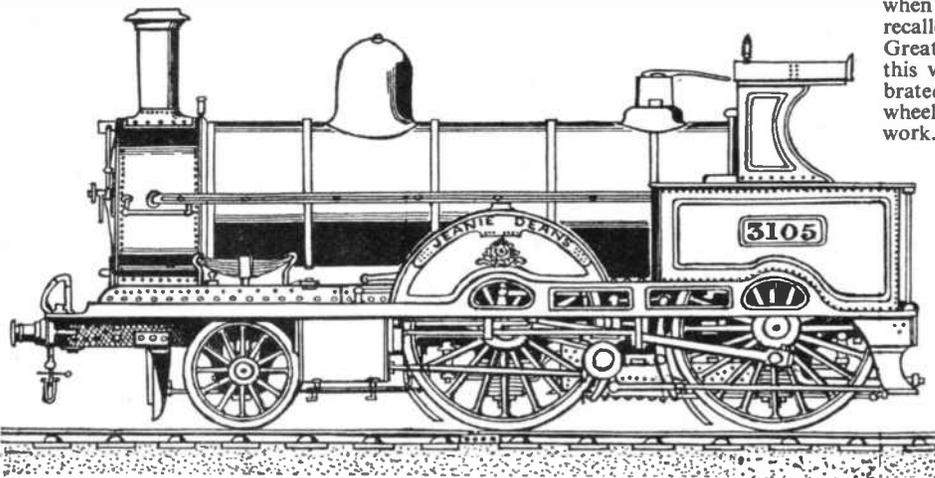
occasion. After the exhibition she was given her running No. 1304, and for almost the rest of her working life 'Jeanie' regularly hauled the 2 p.m. Euston—Scottish Corridor express, leaving Euston for Crewe daily and returning with the up Scottish express from Crewe at 7.38 p.m. From 23rd December 1890 to 5th August 1899 the engine ran 567,784 miles on this duty.

On the last day of the Railway Race to the North in 1895, No. 1309 'Adriatic' made the run between Euston and Crewe at an average speed of 64.3 miles per hour, an excellent performance, but of course surpassed by that of the 2-4-0 'Precedent' class, engine No. 790 'Hardwicke', which took the same train through to Carlisle from Crewe at an average speed of 67.2 m.p.h. over a more difficult road with regard to gradient. 'Hardwicke' is of course now preserved as a locomotive of historical interest.

In 1895, an experimental, non-stop run between Euston and Carlisle was made, and No. 1306 'Ionic' successfully accomplished this feat, covering the 299½ mile stretch without incident or mechanical trouble.

The 'Teutonics' carried the following details — type 2-2-2-0, Cylinders: two high-pressure 14 in. dia. and 24 in. stroke; one low pressure 30 in. dia. and 24 in. stroke. Boiler heating surface, 1401.52 sq. ft. Grate area 20.5 sq. ft. Working pressure 175 lb. p.s.i. Joy valve gear was provided for the high-pressure cylinders, the low-pressure valve being operated by the slip eccentric.

Mr Webb did not, of course, use coupling rods for any of his three-cylinder Compounds, and they were at times notoriously bad starters. He however held the view that whilst coupling rods were useful when starting they were a hindrance and a handicap to an engine when running at speed. It may be recalled that Patrick Stirling of the Great Northern Railway also held this view when designing his celebrated eight-foot bogie single-wheelers for main line express work. (A.J.R.)



London & North Western Railway. Crewe No. 3105 'Jeanie Deans.' The Edinburgh Exhibition engine of 1890.

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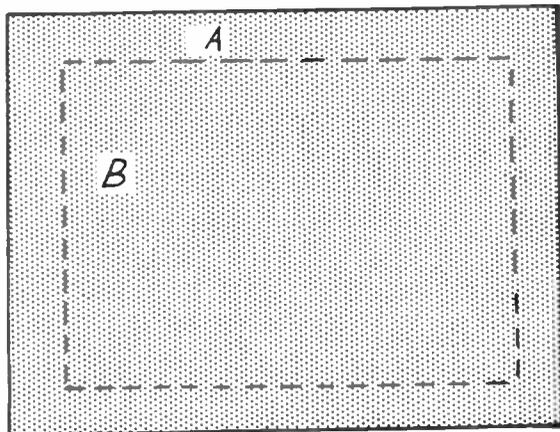
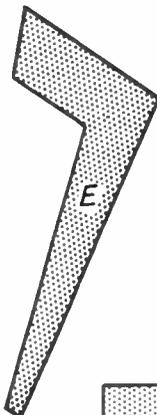
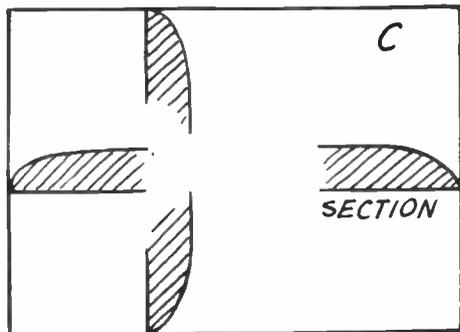
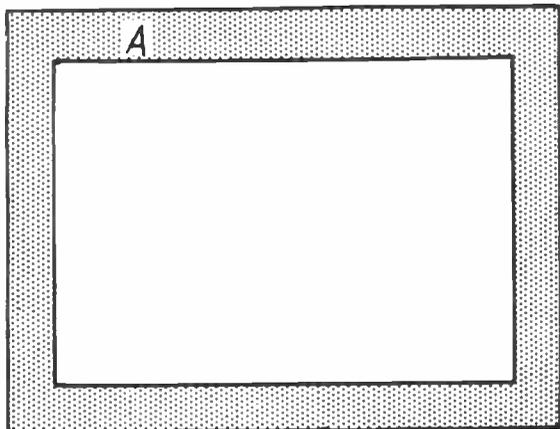
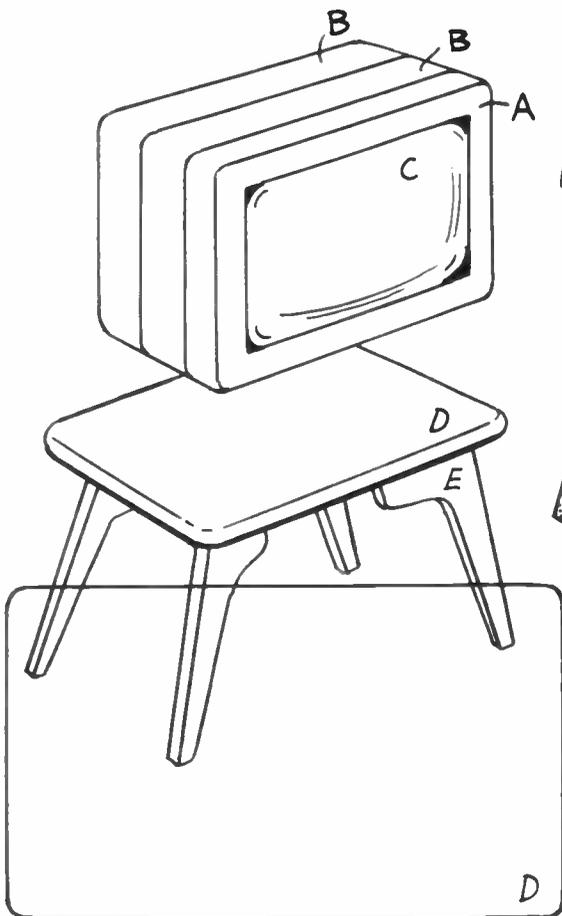


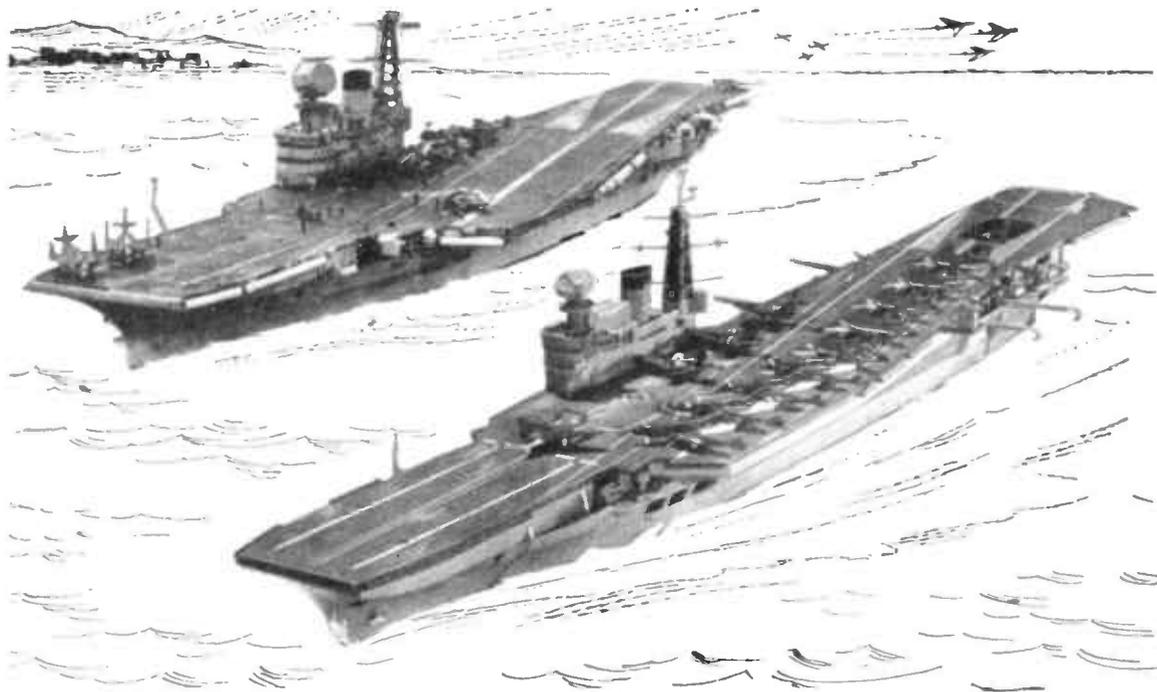
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CUT one piece A and one C from $\frac{1}{4}$ in. wood with a fretsaw. Cut two pieces B from $\frac{1}{2}$ in. wood. Shape piece C as shown and glue the pieces together.

The table top D, and the legs E, are $\frac{1}{4}$ in. thick. There will of course be four legs required.

Clean up with fine glasspaper and finish by staining and polishing. (M.p)





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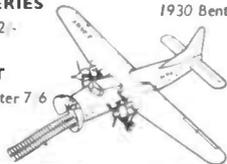
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PIECE 7. CUT ONE 1/4 in.

2

ACETATE C
TO THIS L

PIECE 6. CUT ONE 1/4 in.

PIN



OUR FATHER
WHICH ART IN HEAVEN
HALLOWED BE THY NAME
THY KINGDOM COME
THY WILL BE DONE
IN EARTH AS IT IS IN HEAVEN.
GIVE US THIS DAY
OUR DAILY BREAD
AND FORGIVE US OUR
TRESPASSES
AS WE FORGIVE THEM

PIECE 5. CUT IN TWO HALVES.



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SIZE 1 9/16" X 1 1/2"



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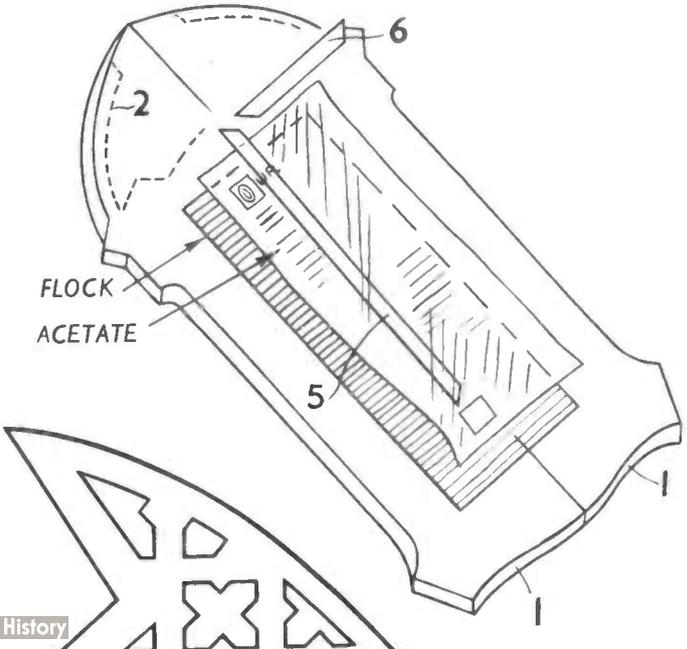
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Y BREAD
IS OUR
ES**

ACETATE CUT TO THIS LINE

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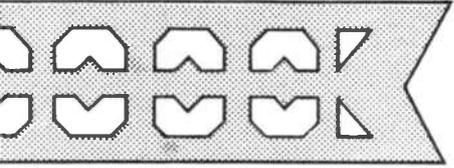
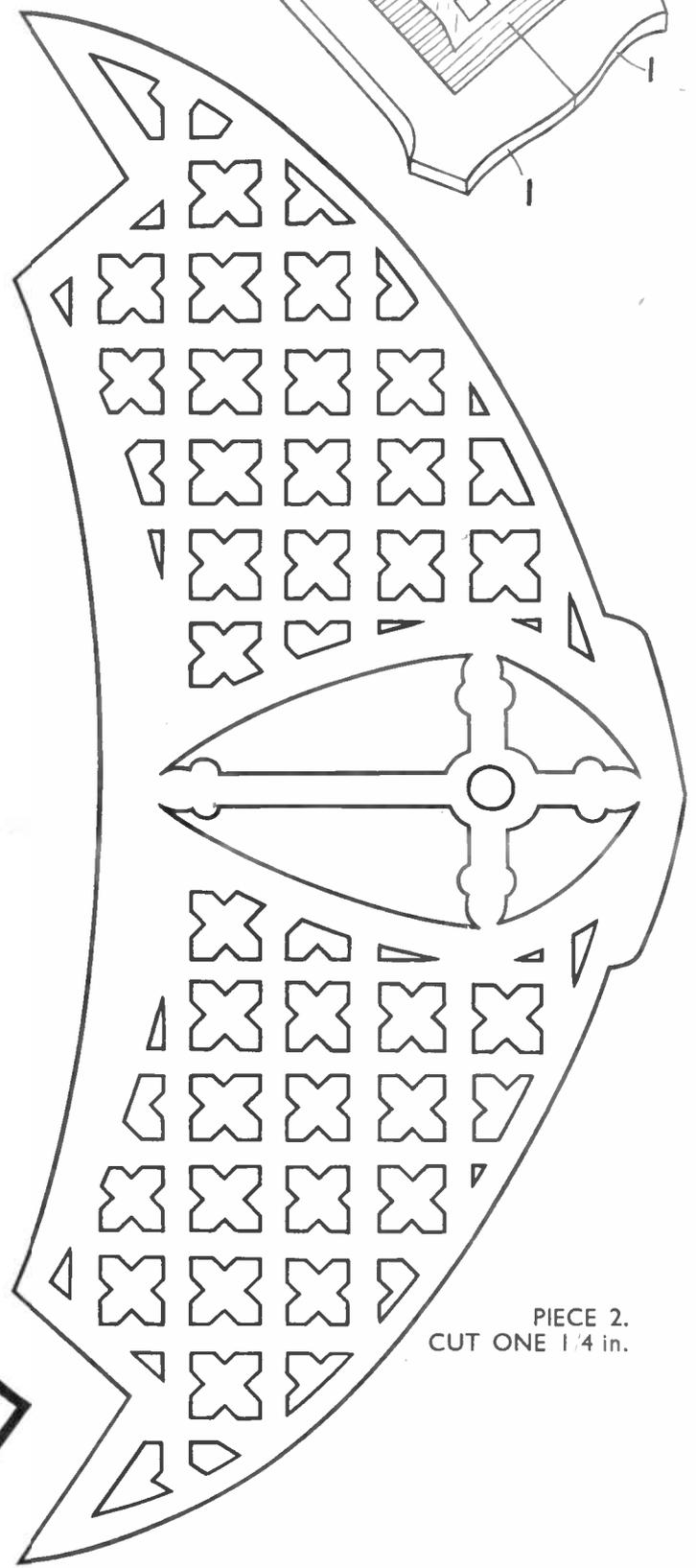
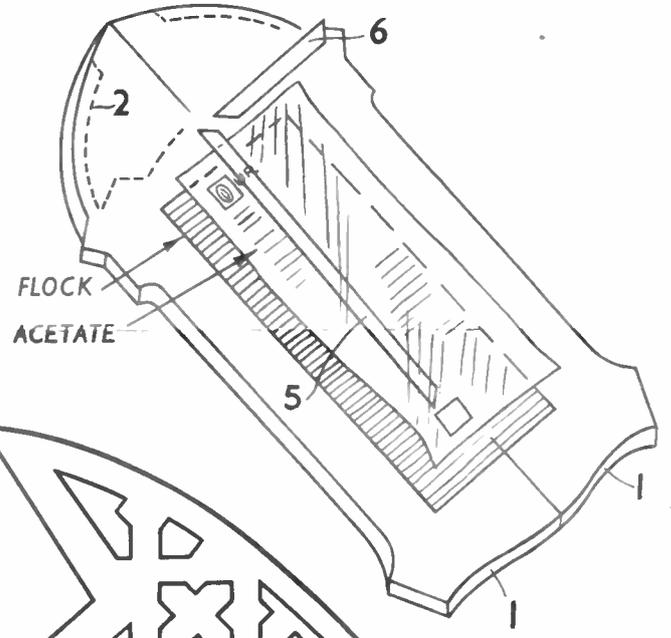
... HEAVEN...
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 ... KINGDOM
 ... E GLORY
 ... D EVER
 ... N

PIECE 5. CUT ONE 1/4 in.

o PIN

PIECE 3. SHADED. CUT ONE 1/4 in. GLUE ON IN POSITION SHOWN.

PIECE 2. CUT ONE 1/4 in.



GLUE ON IN

PRINTED IN ENGLAND.

PIECE 1. CUT ONE 1/4 in. TO OUTLINE ONLY. CUT IN TWO HALVES.

PIECE 3. SHADED. CUT ONE 1/4 in. GLUE ON IN POSITION SHOWN.

PIECE 5. CUT ONE 1/4 in.

PIECE 6. CUT ONE 1/4 in.

PIECE 4. SHADED. CUT ONE 1/4 in. GLUE ON IN POSITION SHOWN.

...IT WILL BE DONE
 IN EARTH AS IT IS IN HEAVEN.
GIVE US THIS DAY
 ♦ **OUR DAILY BREAD**
AND FORGIVE US OUR
TRESPASSES
AS WE FORGIVE THEM
AND **THAT TRESPASS AGAINST**
LEAD US NOT INTO
TEMPTATION
BUT DELIVER US FROM EVIL
FOR THINE IS THE KINGDOM
THE POWER AND THE GLORY
FOR EVER AND EVER
 ♦ **AMEN** ♦