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NUMBER 3364

THE ORIGINAL
'DO-IT-YOURSELF'
MAGAZINE

HOBBIES *weekly*

FOR ALL
HOME CRAFTSMEN

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A FOLDING
PICNIC CHAIR

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FOR JUNE

COLLECTORS' CLUB

DESIGNS FOR
TABLE MATS

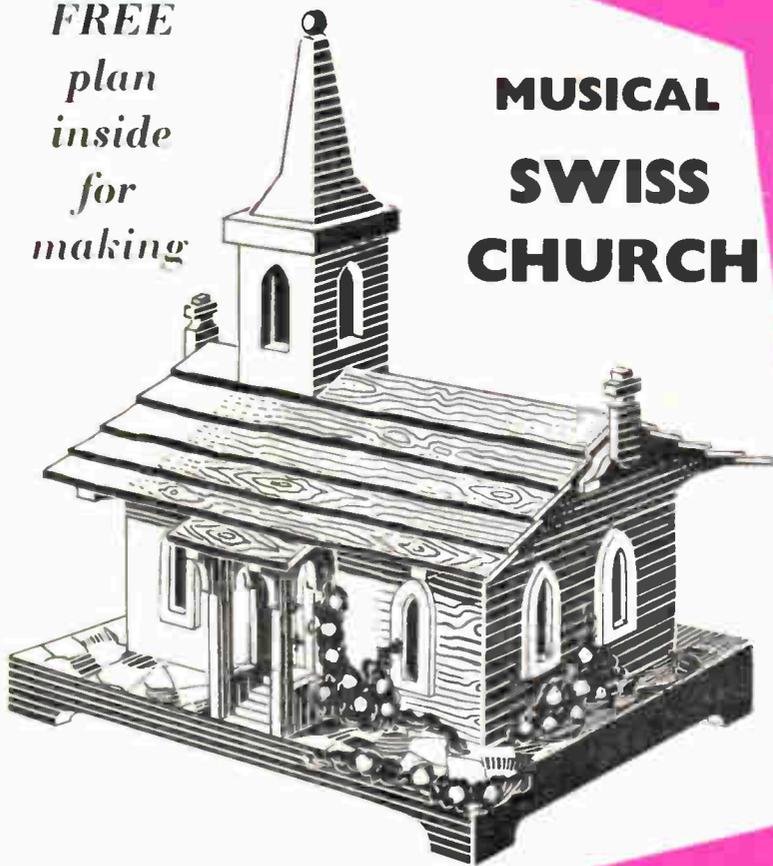
MODEL DIESEL
ELECTRIC LOCO

PHOTOGRAPHY

ETC. ETC

FREE
plan
inside
for
making

**MUSICAL
SWISS
CHURCH**



Up-to-the-minute ideas

Practical designs

Pleasing and profitable things to make

5^D



THE chief furs employed in the blazonry of the escutcheon, a shield on which the heraldic arms of a family are emblazoned, are ermine, vair, and miniver. Vair is made in heraldry to represent bells or cups — white and black, upright or upside down, ranged alternately or in horizontal lines.

The origin of the introduction of vair into armory is ascribed to the Signior de Coucics. When engaged in battle in Hungary, perceiving that his army was in the act of flight, he tore out the lining of his cloak, which was the skin of the varus — a small animal of the weasel kind — and displayed it as an ensign for the purpose of rallying the men. It had the desired effect, and resulted in victory, and from thenceforth that fur became the armorial ensign of his signiory.

Some people believe that the wonderful slippers of Cinderella were made of vair, fur — not verre, glass!

Miniver is the skin of a small animal found in Lithuania, called the Lituite, and is of a pure white.

As some escutcheons have more than one tincture, they are necessarily divided by lines. In addition to these lines and the charges (or devices) emblazoned upon the escutcheons, there are certain bands, etc., which are called *honourable ordinaries*. These were marks of distinction originally bestowed by the sovereign for eminent services, either in council or in the field of battle, chieftains alone being entitled to them; and over and above these marks of the highest distinction there are also *subordinate ordinaries*.

Of the former category, these are the Chief, a broad band terminated by a horizontal line, occupying one-third of the upper part of the field. The chief has a diminutive, called the fillet.

The Pale is a band consisting of two perpendicular lines from the top to the base of the field, occupying one-third

of its width.

The Bend, which is formed by two diagonal lines, drawn from the dexter chief to the sinister base, occupying one-fifth of the field if uncharged, but if charged, one-third only. This bend has four diminutives — the garter, the cotice, the riband, and the bendlet.

HERALDRY—3

The Bend Sinister, which is of the same width as the bend dexter, has a diminutive called the scrape, which is but half its size.

The Fess, a broad horizontal band across the centre of the field, occupying one-third of its breadth.

The Bar, a horizontal band occupying a fifth of the field, and of which there may be two. It has two or three diminutives, i.e. the closet, the barrulet, and the gemels. When the escutcheon contains a number of bars — of colour and metal alternately — and exceeding five, the honourable ordinary is called a Barry of so many pieces.

The Chevron is in form like the gable end of a roof, and is represented on the coat-sleeve of a military non-commissioned officer. It has two diminutives — the chevronelle and the couple-close.

The Cross, the distinguishing badge of the Crusaders, occupies one-fifth of the field when not charged, otherwise one-third, the two islands simply crossing each other at right angles in the centre of the field. There are many varieties used in heraldry, described as a cross engrailed or a cross invected, etc, the simple form remaining unchanged.

The Saltire, in which the bend and bend sinister cross each other diagonally on the field, like that of St. Andrew.

II. A Genealogical Achievement; so quartered as to leave spaces for the

blazoning of ancestral arms, which the bearer may have a legal right to combine with his own; with all the exterior ornaments of the Shield, Crest, Helmet, Mantle, Motto, and Scrolls.

The Subordinate Ordinaries are — The Gyron, the Canton, Lozenge, Fusil, Masele, Fret, Pile, Inescutcheon, Orle, Flanche, Flasque, Voider, and Tressure.

The mark of special distinction called the canton, a square marked out on the dexter chief of the field, and sometimes charged (when it may be enlarged), represents the banner of the ancient knights banneret. The exact period of the first institution of this distinction is uncertain; but it can be traced from the time of Edward I.

The ordinary Knights carried a pennon. When raised to the dignity of a banneret, the King (or general) caused the point of the pennon to be rent off, and the square portion left was thenceforth suspended as a small banner upon his lance. The last Knight banneret made in England was Sir John Smith, after the battle of Edgehill, for rescuing the standard of Charles I from the rebels.

The charges borne on coats of arms signify devices. These often bore some reference to deeds of arms, for the lands were held under the Crown by military tenure, and coats of arms had no connection with any but armed service to the state.

Although the subject of coats of arms is too wide for the limits of these brief articles, a few words may be given with reference to special charges, and a list of the roundels and guttae, and which form a distinct group of charges. The latter consist of small circular figures, seven in number, and distinguished one from another by their several tinctures. They are named thus:

1. The Bezan — Or.
2. The Plate — Argent.
3. The Torteau — Gules.
4. The Heurte — Azure.
5. The Pellet or Agress — Sable.
6. The Pomme — Vert.
7. The Fountain — Barry wavy of six, Argent and Azure.

These are of frequent occurrence in heraldry.

With reference to special charges, the several forms of the cross, also the scallop-shell, the crescent, and the lion, are specially indicative of the Crusaders and pilgrimages made to the Holy Land,



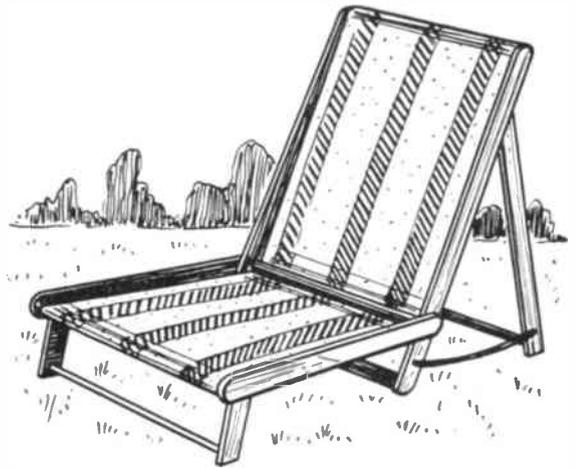
A PICNIC CHAIR

TO FOLD INTO THE CAR BOOT

A GREAT many of the metal picnic chairs on the market have very highly stressed joints which gradually weaken with use and finally 'give up the ghost'. Here is a design for a wooden picnic chair which may be built as strongly as you like, according to requirements.

The frame is well jointed and all joints are glued, but the method of construction is such that no cramps are needed, and even the joints can be cut with a fretsaw. First decide upon the size of the chair (or chairs) and draw a rough sketch with the measurements marked upon it. The sizes given in the drawing may be used as a guide; they are suitable for a medium-sized person. Width depends upon the size of deck chair canvas you buy. If you wish to make a large chair, do not hesitate to use a heavier section of timber than that shown, which for all rectangular parts is $1\frac{1}{2}$ in. by $\frac{3}{4}$ in.

By *R. N. T. Burke*



Use a knot-free, straight grained timber; it will save trouble if you buy it ready planed. Cut all the pieces to length and write on each piece what it is, otherwise confusion is possible. Take the pieces for the back, and mark and cut the joints. As previously mentioned, these can be cut with a fretsaw as easily as any other way. Coat the joints with a good waterproof glue, assemble the frame, and then drive a panel pin through each joint to secure it whilst drying. The back support, the seat, and

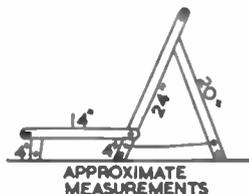
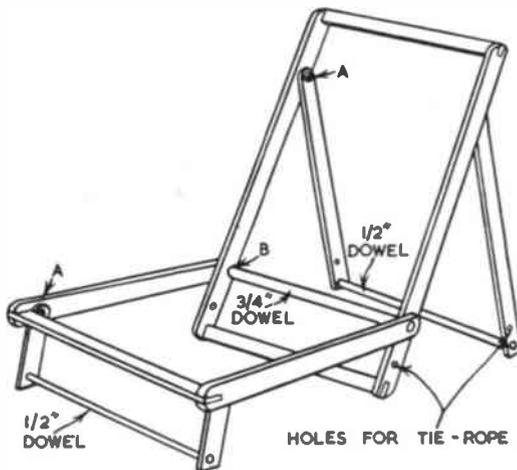
the front legs are then built up in the same way, with glue and pins at each joint.

The swivels at A are round-headed screws with a washer to protect the face of the timber. The seat is fastened to the back by passing the $\frac{3}{4}$ in. dowel through the holes drilled for this purpose. The dowel is glued and pinned to the seat side-members, leaving the back freely swivelling (B).

Drill the holes for the tie rope and sand off all sharp corners, especially those round which the canvas is stretched. Painting is neither necessary nor desirable, but linseed oil rubbed well into the wood is a good idea.

To cover, double the end of the deck chair canvas and fasten it firmly to the back of the top rail of the backrest, using upholstery tacks. Pass the canvas over the top, under the seat pivot dowel, and round the end rail of the seat, where it is secured as at the other end. Make sure that the canvas is kept as tight as possible, for it will sag a little with use.

The seat is adjustable by moving the knots of the tie rope, and as the backrest assembly becomes more widely spread, so the rear end of the seat gets lower, giving a good reclining position for relaxation.



Next week's issue will contain plans for making the 'Hydro-Swift', a jet driven hydroplane in balsa wood. Also a 2-transistor receiver and other popular features. Make sure of your copy.

Illustrated on front

MAKING THE SWISS CHURCH

THE keen modeller will appreciate this charming design for a Swiss church, which can be used as a container for cigarettes or trinkets, etc. It has a musical movement which is operated by the lifting and closing of the church roof, and there is a wide selection of tunes from which to choose, a particularly appropriate one being the Swiss Bell Chimes.

Standing 7 in. high and 5½ in. long, the church can quite easily be made up by even the average worker with but a few simple tools, and it makes an excellent choice as a gift. The addition of

¼ in. wood used for roof pieces 17 and 18 in order to prevent splitting when cutting.

The first stage in assembly is to make the base, as shown in Fig. 1. Pieces 8 and 9 are mitred round, and glued on the inside of piece 1.

Continue by building up the main body of the church on to the base by gluing the ends (4) in between the front (2) and back (3). Fig. 2 shows this assembly, from which the front has been omitted in order to clarify the positioning of the musical movement, which is screwed on the base with the winder

A KIT FOR 10/6

Hobbies Kit No. 3364 contains all the necessary wood and materials for making this delightful Swiss Church. Kits from branches etc. price 10/6, or from Hobbies Ltd Dereham, Norfolk (post 1/6 extra)

A full list of tunes suitable for incorporation are available on application. Musical movements cost 14/11 (post 6d extra)

Fig. 1

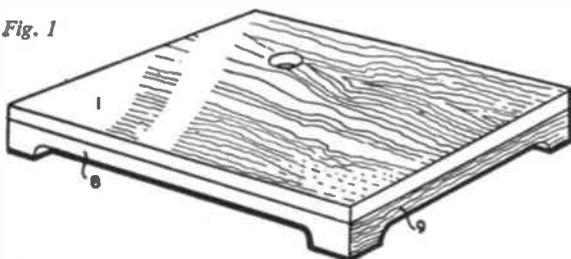


Fig. 2

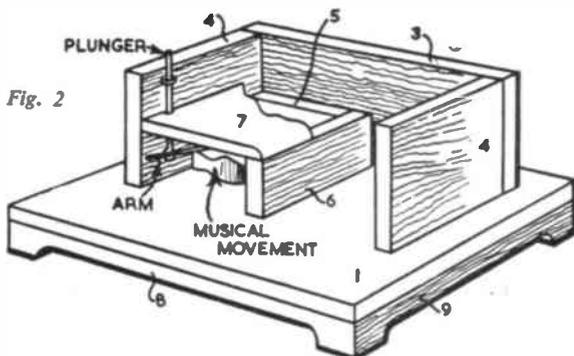


Fig. 4

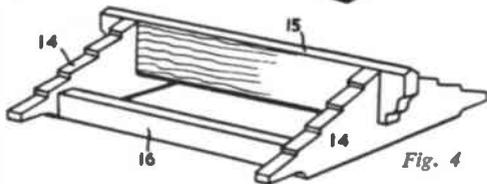


Fig. 5

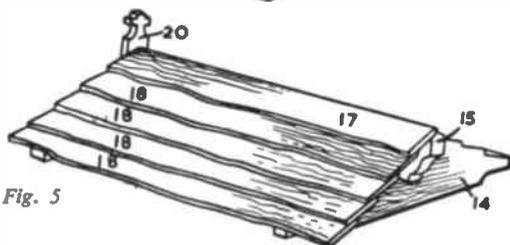
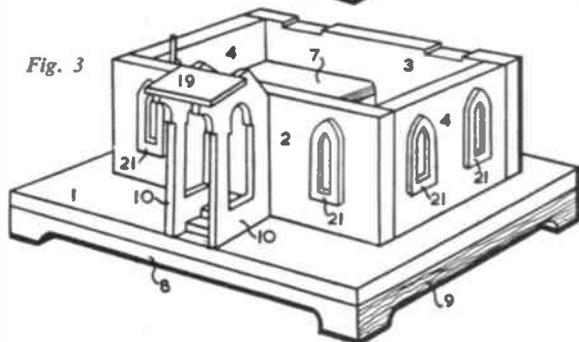


Fig. 3



colourful flowers and shrubs, mock paving, etc, makes an attractive feature and will be described later on.

All the parts are shown full size on the design sheet. These should be neatly traced and their shapes transferred to the various thicknesses of wood by means of carbon paper. After cutting out with the fretsaw, clean up all the pieces thoroughly, preparatory to assembly. Take care to keep to the outlines in cutting, and ensure good fitting parts by the use of glasspaper. Incidentally, it will be found beneficial to stick Sellotape over the ends of the

shaft through the keyhole.

The compartment for the movement consists of pieces 5 and 6 glued in position, as shown. The plunger for the movement is fashioned from wire with an eye at the end, and the length of the plunger should be left fully long, so that it can be adjusted for easy action of the musical box when the roof has been added. The eye of the plunger is slipped over the arm of the movement, and as shown in Fig. 2 it is held in an upright position by the notch in piece 7, which can now be screwed in place. Note that screws only are used for fixing piece 7, as

it may be necessary subsequently to remove this in order to make adjustments to the movement underneath. The plunger, which, of course, activates the movement, is further located by a small staple fashioned from a fretpin and inserted into the side.

The addition of the porch and steps is clearly illustrated in Fig. 3, which also shows the window overlays glued in position. Note also the recesses made in piece 3 to take the hinges for the later addition of the roof.

Pieces 14, 15 and 16 are glued to

● Continued on page 149

- JUST TO REMIND YOU - GARDENING HINTS



JUNE

THESE NOTES REFER CHIEFLY
TO MIDLAND GARDENS. DUE
ALLOWANCE SHOULD BE MADE
FOR CHANGE OF LATITUDE.

Outside

ALL danger of frost is now over and bedding plants can be put out without fear of damage. Plants should be well watered a few hours before lifting, and should be kept moist for a few days until well established.

Seeds of perennials and biennials such as lupin, delphinium, aquilegia, lychnis, hollyhocks, and aubrietia may be sown in a shady border. Water the drills before sowing and conserve moisture by covering with newspaper for a few days until germination takes place.

vigorous and healthy stock. Keep a good mulch on blackberries, loganberries, and raspberries. White and red currants should be summer pruned by cutting back young side shoots.

VEGETABLE GARDEN — Plant out celery. Keep well supplied with moisture, especially during dry spells. Plant out tomatoes, cucumbers, and gourds. Most brassicas may now be transplanted to final positions. Earth up potatoes and stake runner beans.

Continue to sow lettuce, radish, carrot, and turnips. Make a final sowing of peas, using a first early variety.

Inside — warm house

SHADE as necessary and provide humidity by watering floor and staging. Continue to feed plants approaching flowering time. Pot on where possible. Take cuttings of fuchsias, hydrangeas and begonias.

Cool house

CHRYSANTHEMUMS should know be outside. Cinerarias are

potted up to provide early flowering plants. Sow seeds of prim. malacoides and calceolarias. Feed tomatoes, cucumbers, and fuchsias regularly. Fumigate or spray at intervals of ten days to keep down green fly, white fly, and red spider.

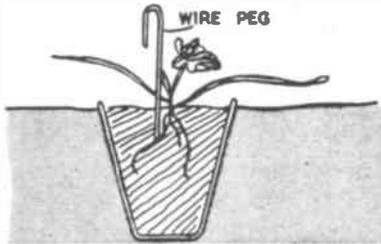
Increase water for cacti and succulents. Allow to dry out thoroughly before watering again. Small plants may still be transplanted.

Cold house

ATEND to pot plants. Feed, pot on, and fumigate. Feed tomatoes, cucumbers, and melons. Sow seeds of prim. malacoides. Shade tender plants and provide humidity for cucumbers and begonias.

General

CONTINUE to make compost. Make a start on preparing greenhouse for painting. Make good cracked panes. Keep the hoe going. Cut lawns twice a week. (M.h.)



Striking strawberry runners

Roses should be sprayed regularly against greenfly, black spot, and mildew. It is recommended to use a spray containing captan for black spot. Your seedsman will advise you which sprays to use. Hardy annuals should be thinned drastically, to give plenty of room for development.

Stake and give support to herbaceous and bedding plants where necessary. Large dahlias in particular need strong stakes to support them when fully grown. Remember that although most plants will stay upright during dry calm weather, rain and wind will quickly lay them flat.

ROCK GARDEN — Continue hand weeding. Put down bait for slugs and snails. Sow seeds of dianthus in variety. Increase existing plants by inserting cuttings in a box of sand placed in a cold frame. Aubretia and arabis may also be increased in this way.

FRUIT GARDEN — Give protection to fruit being attacked by birds. Continue to thin out gooseberries. Sink 3½ in. pots in strawberry bed preparatory to striking runners for next year's plants. Renew one row each year to keep a

● Continued from page 148

Making the Swiss Church

gether, as shown in Fig. 4 to form the main structure of the roof. Note the section of the top of piece 15 to conform with the slope of the roof pieces 17. These can now be added, together with pieces 18 on each side of the roof, as shown in Fig. 5. The finials (pieces 20) are also added at this stage to the ridge pieces (15).

Details for making the tower are fully illustrated on the design sheet showing how pieces 22 and 23 are capped by pieces 24, 25 and 26. Pieces 25 and 26 are, of course, previously shaped, as shown by the sections on the design sheet. The addition of a small No. 80 knob completes the spire, and the tower section can now be glued in place towards one end of the roof, as indicated in the illustration of the finished church. Recesses should also be cut in the back piece 16 and the roof hinged in place.

Test the action of the raising and

lowering of the roof, and its effect on the plunger in starting and stopping the musical movement, and adjust the length of the plunger accordingly.

On the finish will depend to a great extent the attractiveness of the Swiss church. Trees and shrubs cut from waste wood and modelled by the addition of plastic wood, can be added to the base. Climbing plants by the porch and windows are fashioned from plastic wood squeezed direct in position from the tube. Before the plastic wood dries, it can be shaped with a sharp-pointed piece of wood.

In all cases, the woodwork should be well rubbed down with fine glasspaper to give as smooth a finish as possible. A paving stone effect can be represented on the base and the roof should be left in its natural wood colour varnished over. Choice of other colours is according to individual taste.

THE WILD LIFE AROUND US

ONCE the summer comes with its light evenings one has the time and opportunity to observe some of the wild life that surrounds us. And, of course, when holidaying in the country or at the seaside, the opportunities for nature study are limitless. Although the mammals are the largest creatures found in this country, they are probably the least often seen due to their shyness, and the excellent way many of them fade into the background.

Mammals found in this country may be divided into insectivores, rodents, herbivores, and carnivores. This classification is based on the animals' tooth structure, and does not necessarily mean that a carnivore never eats vegetable matter.

By P. R. Chapman

The insectivores are the smallest of the British mammals, the pygmy shrew being the smallest of any mammal. In this country the insectivores are represented by bats, shrews, moles, and hedgehogs. Of these, only the bat is purely insectivorous, the other animals supplement their diet with worms, slugs, and other similar creatures.

Everyone is familiar with the spiny hedgehog. Although mainly nocturnal, it may sometimes be seen strolling around in the daytime, and needs no further description. Moles are not likely to be seen on the surface, although their



Portrait of a Grey Squirrel



A friendly Red Deer stag.

characteristic small mounds may show that they have been at work under your lawn.

The shrew that you are most likely to see is the Common Shrew. This little animal may be found in the hedgerow; his body is about 3 in. long with a long hairy tail. This latter feature, may be used to distinguish shrews from rats and mice, who have naked tails. Another characteristic feature of the shrew is the very long snout extending in front of the mouth. In colour the shrew is dark on top, paling to greyish colour underneath.

The bats most frequently seen are the Pipistrelle, and the Noctule. All bats are nocturnal, but the actual time of flight depends upon the availability of their insect food. The Pipistrelle or Common Bat is often to be seen flying around our cities at dusk in summer. It utters high pitched little squeaks whilst flying. While the Pipistrelle has a low fluttering flight, the Noctule is high flying. They are often seen in company with Swifts, and have the same graceful gliding flight. The method of flight may be used to distinguish these two bats.

The rodents include such commonplace animals as the rat, the house mouse, rabbit, and a host of interesting animals. Superficially the hare resembles the rabbit, but whilst rabbits are found in groups, the hare is a solitary animal. The body and hind legs are

longer than those of his cousin. The hare also has distinguishing black tips to his ears, which the rabbit does not have. Hares do not form burrows, but live an open air life.

Perhaps the most charming rodents are the squirrels. The Red Squirrel has a



A dog Fox

very limited range at the present time. It was formerly much more common, but is being replaced by the Grey, although it is common on the Continent. The Grey Squirrel, an American import, is much more numerous; in addition to its different colouring, the Red Squirrel may be distinguished by means of its large ear tufts.

The Field Vole is found in pastures, and even gardens. It may be known from any variety of mouse by its rounded head, inconspicuous ears, and short tail. The fur is reddish brown.

The smallest rodent is the charming

little Harvest Mouse. The fur on the upper part of the body is reddish, and that of the underside is white; the total length of the body about 2½ in., plus a long pliant prehensile tail. If you are lucky you may even find the circular nest suspended above the ground, often on several stalks of grass.

This country is not very well off for herbivores. There are the Red Deer, the Fallow Deer, and the Roe Deer. In its native state the Red Deer is only found in the wilder parts of Scotland, and the North of England. But it may, of course, be seen in parks where it has been introduced. It is the largest of the British deer, a stag standing about 4 ft. at the shoulders, and having a fine head of antlers during the breeding season. The summer coat is reddish brown. The Fallow Deer may be distinguished from the Red Deer by its smaller size, flattened antlers, and spotted coat. It

stands about 3 ft. at the shoulders; the Roe Deer is even smaller, being only about 2 ft. Its summer coat is reddish brown, and it has a characteristic white chin. The antlers are smaller than those of the other two species.

The largest British carnivore is the Badger, but he is not too frequently seen, owing to his nocturnal habit. He is easily recognized by his thickset body and his black face, with a white stripe down the centre. Badgers live in 'setts' underground, and are very clean animals, changing their bedding frequently.

Foxes are fairly common, and have a very characteristic smell, which gives a good indication when a fox is in the neighbourhood. They are more diurnal (daytime activity) than the badger, and in appearance they look like small brown dogs with fine bushy tails.

The stoats and weasels are the smallest but most blood-thirsty of our carnivores.

The Stoat is the larger of the two, and has a very characteristic black tip to its tail. It is about 14 in. long, excluding tail; its fur in summer is reddish brown. Stoats are found alongside streams and in the hedgerows. Like the Stoat, the Weasel is active by day, but it is only about 9 in. long, and its tail has no black tip. It is a short-legged smaller-headed beast, and has almost a snake-like appearance. Both these carnivores are vicious and strong; stoats readily attack the much larger rabbit, whilst weasels prey mostly upon rats, mice, and young birds.

I have mentioned only a few of the many animals that can be found in the countryside. Once you have learnt to recognize a few animals, you may soon increase your knowledge by means of the many excellent Natural History books that are on the market.

Interesting Locos—No. 24

BUILT FOR THE MIDLAND LINE

OUR illustration shows engine No. 1000, the first of the 4-4-0, 3-cylinder compounds designed by Richard M. Deeley for the Midland Railway in 1905. This engine was later re-numbered as 1005, and, as originally built at Derby, carried the following leading features: cylinders, one high-pressure 19 in diameter by 26 in. stroke, two low-pressure 21 in. diameter by 26 in. stroke; wheels, diameter, bogie 3 ft. 6½ in., coupled 7 ft.; heating surface, fire-box, 153 sq. ft., tubes 1,320 sq. ft., total 1,473 sq. ft., grate area 28.4 sq. ft. Wheelbase, engine total 24 ft. 3 in.; weight in working order, 59 tons 18 cwt;

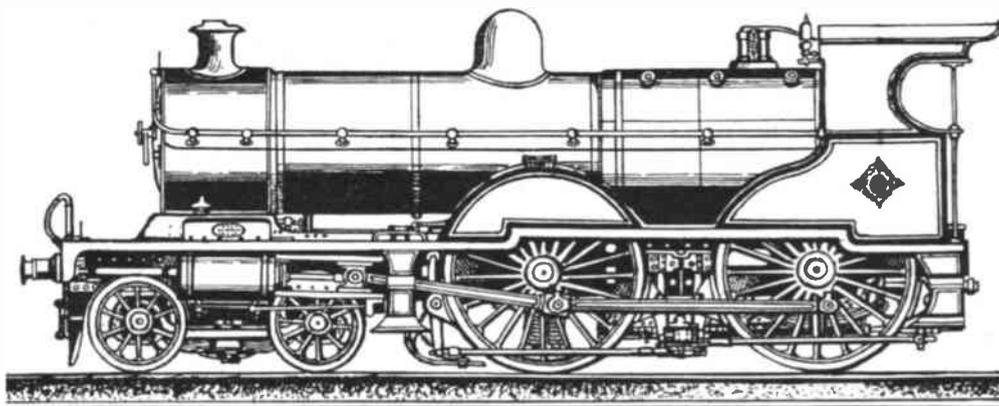
weight available for adhesion 39 tons 2 cwt.

The tender ran on six wheels, 4 ft. 3 in. diameter and carried 3,500 gallons of water and 7 tons of coal, weighing, loaded, 45 tons 18 cwt. 2 qrs. The total weight of engine and tender amounted to 105 tons 16 cwt. 2 qrs. in working order.

The original Deeley engines were numbered 1000-1044 and built in 1905-6. In 1924, Sir Henry Fowler adopted this type as the standard 4-4-0 express engine for the London Midland and Scottish Railway. These L.M.S. engines, which carried several modifications over the earlier engines, including super-

heaters and 6 ft. 9 in. diameter driving wheels, and modified tenders. They were used on express duties on all divisions of the L.M. & S.R. for a long period, including the London-Birmingham 2 hour expresses.

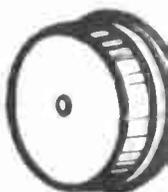
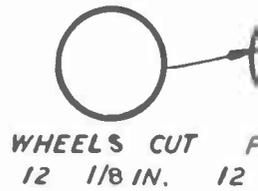
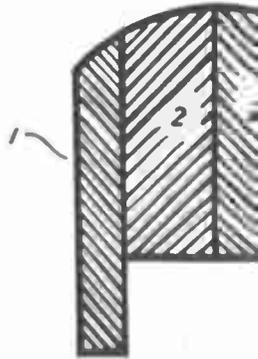
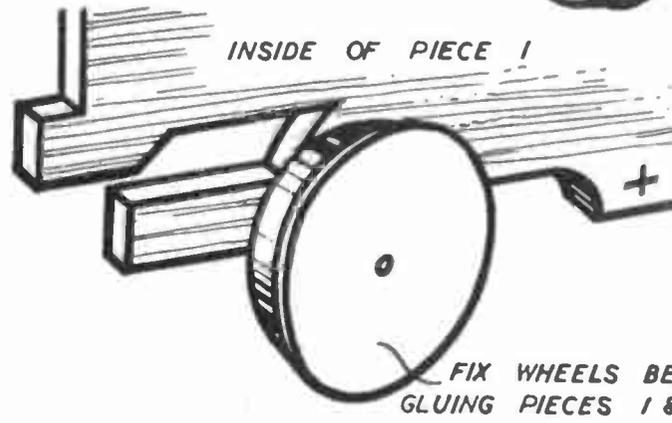
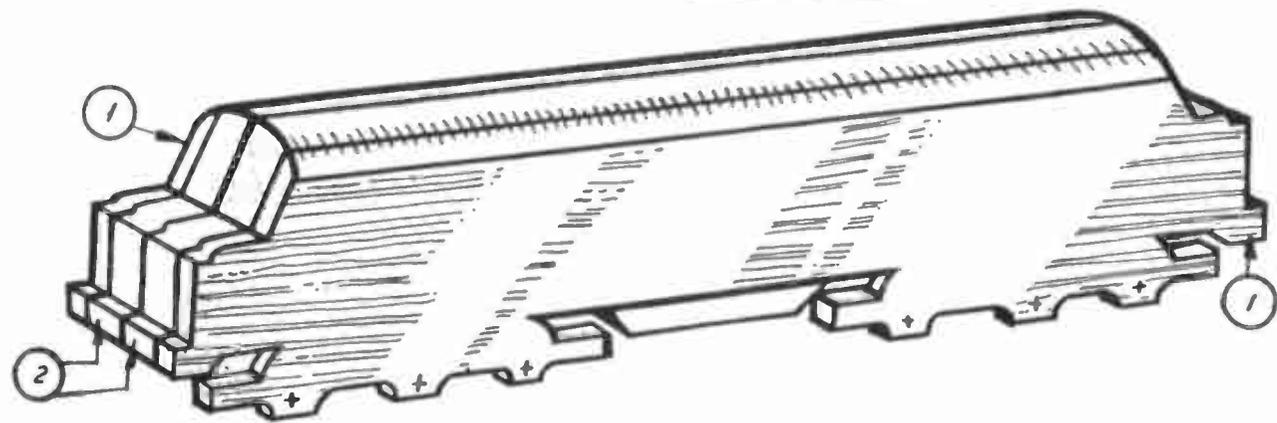
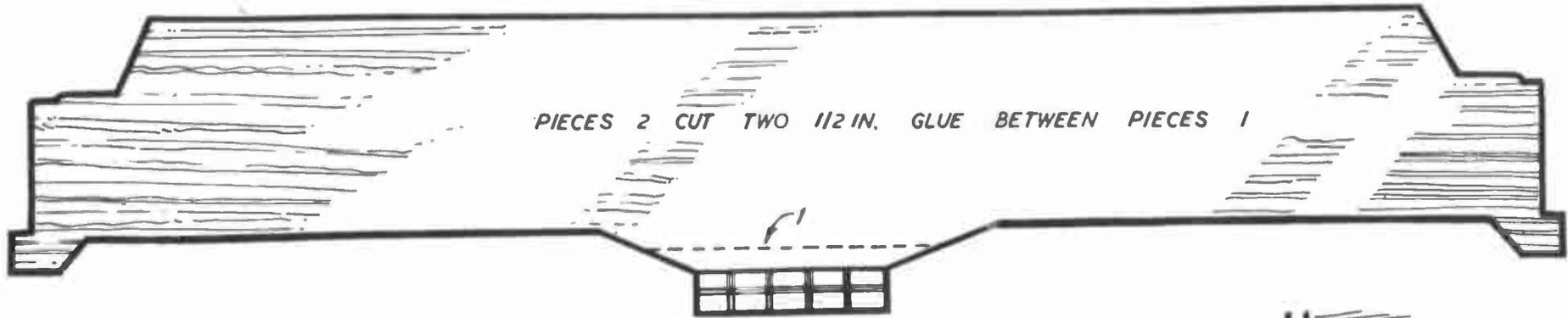
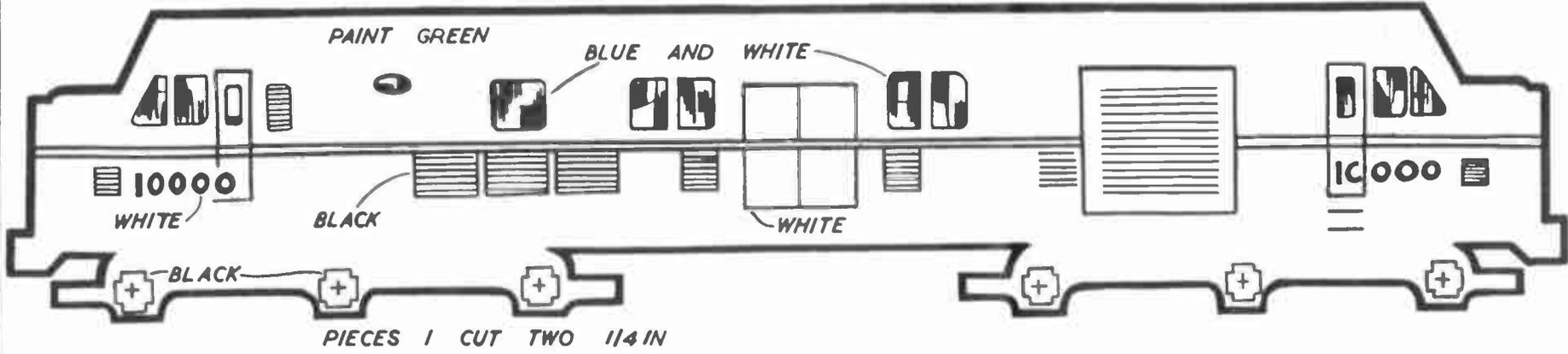
It should be noted that the first M.R. compounds, built in 1901 by Mr. S. W. Johnson, (3-cylinder, Smith System) and numbered 2631-2635 inclusive, were later re-numbered 1000-1004 in the same order, after being rebuilt to conform with the Deeley design. The L.M.S. Fowler engines built in 1924-7 were numbered 1045-1199 and 900-939 inclusive.



Midland Railway. 4-4-0, three-cylinder Compound Express Locomotive

MODES OF TRANSPORT =

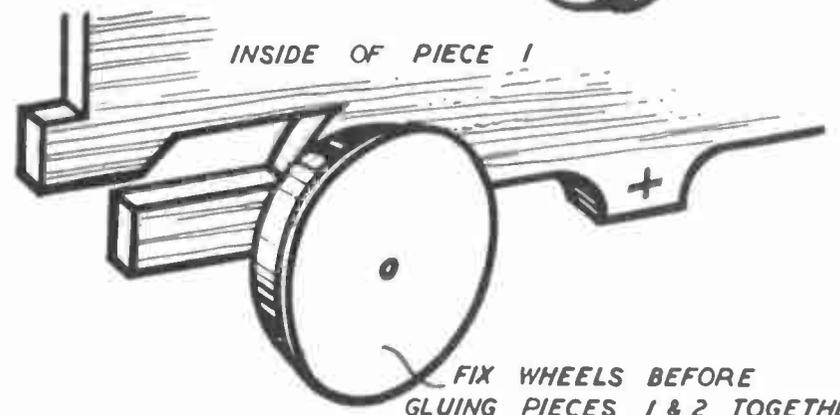
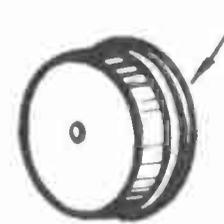
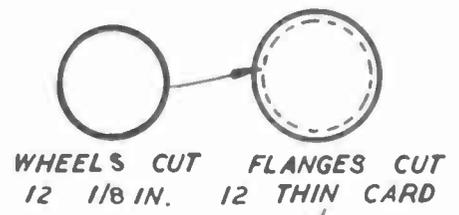
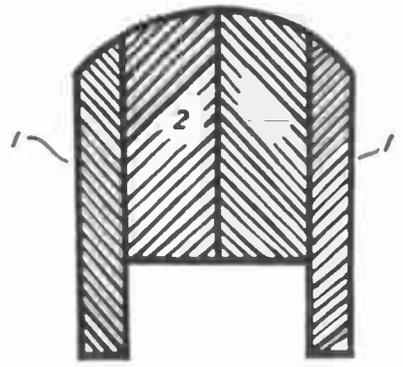
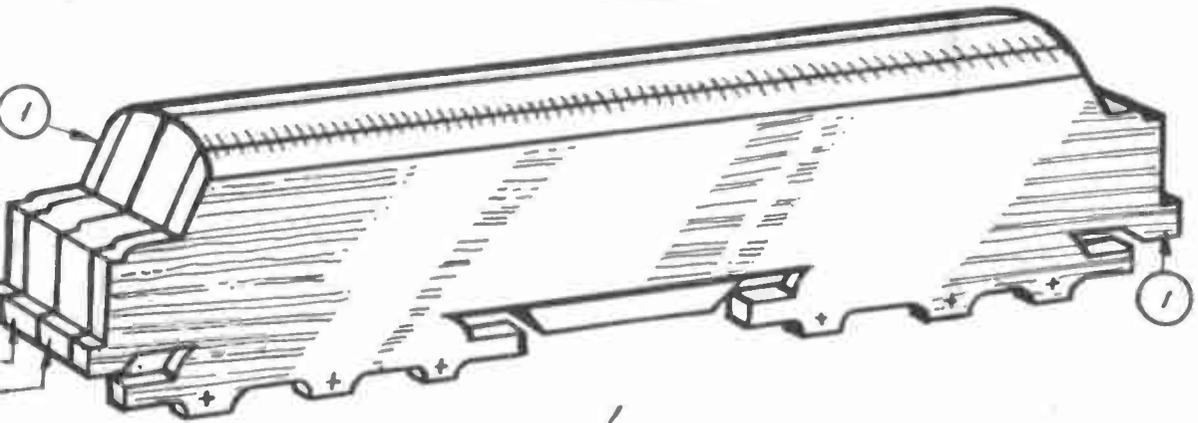
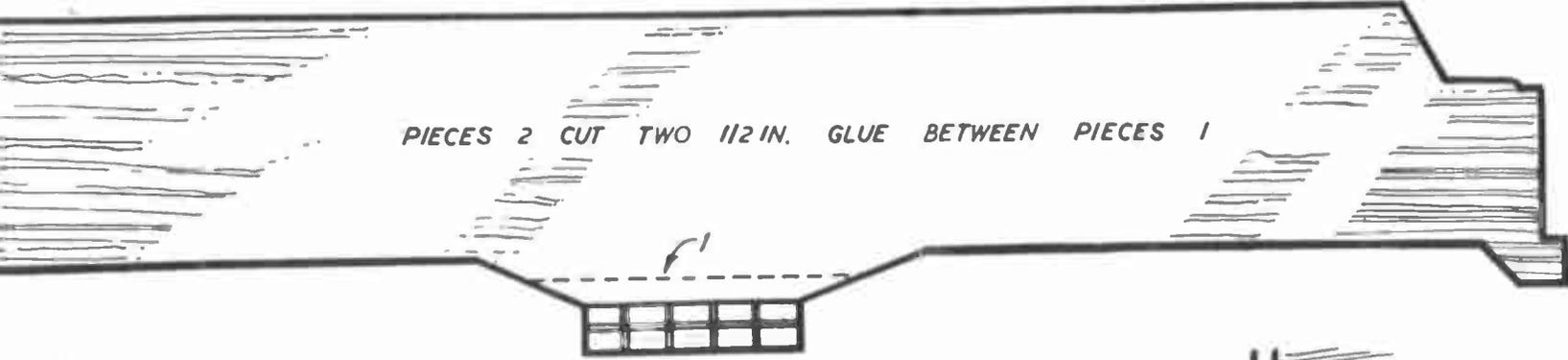
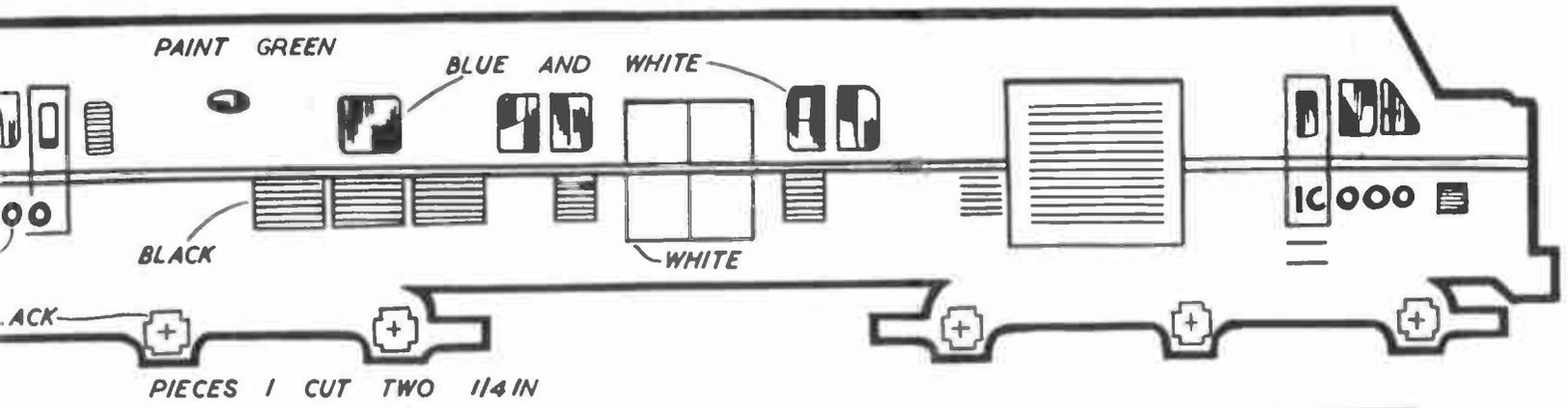
DIESEL ELECTRIC LOCOMOTIVE



PRINTED IN ENGLAND

ES OF TRANSPORT =

* DIESEL ELECTRIC LOCOMOTIVE



FIX WHEELS BEFORE GLUING PIECES 1 & 2 TOGETHER

Finding out about Lightning

THE most terrifying and dramatic display of electrical discharges in Nature is a violent thunderstorm. In the 18th century Benjamin Franklin performed a dangerous experiment which proved that lightning was really an enormous spark of electricity. With his son's help Franklin flew a kite, upon a hempen string, beneath a threatening storm cloud. The string was tied to a piece of silk which the great scientist held in his hand. Where the string and silk were joined together an iron key was tied. At first nothing happened, then Franklin noticed that some of the hemp fibres were standing up and actively repelling each other. Excitedly he placed a knuckle near the key and was delighted to see an electric spark leap from the key, to pass through his body to earth. Other scientists have remarked that the most surprising part of the experiment was that Franklin was not killed.

Making an Electroscope

The fact that the damp string had conducted electricity down from the clouds gave Franklin the idea for his important invention, the lightning conductor. With the aid of a home-made metal leaf electroscope you can demonstrate how a lightning conductor works.

Obtain a clean dry pickle jar and bore a hole to take a rubber stopper. The rubber stopper should have a hole through the middle. Press the stopper into the hole in the lid and fix a 4 in. nail through the rubber and secure it firmly into place, using sealing wax. Cut out two 2 in. by $\frac{1}{2}$ in. strips of aluminium foil and suspend these, face to face, from the point of the nail, by means of a short piece of thin copper wire. It may be an advantage to paint the outside of the jar with shellac varnish. The important point to bear in mind when making your electroscope is that the nail and foil strips must be thoroughly insulated from the metal lid.

Run a plastic comb through your hair and hold it near the head of the nail. If your electroscope is quite dry the static charge on the comb will spark across to the nail and cause both the foil strips to become negatively charged with electricity and to repel one another. Remove the comb and observe that the foil strips remain apart. When you touch the nail with a finger the electrons on the strips are discharged, through you, to earth, and the strips close together again.

When you are satisfied that your electroscope is working, attach a stout vertical copper wire to the nail by twisting the end of the wire. This will form your model lightning conductor. Now you

will need something to represent a cloud charged with electricity. Charge up an inflated rubber balloon by rubbing it upon a dry woollen garment.

Notice what happens when you move the charged balloon 'cloud' near the top of the 'lightning conductor'. The strong negative charge of electrons upon the balloon crackles across to the point of the tall copper wire and is conducted downwards to the foil strips. The strips

The tallest lightning conductor in the world is on the Empire State Building in New York, and, since it attracts lightning over a large area, it protects many of the smaller buildings which cluster around it.

Clouds become charged with static electricity by friction between the various particles in them as they rise and expand. Different parts of a cloud will have large negative or positive charges. Lightning may strike up or down. A negative charge of electrons will strike down to earth. When a cloud has a heavy positive charge, electrons will strike upwards, to neutralize the charge on the cloud.

By A. E. Ward

Safety precautions

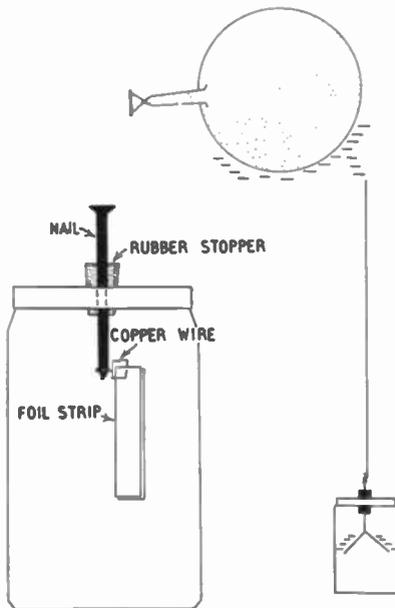
Highland sheep have often been killed by lightning striking upwards, through their bodies, to a positively charged cloud passing overhead. Lightning is most likely to strike tall objects, particularly if they are good conductors of electricity and terminate in sharp points. So far, forked lightning only has been described. The familiar sheet lightning is caused by multiple discharges of lightning from one cloud to another and may be silent. In tropical countries magnificent displays of soundless sheet lightning are common during monsoon times. Thunder is caused by forked lightning heating up the air, thus creating a great sound wave which echoes back and forth between the earth and clouds.

Of course you would not think of trying to repeat Franklin's kite experiment. Several men have since been killed doing it. Safety in thunderstorms is a matter of common sense. Never shelter under a single tree, since the high branches offer the lightning several convenient paths to earth. If the tree under which a man is sheltering is struck, the spark will probably jump towards him from the trunk, because human beings are better conductors than wood. If caught out in open country it is best to avoid high ground, or to lie down somewhere. A large wood is a good place to shelter, for it is unlikely that the particular tree that you are standing underneath will be struck.

Some lightning sparks may be six miles long and millions of electron volts are needed to produce them. To discover how far away a thunderstorm is raging, count the number of seconds which elapse between the lightning flash and the moment when you hear the thunder. Divide by five and you will have the approximate distance, in miles.

both acquire a negative charge and, since like charges repel, they diverge and will remain parted until you discharge them with an extended finger.

In a real lightning conductor the foil strips are represented by a large copper plate which must be buried in damp earth. At the top of the conductor there is a cluster of spikes called a 'crows foot'.



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Tilting the Camera for effect



A medium yellow will darken the blues of the sky sufficiently to separate it from the subject, should it be light in tone, or to accentuate any white clouds which may be present in the sky itself. For a more dramatic effect an orange filter can

By C. Robinson

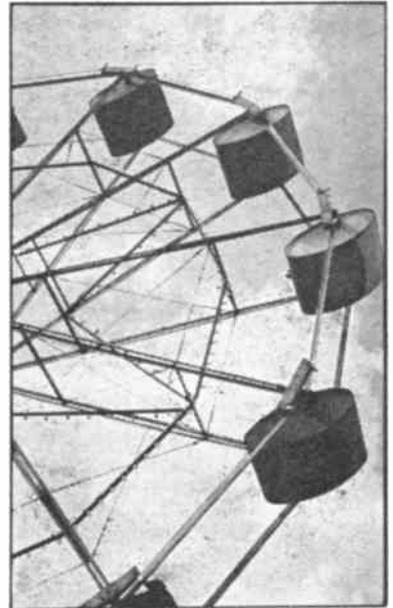
be used. Allowances must be made for these filters when calculating the exposure.

As with most pictures containing a large area of light tones, they can be helped considerably by the inclusion of a thin black border. This can be either drawn on the mount with indian ink, if the print is to be mounted, or made 'photographically' during printing, as described previously by myself in *Hobbies Weekly*.

Left: "Mersey Landmark"

Right: "The Big Wheel"

*Below: "Pattern in Concrete and Glass"
New Street, Birmingham.*



TILTING the camera is something which must be guarded against in the photography of buildings, street scenes, landscapes, etc, if we wish to have a true record of the scene before the camera. If we fail to ensure that the camera is held square to the subject, buildings will appear to be toppling over, verticals will converge, and horizons will be sloping.

Should our intentions, however, be to produce purely pictorial results, tilting the camera is one of the 'tricks' which can be used to give our pictures impact. There are a wide variety of subjects which lend themselves admirably to this treatment and, indeed, providing that the tilting is deliberate and drastically done, they are the better for it. Monuments, ships, modern buildings are among the subjects I would consider suitable to be photographed in this manner, but, of course, there are many others.

Good modelling and bold outlines are the essentials if such pictures are to be successful, which means that they must be taken when the lighting conditions are 'right'. Bright sunshine coming from one side of the subject is ideal, bringing out the texture and structure of the building, or whatever the subject may be.

As the majority of all such angle shots result in outlining the subject against the sky, careful thought must be given as to the best way of rendering this. This means using a filter on the camera lens.



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Replies to Readers

Finish for leather

I HAVE a leather case which has not been used for a long time, and has a fusty smell which I have been unable to obliterate. Can you advise me? (J.W.M.—Luton.)

YOUR trouble is due to damp air trapped in the case. This should be allowed to evaporate before any treatment. If you use any heat, let it only be moderate. Get some saddle soap from a leather shop or a saddler, and clean the leather with it. For the best finish and the right smell, use a polish intended for saddles, obtained from the same source.

Converting a Battery Set

I HAVE an old battery set which I would like to get operating again, possibly with domestic electricity as against the dry and wet battery system. Is this possible by the use of an eliminator? (A.R.—Salford.)

THE set can be run from A.C. mains with an eliminator. A ready-made one or kit of parts may be obtained from R.S.C. (Leeds) Ltd, 29-31 Moorfield Rd, Leeds 12. It is essential to use an eliminator giving the correct output, and not the type intended for all-dry portables. The lower voltage points can be obtained by adding dropper resistors, as most such eliminators deliver 120V. for this type of set. The low voltages for grid bias must be reasonably correct. This also applies to the filament voltage, or the valves may be damaged. But the exact H.T. voltage is much less important.

Increasing the volume

I AM the owner of a 'Dansette Junior' electric gramophone. The volume is not very strong, and I am wondering if this could be increased in any way. (R.S.—Wolverhampton.)

THERE is no easy method of increasing volume. The best way would be to use a larger amplifier, and possibly larger loudspeaker, in accordance with the volume wanted. It is not a very straightforward matter to add to the existing amplifier to get more volume. Gladstone Radio, 25 Wordsworth Rd, Worthing, Sussex, can supply a 6-watt amplifier with speaker.

Newsprint Transfers

I WILL be grateful if you will let me know if there is any medium on the market or alternatively any preparation which can be made up for the purpose of reprinting pictures, etc, from newspapers on to plain paper. (D.T.—W.11.)

THERE are several recipes for such newsprint transfer liquids. One consists of 1 part of candle wax dissolved in 2 parts of turpentine. A second — liquid soap 3 fluid ounces, potassium carbonate $\frac{1}{2}$ ounce, liquid detergent $\frac{1}{2}$ fluid ounce, water 1 $\frac{1}{2}$ pints. A third — Diglycol stearate 2 ounces, soda ash $\frac{1}{2}$ ounce, turpentine or naphtha 5 ounces, water 1 $\frac{1}{2}$ pints. Make up the second by dissolving all together. The third is made by dissolving the diglycol stearate in the warmed water, and then stirring in the other items until an emulsion is formed.

Repairs to Porcelain

THERE are some rather large chips in my kitchen sink, and I wonder if you have any suggestions as to how I can fill them in, obtaining a finish as near as possible to the original. These chips are slightly deeper than the porcelain finish. (B.S.—Marden.)

UNFORTUNATELY there is no method of applying a finish at home which is comparable in hardness and durability to the porcelain enamel finish applied in the manufacture of sinks and similar things. You can disguise the chips with bath enamel. Follow the maker's instructions. Grease must be removed. If you apply several coats it will be possible to build up near the original level. This treatment should last for many months, but you must be prepared to touch up occasionally.

Windscreen Washer Fluid

I SHOULD like to know the materials or ingredients used in making up the solution used in car windscreen washers. (D.C.—Enfield.)

A WINDSCREEN washer fluid can be made up by dissolving 0.6 gram of cooking salt in 60 c.c. of water; then add 100 c.c. of glycerine and shake until an even mixture is obtained. Stir in 1.25 c.c. of alcohol and 0.6 gram of flowers of sulphur.

Flash Powder Formula

COULD you please send me the formula for flash powder? (H.B.—Bilston.)

PHOTOGRAPHIC flash powder may be made from magnesium powder, one part by weight, and potassium chlorate powder, two parts by weight. Mix by rolling gently on a large sheet of paper until an even mixture results. They must NOT be mixed by grinding, since friction of this heavy type may cause explosion. The mixture is best made in small quantities as required.

Transistor Set Costs

COULD you please tell me the total cost of (a) the 2-transistor receiver in Hobbies Weekly Vol. 127, No. 3292 and (b) the 2-transistor receiver in Vol. 127, No. 3284. What would be the approximate size of (b), and would this set be alright for carrying around? (B.M.—Sutton Coldfield.)

THE loudspeaker set can be built on a panel 6 in. square or smaller, according to the spare space allowed and size of speaker. For speaker reception, a reasonably effective aerial and earth would be needed. For phone reception much less effective aerials and earths will do. Results also depend on local conditions. Building cost of either set would be in the neighbourhood of 25s. without phones, speaker or battery, but prices of parts vary somewhat, so that you can only read an exact price by obtaining the current lists of the component suppliers. One source of parts is Henry's (Radio) Ltd., 5 Harrow Road, Paddington, W.2. Price lists for pocket transistor sets may be obtained from them free.

Illuminated Bagatelle

I AM making a child's bagatelle game and wish to make it light up when the ball goes through the hole. Please can you send me any details? (B.D.—Bolton.)

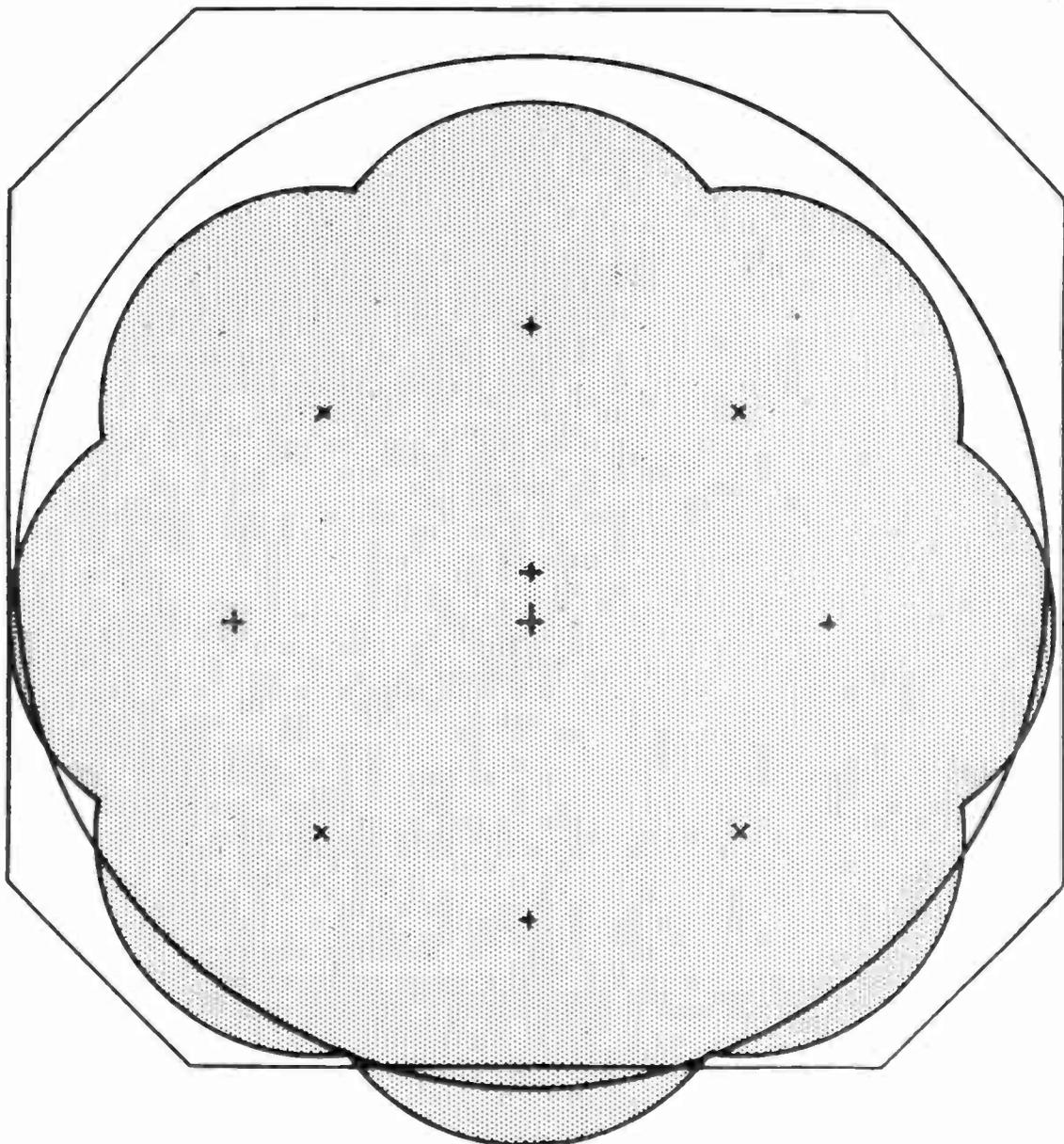
THE simplest method would be for a pair of metal contact strips to be fitted under each hole so that they are shorted when a metal ball occupies the hole. This would complete the circuit to a bulb, in each case illuminating a suitable score. If the numbers are to be added automatically, as in some such games, the balls should momentarily complete the circuit when falling through a hole. This completes an electro-magnet circuit, which moves an armature to which is attached a pawl, which turns a toothed wheel coupled to rotating contacts. The rotating contacts then switch in the various illuminated scores.

TABLE MATS

THREE DIFFERENT SHAPES TO CUT OUT WITH A FRETSAW

ANY of the three shapes shown here may be cut from $\frac{1}{4}$ in. hard-board or plywood and covered with plastic material. Transfer the shapes to the wood and cut them out with a fretsaw. Clean up with glasspaper before covering.

If using a Hobbies fretmachine it is possible to cut five or six pieces at once if they are pinned together through the waste wood. (M.p.)



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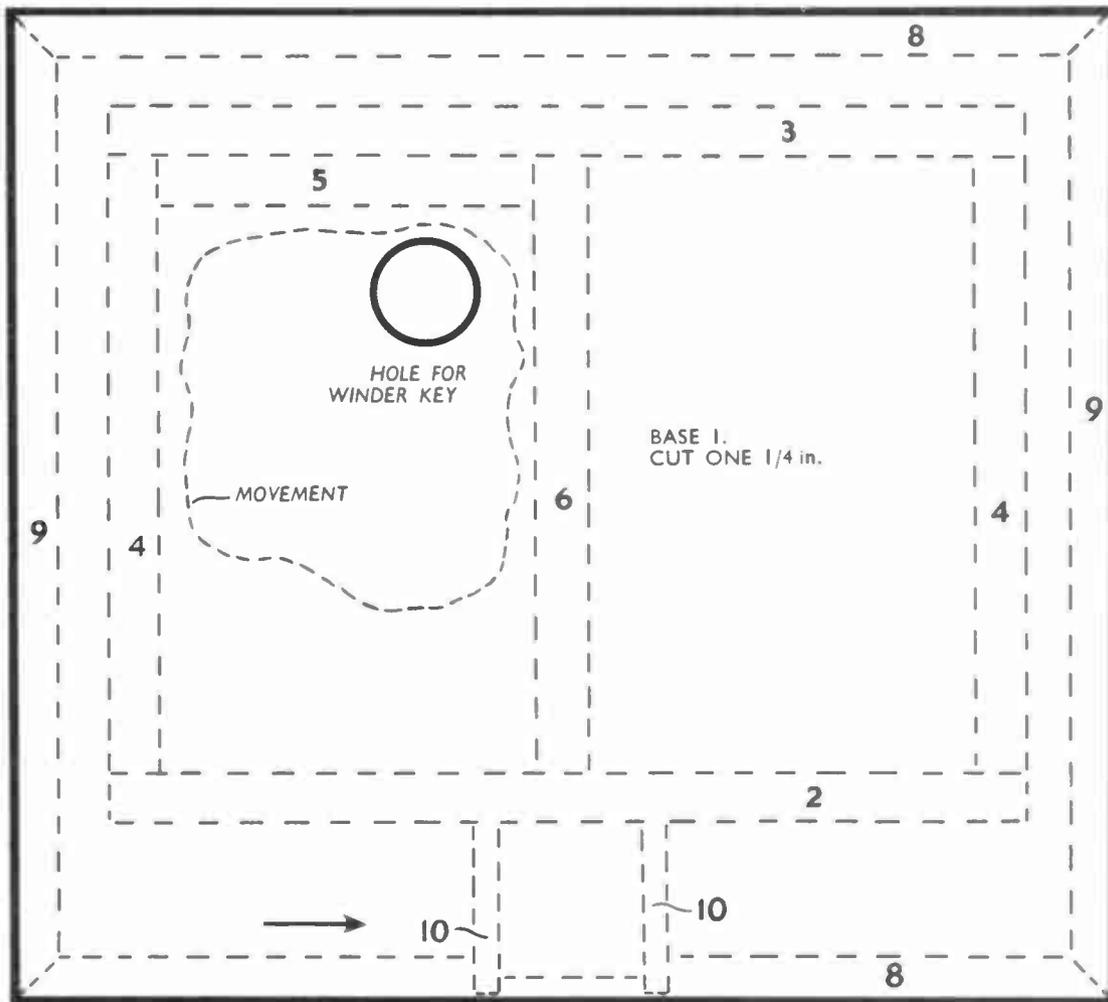
Complete plans for building the 'Wensum' Sailing Dinghy are available from Hobbies Ltd, price 16s. 0d., plus 9d. postage. The plans include all the information needed to build the boat — full-size drawings of the frames and other shaped parts, several other detail drawings, a material schedule and step-by-step instructions — for rowing, outboard motor, and sailing.

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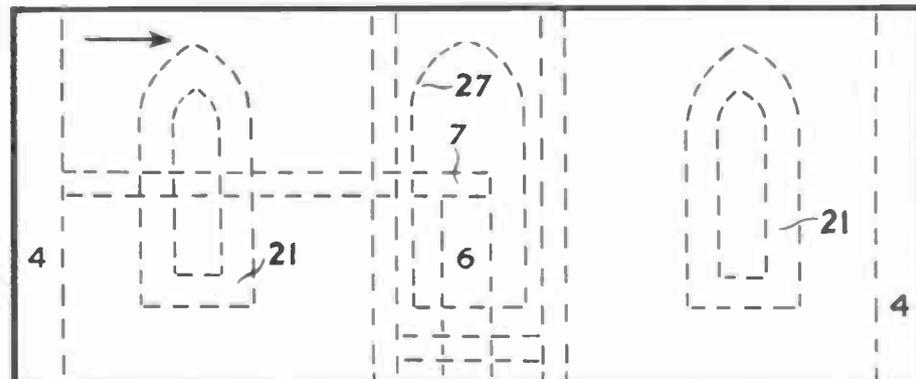
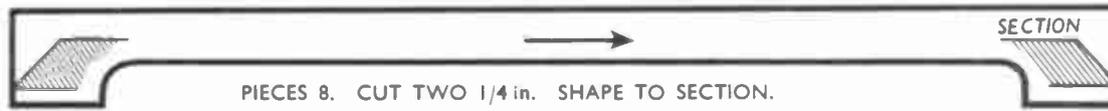
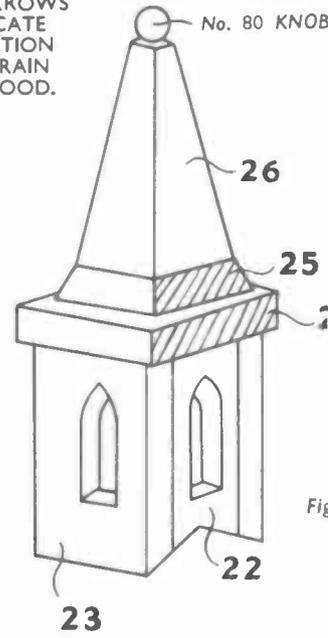
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The 'Wensum' dinghy sailing under gunter sloop rig. A suit of sails can be bought for £10-£15, or can be made by the sailing enthusiast himself.

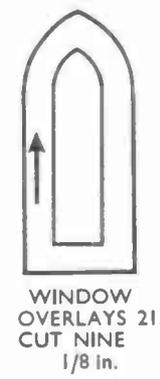


THE ARROWS INDICATE DIRECTION OF GRAIN OF WOOD.



FRONT 2. CUT ONE 1/4 in.
BACK 3. CUT ONE 1/4 in.

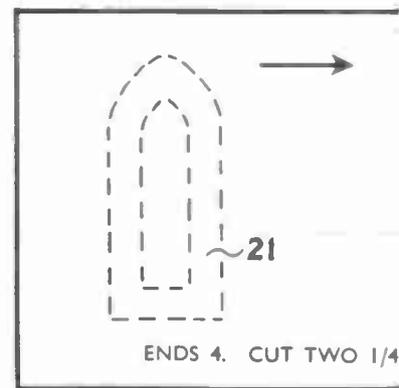
PORCH IS ON FRONT ONLY
(WINDOW ON BACK).



WINDOW OVERLAYS 21.
CUT NINE
1/8 in.



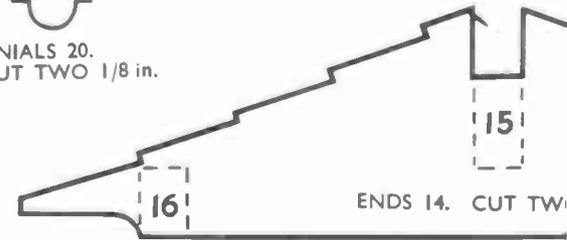
PIECE 26.
CUT ONE FROM
3/4 in. SQ. STRIP



ENDS 4. CUT TWO 1/4



FINIALS 20.
CUT TWO 1/8 in.



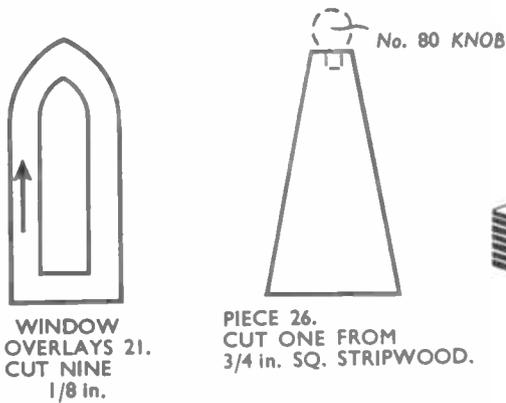
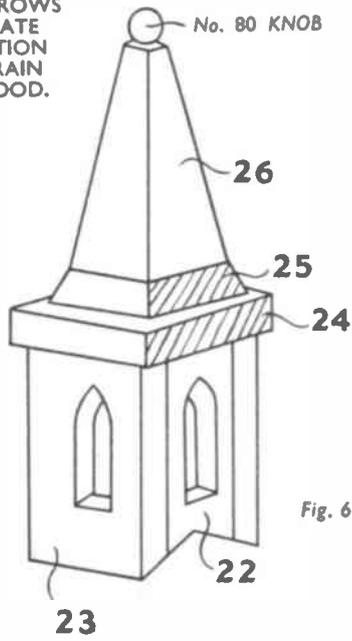
ENDS 14. CUT TWO

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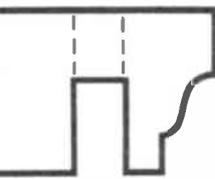
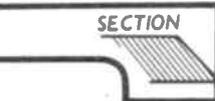
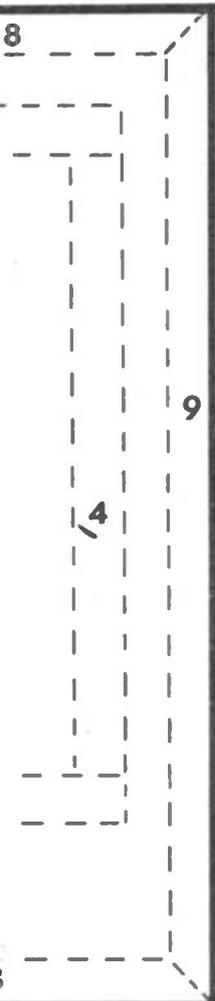
SIZE 7 ins. HIGH. 5½ ins. LONG.



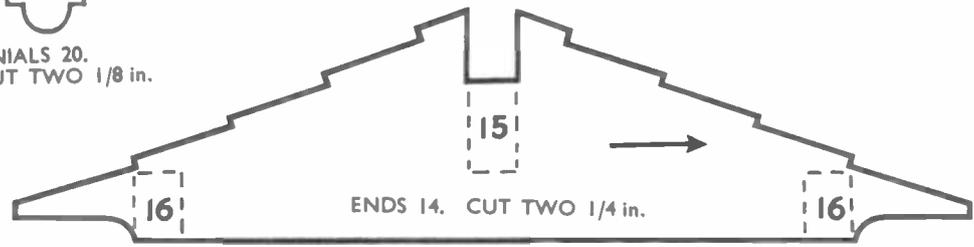
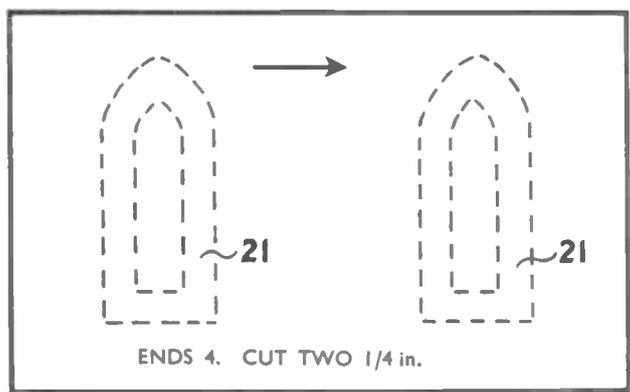
THE ARROWS INDICATE DIRECTION OF GRAIN OF WOOD.



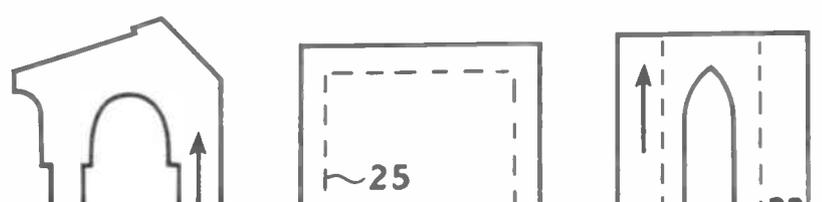
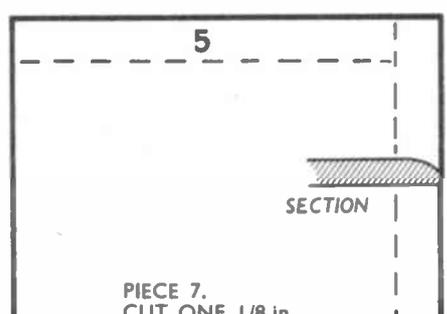
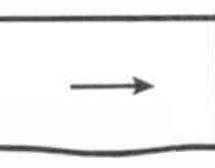
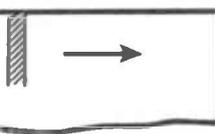
A KIT OF MATERIALS FOR MAKING THIS DESIGN IS SUPPLIED BY HOBBIES LIMITED DEREHAM, NORFOLK. PRICE ON APPLICATION.

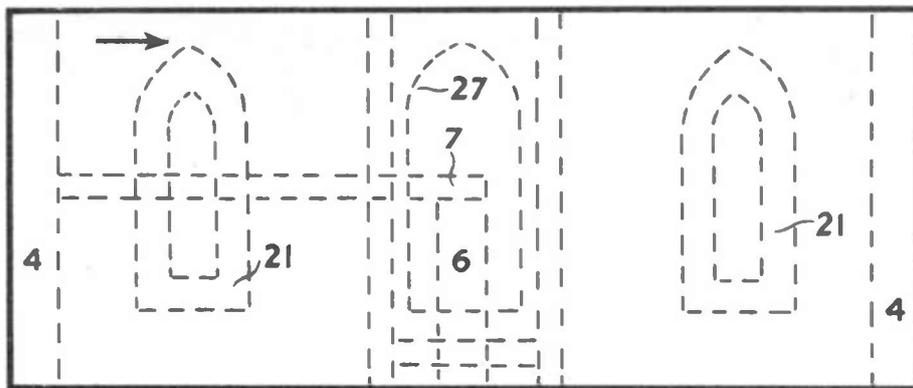
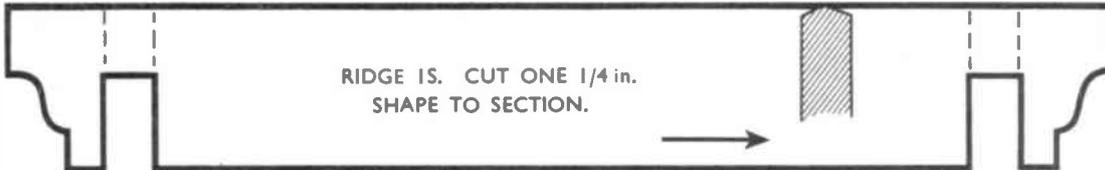
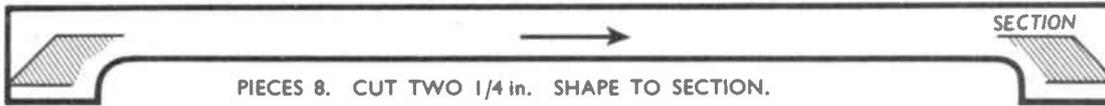
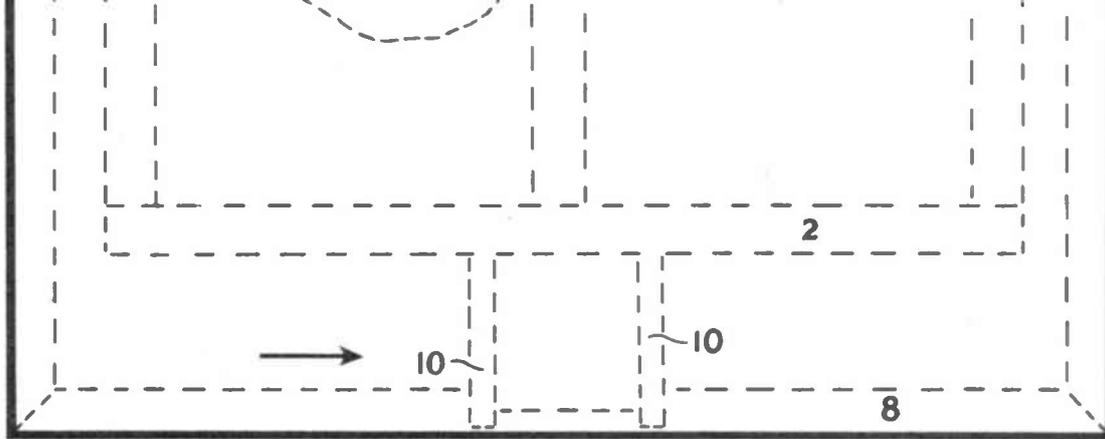


FINIALS 20. CUT TWO 1/8 in.



NOTE — TRACE AND CUT TO OUTSIDE OF THICK LINES.



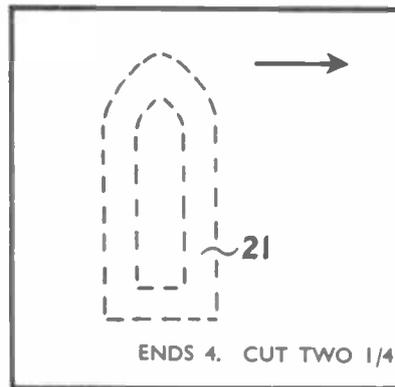


FRONT 2. CUT ONE 1/4 in.
BACK 3. CUT ONE 1/4 in.

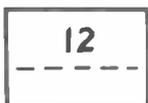
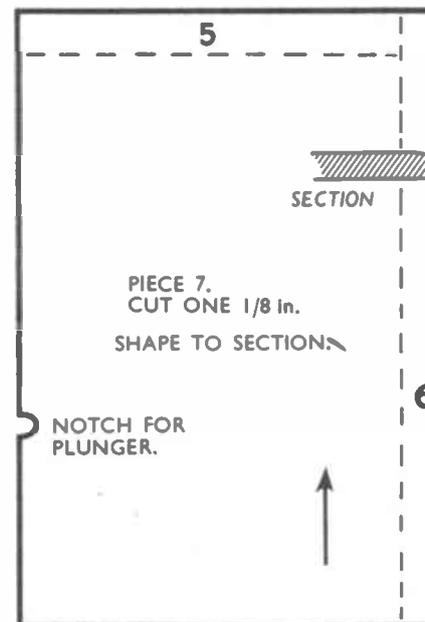
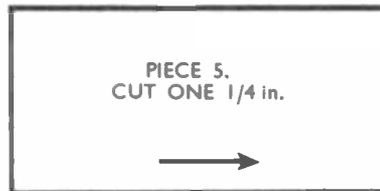
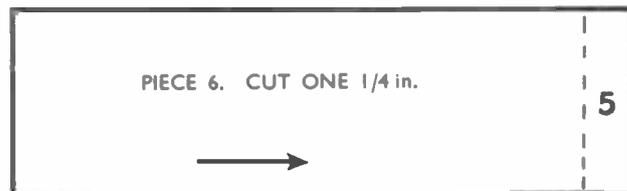
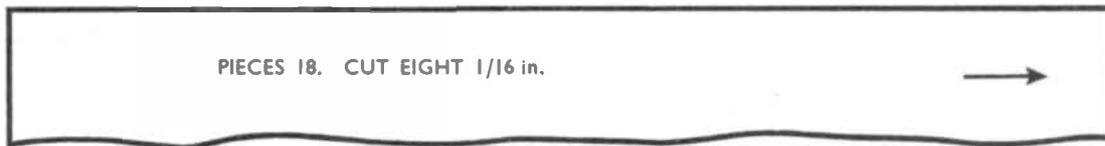
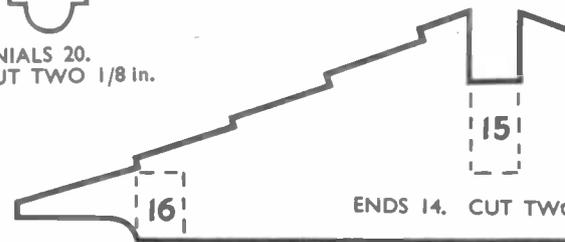
PORCH IS ON FRONT ONLY
(WINDOW ON BACK).



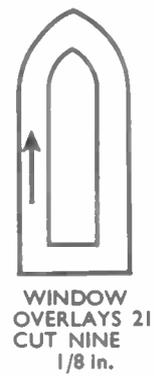
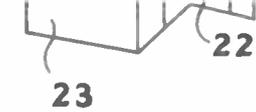
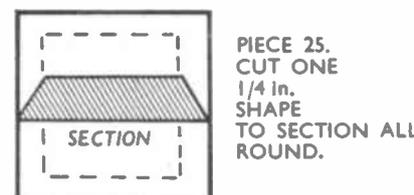
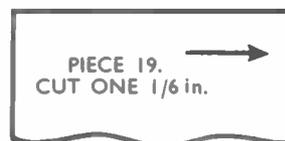
FINIALS 20.
CUT TWO 1/8 in.



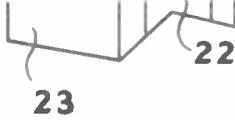
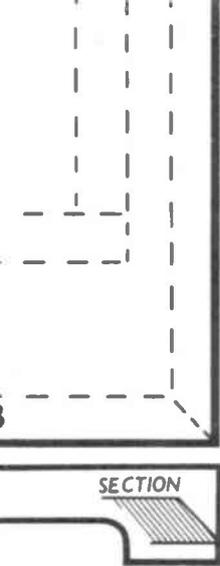
ENDS 4. CUT TWO 1/4



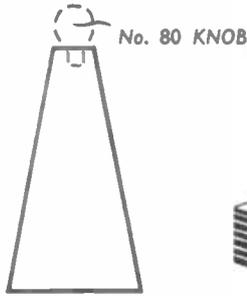
STEPS 11, 12 AND 13.
CUT ONE OF EACH 1/8 in.



PIECE 26. CUT ONE FROM 3/4 in. SQ. STRIP



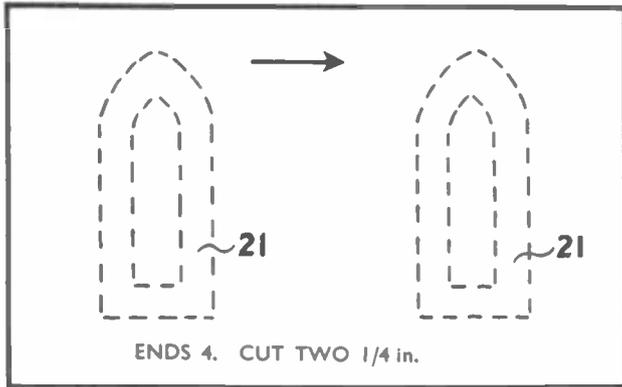
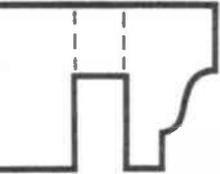
WINDOW OVERLAYS 21. CUT NINE 1/8 in.



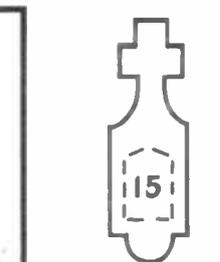
PIECE 26. CUT ONE FROM 3/4 in. SQ. STRIPWOOD.



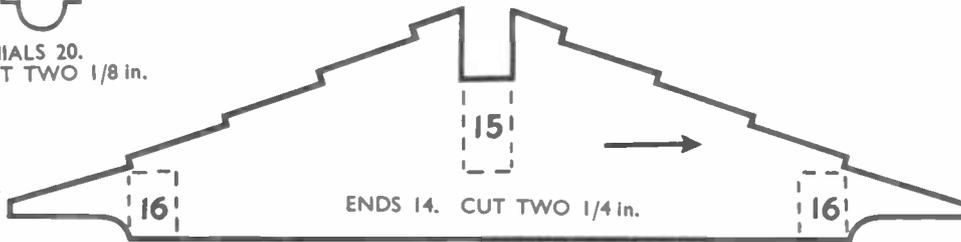
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ENDS 4. CUT TWO 1/4 in.

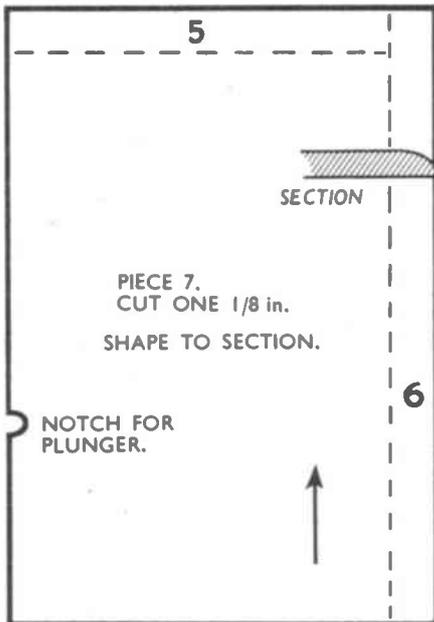
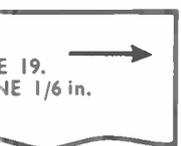
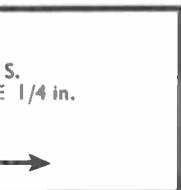
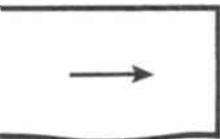
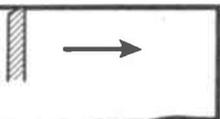


FINIALS 20. CUT TWO 1/8 in.



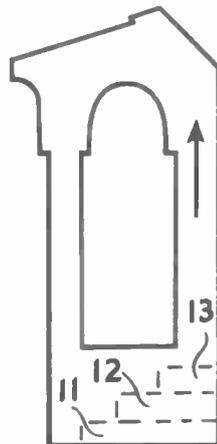
ENDS 14. CUT TWO 1/4 in.

NOTE — TRACE AND CUT TO OUTSIDE OF THICK LINES.

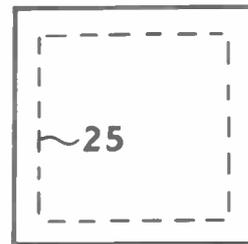


PIECE 7. CUT ONE 1/8 in. SHAPE TO SECTION.

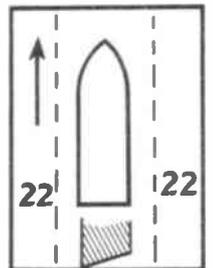
NOTCH FOR PLUNGER.



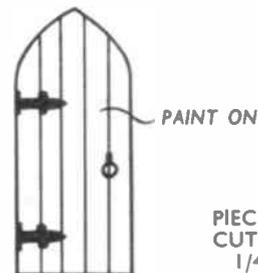
PIECES 10. CUT TWO 1/8 in.



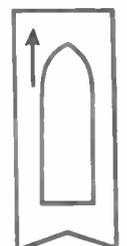
PIECE 24. CUT ONE 1/4 in.



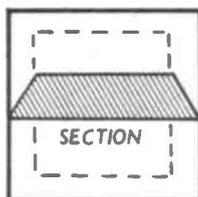
PIECES 23. CUT TWO 1/4 in. SHAPE LOWER EDGE TO SECTION.



DOOR 27. CUT ONE 1/8 in.



PIECES 22. CUT TWO 1/4 in.



PIECE 25. CUT ONE 1/4 in. SHAPE TO SECTION ALL ROUND.