

HOBBIES WEEKLY

JULY 23rd 1958

VOL. 126

NUMBER 3273

IN THIS ISSUE

	Page
Hobby Horse	241
Model Mark XI Lotus	242
Decorative Metalcraft	243
Ready-made Letters	245
Photographing Church Windows	246
Interesting Locos — No. 10	247
Design for Cigarette or Trinket Box	248
Amateur Transmitting	250
Rocks and Pebbles	252
Collectors' Club	254
Patterns for 'House Martin' Spill Holder	255



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

CHOICE OF
THREE
DESIGNS



DIAGRAMS ARE GIVEN ON NEXT PAGE

Make a HOBBY HORSE

ONE horse and three 'heads', or at least three designs for alternative heads — that is the new 'Hobbies' horse. You may choose from the conventional horse's head, the streamlined motor cycle or the 'jet age' moon ship. Suitably painted it will make a pleasing gift for any boy or girl.

The diagram in Fig 1 shows the general construction. The main bar is 30ins. long and 2ins. wide. It is cut from $\frac{3}{4}$ in. thick wood. The axle is 4ins. long by 2ins. wide and $\frac{3}{8}$ in. thick. A halved joint is made between the bar and the axle to give added strength. Secure with screws and waterproof glue.

The head is slotted on to the bar as shown in Fig. 1. Secure with two long screws driven in at an angle and use waterproof glue for extra strength.

The three shapes are shown in Fig. 2. Enlarge the squares to 1in. and draw in the shape to be used, square by square.

241

FOR ALL HOME CRAFTSMEN
Over 60 years of 'Do-it-Yourself'

4¹/₂^D

World Radio History

Use $\frac{1}{2}$ in. thick wood and cut out with a fretsaw. The handle consists of a piece of $\frac{1}{2}$ in. diameter round rod 9 ins. long. It must be a tight fit and should be glued in position.

The wheels should be 3 ins. diameter and are pivoted to the axles by means of round head screws. Suitable washers are inserted as shown in Fig. 1.

Suitable wheels, either wood or rubber tyred can be obtained from Hobbies Ltd., Dereham, Norfolk. You can of course cut wheels from $\frac{1}{2}$ in. plywood and treat them with wood preservative before painting.

Clean up well with glasspaper, rounding all edges, particularly the long bar. Give one coat of wood preservative and allow to dry before painting with enamel. Colours should be as bright as possible, but the choice is left to the worker. (M.h.)

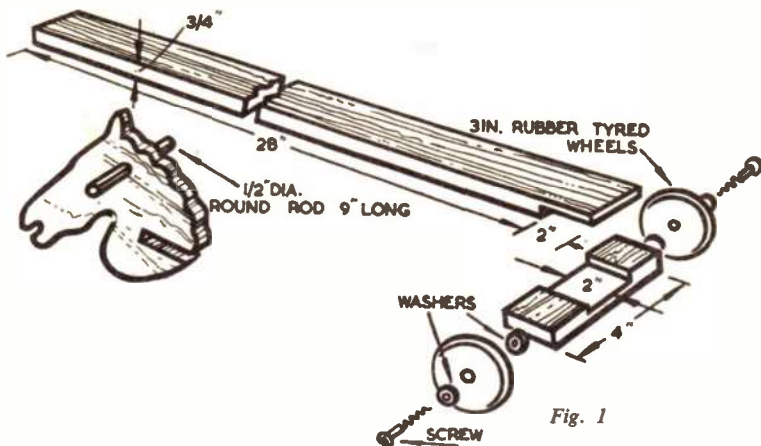


Fig. 1

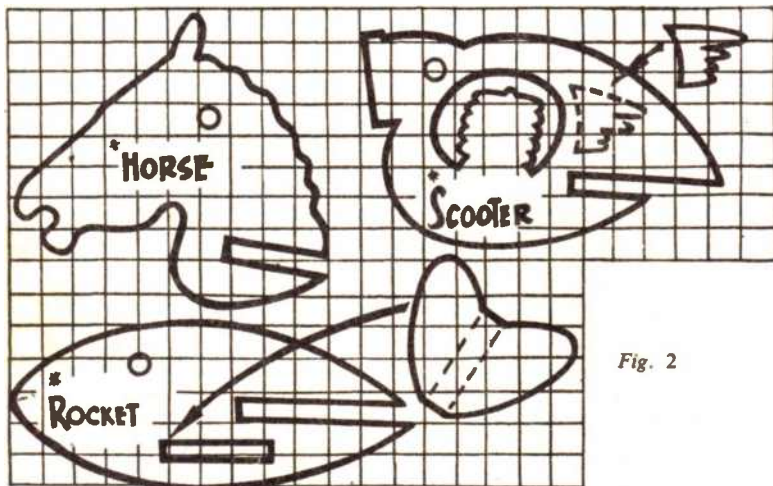


Fig. 2

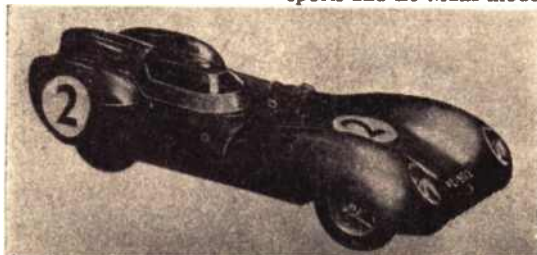
Model Mark XI Lotus

HERE is a completed model made from the latest all-metal construction kit of the well known Mark XI Lotus. When polished in its natural metal this model captures the exciting appearance of its original.

Priced at 69/- post free, each kit contains a set of metal castings drilled and

ready for bolting together, screws, metal spoke wheels, racing numbers, perspex (for windscreen and lights), paint set, plinth and display case.

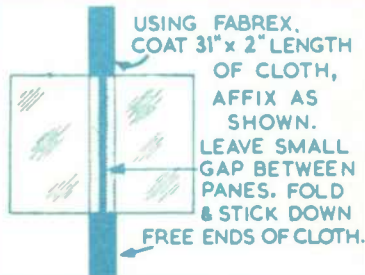
Graphic Designers Ltd., of 4 Holly Park, London, N.3 inform us that there are four kit versions for the enthusiast to make up including the Lotus XI Club, sports and Le Mans model.



FIVE-MINUTE CLOCHES

ON TWO PIECES OF 15" x 10" GLASS, PAINT 1" WIDE STRIPS, USING FLAT OR PRIMING PAINT.

LEAVE UNTIL DRY.



THE FINISHED CLOCHE



FOLDS FLAT WHEN NOT IN USE

Our free design next week will be for a model Fort—always popular with boys. Make sure of your copy.

DECORATIVE METALCRAFT

THIN copper sheeting is an eminently useful, inexpensive material for modelling embossed plaques, panels, fingerplates, nameplates and many other ornamentations for boxes. The tools required are few, and with a little ingenuity many may be improvised, while an oxidised finish provides an added attractiveness.

By S. H. Longbottom

This material is soft and pliable, unlike brass and some alloys, enabling the worker to make impressions quite easily, so any beginner may attempt the craft without fear. You may be able to obtain copper sheeting of thin gauge from a handicrafts shop, but if unsuccessful you are recommended to try a shop where sheet metal is sold. A piece measuring 6ins. by 12ins. usually costs 1/6, although it is actually sold by weight. In the following it is proposed to deal with the

the outline of the design in the copper. It will be seen that this tool is held exactly like a pencil, between the thumb and first finger, but the first finger of the left hand should be placed on the shank to help control of pressure and to guide the stroke, the latter always moving from left to right. You are recommended to practice the use of this tool on scrap metal before embarking on the actual work.

Then we have the modelling tool, which is a little flatter at the end although curved upwards. Reference to Fig. 3

scribed. You may also use a nail—providing the sharp point is filed away. Tooth-picks, penholder ends and some wooden clay modelling tools are also useful, while a spoon end will serve the purpose of the modelling tool quite successfully. When alternatives are used the main thing to remember is that they must not be too sharp or they will pierce the metal.

Designs

All designs are best made on transparent tracing paper, but omitting all

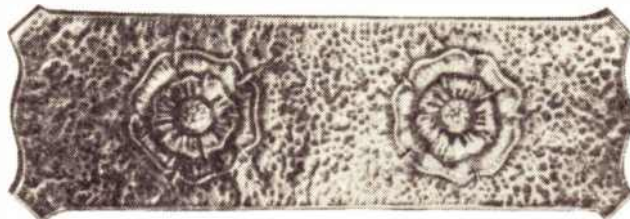


Fig. 1—Fingerplate in copper with Tudor Rose motif.

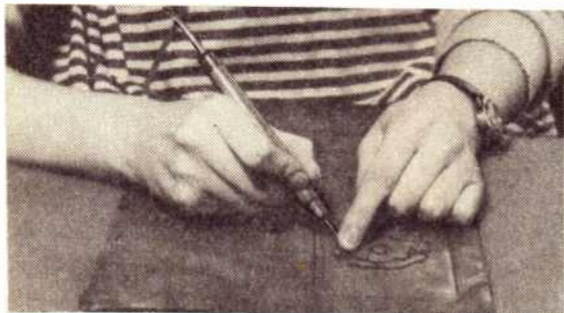


Fig. 2—Here the bent tracer is being used to impress an outline on the back of the sheeting.

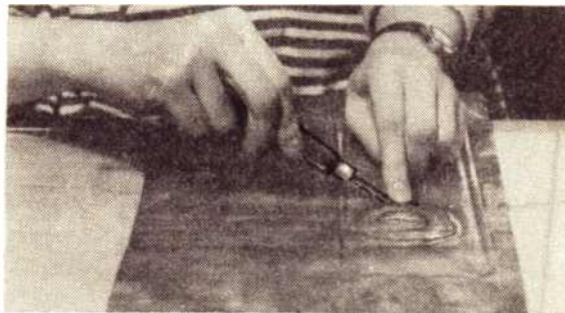


Fig. 3—The modelling tool is being used here on the face of the sheeting to flatten the edge of the design. Note difference in holding.

subject step by step and to include tools, designs, method and finishing so that you will be fully competent to embark on any work you choose.

Tools

One of the most important items in this craft is the tools used, and fortunately these are few in number. First we have what is termed a straight tracer for making the first outline of the design, and as may be expected it is a straight piece of metal, set in a wooden handle, something like a nail. It is used quite lightly so that any adjustments or alterations can be made. Next is the bent tracer, a similar tool to the first mentioned but curved at the end. This is being used in Fig. 2 and is required to impress

will reveal that this tool should be held a little differently so that the outer curve of the end always points upwards and is never in actual contact with the copper. This tool is used for making deeper and wider impressions in the metal and also for flattening on the face side after using a tracer. Again, some assistance is required from the left hand.

Other tools are punches for background work and a ball tool, and all of these may be bought at reasonable prices, normally being used for pewter work. Now let us see what alternatives we can find.

A piece of dowel rod sharpened like a pencil will be found quite suitable for working this soft metal and will compare favourably with the two tracers de-

fine detail, which is inserted freehand during the modelling process. You may choose any design you wish but some regard must be given to the proposed treatment, that is whether the whole is to be traced or punched. The specimen shown involves a Tudor rose and it may be helpful to explain the precise method followed in order to obtain a perfect balance. The various stages are shown in Fig. 4. First a circle is divided into five equal parts by using a protractor, measuring off angles of 75° , each portion being necessary for a petal. The next step is the bisection of one of these sections for preparation of half a petal, (shown in 4b). Half of the pattern is drawn, copied on tracing paper which when reversed, enables the balancing half to be completed

as in 4c. By completing the full section on transfer paper it becomes an easy matter to produce the entire flower design.

With the flower design prepared, the next step is to transfer this to another piece of paper with the panel outline. Again it is preferable to prepare all curves in halves so that they are nicely balanced. The master transfer is completed by positioning the two flower designs each equidistant from the ends and we are ready for tracing on the sheeting. For your guidance it may be mentioned that the fingerplate shown in Fig. 1 measures 9ins. by 2½ins.

By using this method it is possible to produce any perfectly balanced design and where the circle is used as a base you have merely to divide 360° by the number of sections in the pattern to determine the required angle.

Transferring to Copper

Place the copper sheeting face (the bright side) downwards, a piece of carbon paper on top, then the prepared pattern transfer. To keep these in position it is best to fasten down with strips

nesses of duster material, placed on a sheet of hardboard. Now, with the bent tracer held as directed, firmly impress the outline of the design on the back of the material to produce a raised effect on the front (Fig. 2). Turn the sheeting face upwards and, using the modelling tool, flatten down the background adjoining the line impression. Run this tool close up to the edge of the impression, slowly but surely, and you will find that this produces well defined edges to the pattern which stands in relief.

As previously mentioned some patterns may perhaps look better if punched design rather than a raised line is used so it is now proposed to deal with this.

Punched Work

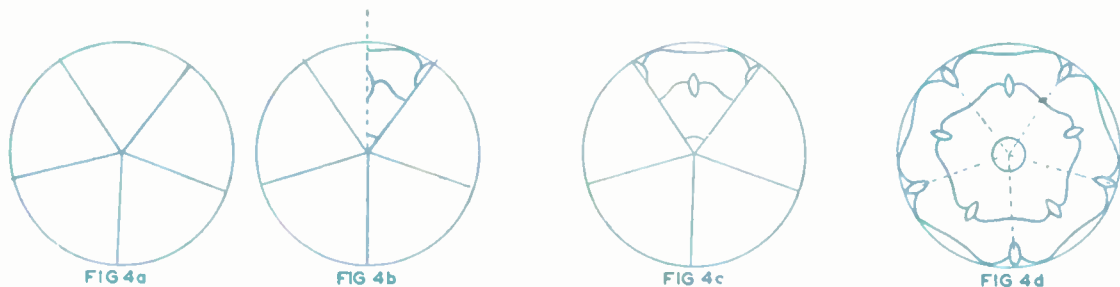
As an alternative to the outlining method it is possible to use a punch with a rounded end, making a series of dots to form the pattern, but which appear in relief on the face. Examples of such patterns are shown in Fig. 5, but it should be noted that instead of using dusters a firm base is required — like hardboard — and the punch must not be sharp pointed or you will pierce the metal.

necessary to avoid any damage to the outline already traced.

From time to time the work is turned over for inspection and comparison, while fine details, such as the veins in leaves, or petal marks, can be impressed with a fine tracing tool. All these artistic touches are entirely a matter for the individual worker, but it should be noted that it is inadvisable to introduce too much detail.

When the relief work has been completed on the back of the metal the sheeting is turned on to the face and laid on a hard base. Here the background is pressed down flat with the fingers until quite flat, or you may lay it on a soft surface face downwards and rub with a duster. Both methods will be effective for curing any curling tendency which has arisen.

The entire background may be treated with a tooling punch, but one which has a small set of dots at the end. The method is to keep the sheeting on a hard base face upwards, applying a hammer to the punch in order to produce a stippled effect all over the plain background, but as will be seen later we have



of Sellotape at the edges. Trace over the design lightly with a sharp pencil, using a ruler for any straight lines.

When the design has been completely transferred to the copper we may commence the actual work of tracing and modelling. Remove the tracing paper, etc., placing the copper on a firm base but with double thickness of duster material underneath in order that a good impression may be achieved. Remember that work is done on the back of the material. It should be mentioned here that when the material was cheaper some workers preferred to use lead as the base, while others use leather or folded newspaper and it will be realised that these different bases affect the degree of the impression. For your purpose you will perhaps find duster material quite convenient.

Tracing and Outlining

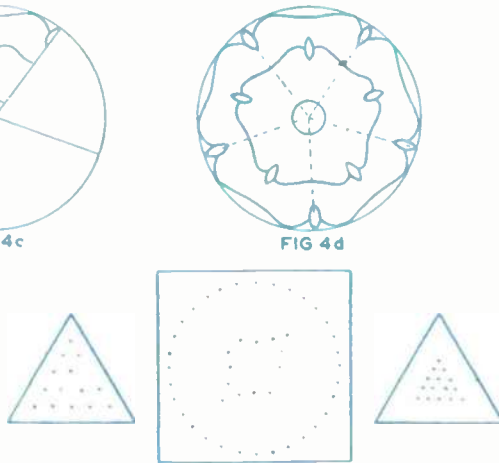
The pattern has now been transferred to the sheeting as described in the foregoing and the sheeting should be laid on a soft base of, say, one or two thick-

nesses of duster material, placed on a sheet of hardboard. Now, with the bent tracer held as directed, firmly impress the outline of the design on the back of the material to produce a raised effect on the front (Fig. 2). Turn the sheeting face upwards and, using the modelling tool, flatten down the background adjoining the line impression. Run this tool close up to the edge of the impression, slowly but surely, and you will find that this produces well defined edges to the pattern which stands in relief.

Again, you may use a piece of dowel rod for this purpose or purchase a small tooling punch. If dowel rod is used it should not be more than six inches in length, held quite vertically and given sharp taps with a hammer. Try to aim for a regularity in the strength of the blows or some dots will be more raised than others. Moreover, for good work it is essential to see that the dots are quite evenly spaced and the work should only be undertaken in good light.

Modelling

Here we aim at making deeper impressions on the sheeting, as, for example, in the petals of the design, the copper is placed faced downwards on a soft duster base and the modelling tool used to press out the relief portions of the design. This is done quite steadily and gradually as described previously, but it should be realised that care is



alternative methods of treatment at our disposal.

Finishing

In order to prevent the modelled parts from being flattened again or damaged during subsequent polishing, it is advisable to fill all hollows arising in the design with some plastic substance. You may use Plasticine, well softened in the hands and pressed flat into the depressions, wax, or a crack filling substance like plaster of Paris. The latter should be mixed to a smooth paste, spread on the

• Continued on page 245

READY-MADE LETTERS

A WELL drawn plan, diagram or map is quite often spoiled by badly formed lettering. People who can produce intricate and beautifully executed designs frequently fail to draw a nice alphabet and the reverse is often the case.

By means of a simple little stencil plate, all the letters of the alphabet together with the numerals and various signs can be executed by anyone. No previous experience is necessary and the letters can be guaranteed accurate and uniform.

Another important feature is the speed with which they can be done.

The stencil plate is easy to make with a fretsaw in a wide range of sizes from very small letters and figures to those of quite considerable dimension. It is not however necessary to cut out all the letters of the alphabet and figures as all of them can be formed from about a dozen basic shapes. Reference to the chart will clearly show how nearly 50 characters are constructed from just these few simple shapes.

The alphabet shown is the Egyptian or block capital letter, but it would not be difficult to design and cut stencils of other types. Small letters to go with the capitals. Roman capitals and their smalls and the various italic alphabets are all suitable for the same treatment.

Transparent plastic such as perspex is the ideal material for making the stencil

although thin sheet metal can be used. When using transparent stencils you are able to see through the material, with the result that it is possible to get the spacing correct whereas a metal plate

does not allow this visual aid to be used.

To use the stencil, place a rule or T square across the paper or card and then slide the plate along to the appropriate sign and draw round with a sharp pencil. Some letters such as O, V, L or E can be completed with one sign, but others may need two and this includes N, W, X and 6. No previous marking out with guide lines is needed and you can commence lettering directly you place the stencil on to the paper.

A better outline is obtained when thin material is used but this should not buckle when running the pencil round the outlines. The thickness also should be increased for larger alphabets.

It is very important to make the stencil plates with perfectly parallel sides and the various signs must also be placed exactly in the centre and run parallel with the sides. Much of its success will depend on how well the initial setting out of the plate has been made and it will pay to do this very carefully.

Having set out the plate the cutting demands equal attention and is best done with a very fine fretsaw so as to get a smooth outline. Finish off also with a fine file or piece of smooth grade emery paper.

When drawing the letters use a well pointed hard pencil so as to obtain a clear, sharply defined outline which can afterwards be inked in or painted in colours. (A.F.T.)



● Continued from page 244

Decorative Metalcraft

back of the ornament, the top skimmed with a straight edge and allowed to set before mounting or polishing. But before doing this you may care to give the copper and antique, oxidised finish when the relieved parts are bright against the black impressions.

Oxidising

First clean the face of the copper sheeting to remove all traces of grease with a pad soaked in methylated spirit, otherwise the resultant oxidising will be patchy. Now dissolve a piece of liver of sulphur, about the size of a walnut, in one quart of warm water — this chemical costs about sixpence per ounce and half an ounce will be quite sufficient for most small work. You will also want an earthenware or enamelled dish for the solution.

Immerse the ornament in this solution until it turns black, or you may apply with a paint brush. Liver of sulphur has a rather obnoxious odour which will

disappear when the oxidising process is complete. Nevertheless, it is wiser to avoid transfer of the solution to the hands, or spilling on the clothes, so you are recommended to work at the sink.

Once the sheeting is dry it is ready for the final polishing to produce the two tone effect, and all that is required is a little steel wool. The latter is rubbed all over the face of the designing when the highly relieved parts are freed from the black oxidation and show up brilliantly against the darker background. Finally, the whole may be protected by an application of clear lacquer. It will now be realised that any filling on the back should be applied after oxidising.

Painted Finish

As already mentioned, it is not always necessary to punch a stippled effect on the background and another charming effect can be achieved by merely tracing the outline with the fine tracer, painting the background with any enamel type

paint after cleaning with methylated spirits. Polishing with steel wool remains necessary but here it should be done before the paint is applied.

It has been assumed throughout that sufficient care was taken at the commencement to make the ornament of suitable size for a box, or similar receptacle. A finger plate can be fastened to the door by small copper nails at the corners after punching holes of suitable size, and this method of fitting applies to most objects.

You will find the craft suitable for adorning boxes for cigarettes, tobacco, playing cards or letter racks and book ends. If you wish to tackle larger subjects there are fenders, fire screens, name plates, honours boards and trophies in the form of plaques. Copper sheeting will be found extremely suitable for all these objects for it is extremely easy to work with simple tools.

Remember to build up balanced designs and make careful measurements before starting, but if you prefer, you may always buy prepared stencils of lettering or leafy patterns to make your task still easier.

Photographing Church Windows

Tips for the camera enthusiast who wants to record these interesting and historic stained glass pictures.

By A. Nettleton

THE stained glass windows in our churches are a varied and absorbing legacy, and they provide attractive subjects for the camera. Collecting photographs of them is a pleasant pastime, and although it is a specialised branch of camera work it is not difficult.

It does not call for costly equipment, and it has the further advantage of being an all-seasons pastime. Church windows can be photographed in almost any kind of weather, and it is certainly attractive to be able to pursue photography in comparative comfort when the day is wet or cold. Outdoor work may not appeal at such times, but if a church can be reached, many a pleasant hour can be spent in making photographic records of its windows.

Permission should be first obtained from the vicar or vergier; it is rarely refused, provided one emphasises that the



A panel at Middleton, near Manchester, showing the old Grammar School.



An old family crest in a window of Guiseley Church, near Leeds.

photographs are not required for postcards or similar commercial use. The taking of postcard pictures for general sale is banned by some church authorities, chiefly those who add to the church funds by selling such cards to visitors, and who therefore grant a concession to a local photographer, but the ordinary amateur photographer is seldom prohibited from taking pictures for his private use.

The first rule in photographing stained glass windows is to avoid general views. They are seldom satisfying and the best results will be obtained by concentrating on close-ups of details. Much of the charm and interest of such subjects lies in the figures, biblical scenes, armorial bearings, and other features which they display.

Individual panels often

show pictures of great interest. A Harrogate church has a window containing a reproduction of a *Punch* cartoon; a panel at Middleton, near Manchester, shows the town's old grammar school; in the same church is a window depicting archers kneeling in prayer before setting out for Flodden Field; and in Bingley church, Airedale, a tiny picture of the old market cross is to be seen in the border of one colourful window.

The church guide-books on sale at many places today are worth studying by the photographer, for they often draw attention to subjects of this kind, which would probably otherwise be overlooked.

Since this is largely close-up photography, the camera must be capable of focussing down to about 5ft. Small panels may have to be photographed from no greater distance than that.

A camera with a focussing screen, such as a single-lens or twin-lens reflex, is a boon. But good results can be obtained with a folding camera, provided it has a good eye-level viewfinder. A tiny reflecting viewfinder is hardly suitable, the image it provides being too small for easy examination.

Focussing need not present much of a problem. Although critical definition is

essential, a camera with a focussing screen or a built-in rangefinder will take care of this matter. The photographer using a less costly camera can use a separate rangefinder to determine the distance, and set the lens to this figure.

A tripod, whilst sometimes useful for church window photography, is not required as often as first thoughts may suggest. Since the subject is lighted from the rear, and the picture is not being taken by reflected light, exposures can be much shorter than those required for most indoor church subjects, and are often short enough for the camera to be hand-held.

Both the illustrations accompanying this article were taken without a tripod, the exposure being 1-25th sec. at $f/8$ on a medium speed film. Fast films, indeed, are rarely needed except in mid-winter or on very dull days, and it will be found that it is often easier to over-expose than to under-expose!

Over-exposure is to be guarded against, for the range of contrasts in a stained glass window is wide, and too much exposure will clog the highlights. There is a further advantage here, for the brilliance of the subject means that a colour filter can be placed over the lens to give more faithful rendering of the colour tones, without increasing the exposure to such an extent that a tripod is required.

Panchromatic film

Whether a filter is used or not, the camera should be loaded with a panchromatic film. Only these films will give faithful rendering of multi-coloured windows. Excessive contrasts can also be avoided by making the exposure when the sun is obscured. The best results are rarely obtained when the window is lit up by direct sunshine.

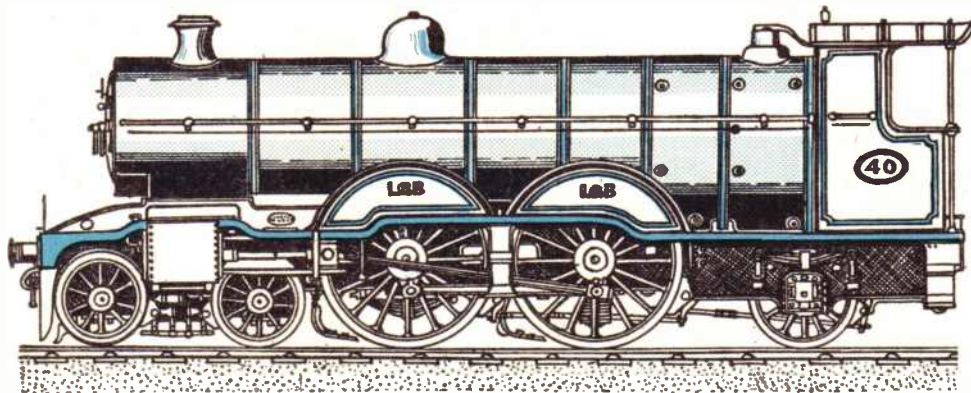
Church window photography also offers excellent scope for colour work,

and most of the foregoing advice applies to this, too. Even in colour, the most satisfying pictures are close-ups of panels rather than general views. For this reason the camera taking 35 mm. film is not as useful for such colour work as the one giving pictures 2½ ins. square or larger.

Much of the attraction in stained glass window photographs lies in the reproduction of small details, and these are apt to become lost on 35 mm. film, even when the transparencies are examined through a magnifier or projected on to a screen.

Colour pictures also demand more accurate exposure than monochrome ones, but with colour films of greater latitude now becoming available, photographing church windows in full colour is being made easier. Even in monochrome, however, such subjects afford interesting work for the record photographer.

Interesting Locos - No. 10



THE BRIGHTON 'ATLANTICS'

PERHAPS one of the most successful of the 'Atlantic' type locomotives to run in this country although not built in large numbers, were the handsome class 'H1' engines designed by Mr. Douglas Earle Marsh at Brighton in 1905. These engines, five in number, were at the time the largest locomotives to be seen on the L.B. & S.C.R. and they were all built by Kitson's of Leeds, being the last engines built for the L.B.S.C. by an outside maker. They were numbered 37 to 41 inclusive, the first one being built in December 1905 and the remainder in 1906, and they carried makers Nos. 4351 to 4355 inclusive.

They were Mr. Marsh's first product for the Brighton line since becoming Locomotive Chief in January 1905. It may be recalled that Mr. Marsh was formerly with the Gt. Northern railway

at Doncaster under Mr. H. A. Ivatt, and the 'H1' engines incorporated many features similar to Mr. Ivatt's G.N.R. large 'Atlantic'.

The 'H1' class carried the following leading features; cylinders 18½ ins. by 26 ins. (except Nos. 39 and 41 which had 19 in. diameter cylinders), coupled wheels diameter 6 ft. 7½ ins., boiler outside diameter 5 ft. 6 ins., length of barrel 16 ft. 3½ ins. The firebox was of the Wootten pattern with the grate resting on top of the main frames. The boiler working pressure was 200 lbs. per sq. in. The total length over the buffers with tender attached was 59 ft. 8 ins., and the total weight (engine and tender) in working order was 98 tons. The tender carried 3,500 gallons of water and four tons of coal.

In 1911 Mr. Marsh built a superheated

version of the 'H1' class. These were classed 'H2', and were numbered 421 to 426 inclusive having larger 21 in. diameter cylinders. Both types were taken over by the Southern Railway in 1923.

YOU CAN'T BEAT THIS CLOCK

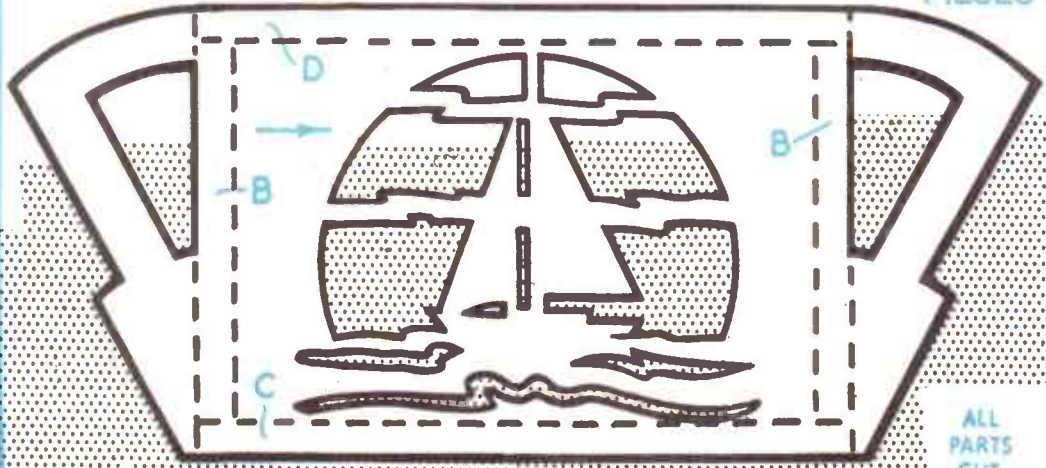
A 'GO-SLOW' clock, which speeds itself up when required, is the last word in photographic processing. When the developer is cold, a longer time is needed to complete the action than when it is warm.

This new 'temperature-dependent' clock measures the exact temperature of the liquid — then runs fast or slow to provide exactly the right developing time. With this device accuracy of processing is claimed to have been improved by as much as 20 times.

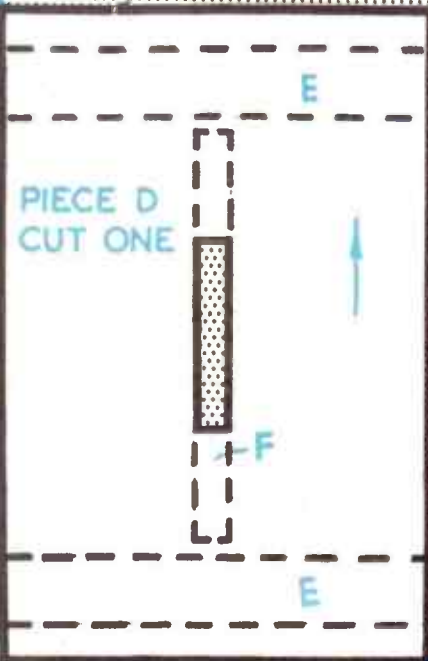


DESIGN FOR MAKING

PIECES A CUT TWO



ALL PARTS CUT FROM 3/16IN. WOOD



ARROWS SHOW DIRECTION OF GRAIN OF WOOD



A

CIGARETTE TRINKET BOX

OR

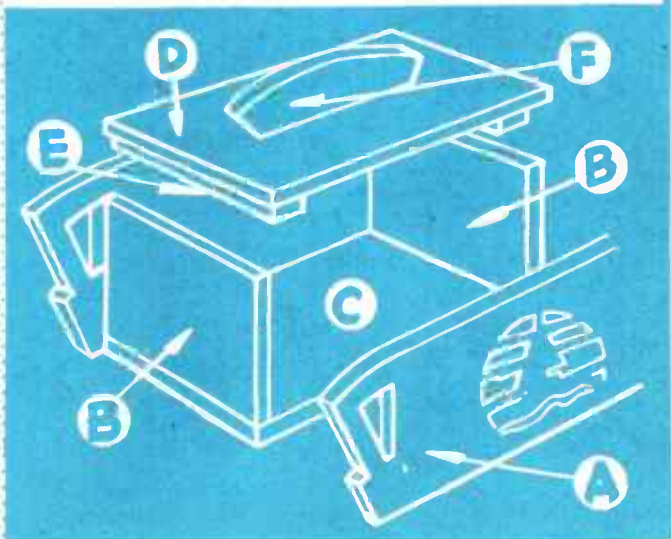
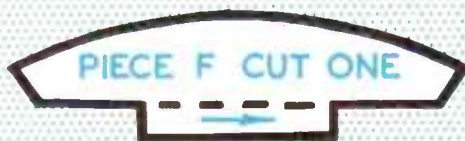
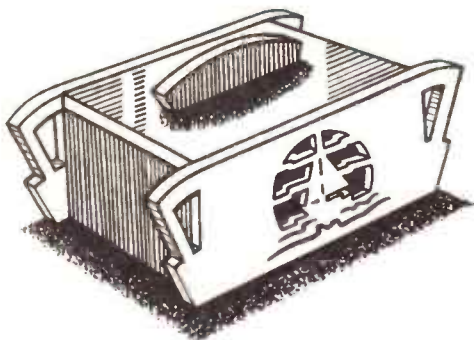
suitable for a musical movement

MARK the various pieces of the box on to $\frac{1}{8}$ in. thick wood. A Hobbies H3 panel, 14ins. by 7ins., will be sufficient. Use carbon paper for transferring and make sure that the grain of the wood runs in the correct direction. Parts can be traced and then transferred if desired.

Glue the back and front pieces (A), the ends (B) and the floor (C) together as shown by the exploded diagram below. Clean up with glasspaper, smoothing all edges and slightly rounding the corners. The lid consists of pieces (E), (D) and (F). Piece (F), the handle, is glued in the slot in piece (D) and the pieces (E) are glued underneath. Note that pieces (E) should fit nicely inside the ends (B) when the lid is in place.

To finish off, give a coat of woodfiller, rub down with glasspaper and give two or three coats of enamel, rubbing down the first and second coats with fine glasspaper or silicon carbide paper, used wet. Glue pieces of coloured material behind the yacht openings.

If you wish to use a musical movement, add a false floor above the movement, supported by small corner pieces. Cut a hole in piece (C) for the winder spindle and add four toes to give room for the winder handle to protrude.



AMATEUR TRANSMITTING

SEVERAL short-wave bands are reserved for amateur transmitters, who can frequently be heard in contact with each other, and from time to time readers enquire about obtaining a transmitting licence. Brief details of this licence should thus be of interest to those making a hobby of amateur radio or short-wave listening.

By F. G. Rayer

It is illegal to transmit Morse or speech, for communication purposes, without a licence. The licence is only granted to those applicants who can show that they can operate their station in such a way as to avoid unnecessary interference with commercial and other stations. Possession of a Post Office Amateur Radio Certificate is required to show that this condition will be met.

Certificate standard

The certificate is issued without charge to a person who has passed the Radio Amateur Examination, and Post Office Morse Test. The transmitting licence should be applied for within two years of the date of issue of the certificate, otherwise the Post Office Morse Test will have to be taken again.

The Radio Amateur Examination covers enough ground to ensure that the applicant can operate his transmitter properly. When sufficient applications are received, examinations are held at London, Edinburgh, and Cardiff, in October of each year, the fee being £1/5/-. The City and Guilds of London Institute, 31 Brechin Place, South Kensington, London, S.W.7 also holds examinations, usually in May. Details, and specimen question papers showing the standard required, may be obtained from this address.

Morse Tests are held at a large number of centres throughout the country. A licence applicant must pass the Morse Test, even when speech will be used for transmitting. To pass the test, it is necessary to send 36 words in 3 minutes, and 10 5-figure groups in 1½ minutes, and to receive a similar number of words and figures sent by the examiner. Punctuation and other symbols are not included in the test.

Other qualifications

The applicant must be a British subject over fourteen years of age. The licence is issued at a charge of £2, and

the renewal fee, payable yearly, is also £2.

For some time exemption from the examinations could be claimed by persons possessing suitable qualifications, such as Army, Navy, and R.A.F. signals officers, telegraphists, wireless operators, etc. But this exemption no longer applies. However, persons who have occupied such posts would probably succeed in passing the examination and Morse Test quite easily.

Amateur bands

These are as follows, and are given so that the listener with a short-wave

renewal fee, payable yearly, is also £2.

reception should certainly be obtained and worked privately, in preparation. Scouts and others who have learnt Morse for amusement may already have a sufficiently high standard, because the required 12 words per minute is not a very high speed. If not, practice with a buzzer and Morse key, with a friend if possible, will enable the code to be learnt. Or a valve oscillator can be used (as shown in Fig. 1), and this gives a better tone. If the circuit does not oscillate, reverse connections to the transformer primary. The tone can be varied by adjusting the H.T. voltage.

The Morse Code is as follows, a dash

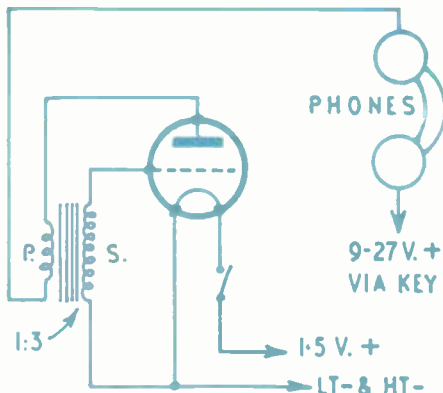


Fig. 1—Morse practice oscillator

receiver can try his hand at picking up any amateurs who may be transmitting.

being three times as long as a dot.

Frequency of Band (Mc/s.)	Approximate Wavelength (Metres.)
1.8 — 2.0	175—150.
3.5 — 3.8	86—80.
7.0 — 7.15	43—41.
14.0 — 14.35	21.
28.0 — 30.0	10.

A . . .	B	C
D	E	F
G	H	I
J	K	L
M	N	O
P	Q	R
S	T	U
V	W	X
Y	Z	
1	6	
2	7	
3	8	
4	9	
5	0	

Most stations will usually be heard during the evening, and at week-ends. There are also a number of V.H.F. (very high frequency) bands using wavelengths under 10 metres, but these cannot be tuned with the usual receiver.

Preparing for the tests

Sufficient knowledge to pass the theory examination could be gained by a period of study at home, either from textbooks, or by means of a correspondence course. The latter is fairly expensive, but does help to assure success. With home study, copies of past City and Guilds examina-

Model control

These tests do not apply to Model Control transmitting, and a licence for this may be obtained without any difficulty.

Any enquiries regarding Amateur or other transmitting licences, or requests for application forms, can be made to General Post Office, Radio Services Department, Headquarters Building, St. Martin's-le-Grand, London, E.C.1.

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ROCKS AND PEBBLES

WHEN the seaside visitor has tired of wandering along the shore shell hunting, or peering into rock pools, he will undoubtedly relax on the beach and will almost certainly start to toy with the pebbles he finds there, usually idly throwing them.

Every pebble has its origin in some rock of the earth's surface, usually a cliff face which has been battered by the waves or disintegrated by weather action. The study of pebbles is, therefore, largely the study of the rocks from which they came. A pebble is however different from a rock fragment in that it has been ground down and rounded in contact with other pebbles by the action of the waves. There are three types of rocks making up the earth's crust. These are sedimentary, igneous, and metamorphic. The sedimentary rocks are those that have been formed, in long distant ages, from compressed sediment, usually deposited in the water of some ancient sea. With the aid of a magnifier, these rocks can usually be seen to consist of small granules, more or less firmly cemented together. Only the stronger ones will survive as pebbles; the commonest one of this type, chalk, being too soft, although there are vast masses of chalk cliffs around many parts of our coasts. Chalk, chemically calcium carbonate, consists mainly of the microscopic shells of former sea creatures.

Sandstone is another sedimentary rock that quite often forms pebbles. These may be quite hard but examination will show the granular structure.

Igneous rocks are those that have been formed under great heat inside the earth and forced to the surface, as in a volcano.

At one time there were many volcanos in this country and the lava they erupted has been left to form a large number of our mountains. Solidified lava, called Basalt, is very hard and usually forms irregular fragments rather than pebbles. The famous Fingal's Cave, in the Hebrides, is a fine example of masses of basalt. Pumice stone is lava which cooled when containing a froth of steam and gas, and pebbles of this may sometimes be picked up. They are characteristically light in weight.

In addition to the lavas, some molten rocks cooled slowly and were able to crystallise. The most familiar of these is granite, which must be well known in its polished state to most people, and forms huge cliffs along the coasts of Cornwall and parts of Wales. Granite pebbles are quite easy to recognise since the crystals can be seen easily. If the collector is fortunate enough to be on holiday on the Cornish coast he will be able to examine the rock itself in its rough state. Granite in general consists of three different materials. There is the glass-like quartz, and large whitish crystals of 'felspar', together with small glistening crystals of mica. Since these materials can exist in different coloured forms, granite specimens may show quite an interesting variety. Although very hard, granite fragments are eventually reduced to pebbles which are quite common on beaches, even where there are no granite cliffs, since they are carried along the coast by the tides and waves.

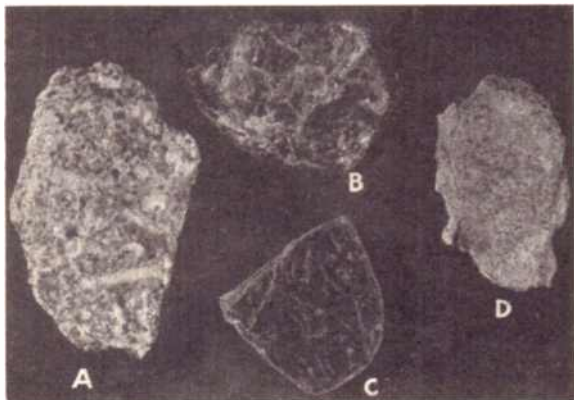
Metamorphic rocks are those that have undergone change, usually due to great heat or pressure. The three commonest ones are gneiss (pronounced

'nice'), schist and marble. Gneiss is a sparkling rock and is characterised by bands or streaks, which makes the attractive pebbles of this material fairly easy to recognise. Schist is of a flaky nature and usually consists of a mixture of mica and quartz. The well-known marble is derived from chalk, and the rounded, well polished pebbles of this may be tested by a little dilute acid, when they will effervesce or 'bubble'.

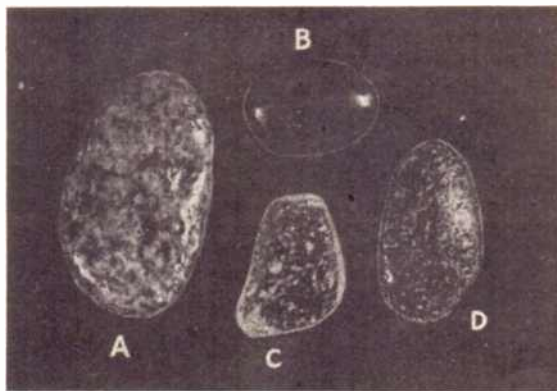
Again, visitors to the Cornish coast will discover with the granite, rocks of a beautiful material called 'Serpentine', from its streaky nature. It is usually of a greenish or reddish hue, and most attractively marked. Local industry makes use of it for the manufacture of ornaments since it is quite soft and easily worked. Serpentine (pebbles can sometimes be found on beaches farther East) is an igneous rock, partly metamorphic.

In addition to the pebbles of commoner rocks, those of semi-precious stones may occasionally be found by the observant collector. These are mostly varieties of coloured quartz, a form of silica, and also to be found in Cornwall. Examples are Amethyst, Agate, and Onyx. The beauty of these and other more common stones is often obscured by surface scratches and roughness, and to exhibit it to the full, they must be ground and polished. Although the collector can do this for himself by means of carborundum powder and a glass plate, finishing with finer polishing powder, it is a laborious process. The work is usually carried out by a professional lapidary.

Softer pebbles can easily be filed down and polished with metal polish.



Rock specimens: (a) Cornish granite; (b) A piece of serpentine from Cornwall; (c) Polished serpentine; (d) A portion of sandstone rock.



Pebble samples: (a) Large granite pebble from Dungeness; (b) Flint pebble; (c) Granite pebble with surface polished; (d) A crystalline pebble of the granite type.

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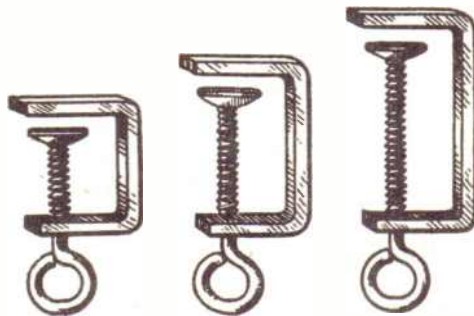
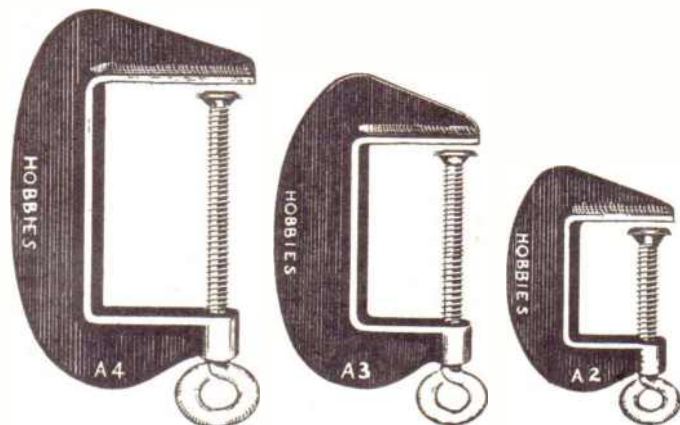
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The 'Accidents' set was popular among collectors. Designs included:

1. Housewife shielding her face as benzine splashes from a bottle. Yellow/red/black on white.
2. Housewife recoiling from electric shock due to defective flex. Red/green/yellow/black on white.
3. Workman falls from a table and two boxes upon which he has been standing to paint a wall. Blue/red/brown/black on white.
4. Man in blue suit and cap gazes woefully at his right foot after he has trodden on a nail. His slipper is nearby. Blue/red/brown/black on white.
5. Trees and shrubs standing gaunt and leafless against a red sky. A lighted match being the cause. Red/black on white.

The Belgian Company of General Insurance have a glazed cover portraying a gentleman in period dress holding a quill pen and paper. A red frame neatly encircles him against a black background.

Three glazed covers issued for Beliard, Crighton & Co., Antwerp-Ostend, make a worthwhile set. Although non-pictorial, the covers have an attractive gold monogram incorporating the firms' initials. On reverse side the colours are varied, i.e. cream, yellow and white.

Brussels, the capital of Belgium, is sometimes called 'Little Paris', because it is so bright and gay. Antwerp is the chief centre of commerce. It has a beautiful cathedral, and some wonderful pictures by Rubens; one of which, 'The Descent from the Cross', is world famous. Bruges is famous for its fine linens, damask and lace.

Ghent may be termed the Manchester of Belgium. Cotton is the chief manu-

facture of this great city which at one time was larger than Paris. Liege, the Birmingham of Belgium, is a great centre for the manufacture of fire-arms.

'1929. Express Letter Stamps. 1f. 75c. blue — Town Hall, Brussels — 4d. used. 2f. 35c. red — Ghent — 6d. used. 3f. 50c. purple — Bishop's Palace, Liege — 2/6 used.'

BELGIUM—By R.L.C.

The colours of the Belgian tricolour are those used in the Brabancon revolt against Austria in 1787. They are taken from the arms of Brabant, the golden lion with its red tongue and claws on a black ground. In 1830, when the alliance with the Netherlands was severed, the colours of the Brabancon revolt appeared again, and these were adopted as the



national flag of Belgium. The one flag is used as a national flag, as a naval ensign, and as a merchant flag.

In the Arms the lion of Brabant is the central figure; the supporters are sometimes shown holding the national flag on lances.

'1944. 1f. 75c. blue — 'Genevieve of Brabant with the Child and the Hind', Brabant. — 9d. mint. 1945. 5c. brown — Lion Rampant — 2d. mint. 1947. 65c. blue — Duke of Brabant — 9d. mint. 1950. 80c. green — Arms of Great Britain and Belgium — 4d. used.'

Belgium has the heaviest population in relation to its size of any country in Europe, and, for the most part, is flat. There are hilly districts in the south-east, but no height is worthy of being called a mountain.

There are two large rivers. The Meuse, rising in France, passes through Belgium into Holland, where the Dutchmen rechristen it the Maas. It then falls into the German Ocean, on the west coast of Holland. It is 522 miles long. Namur and Liege are the chief Belgian towns on its banks.

The Scheldt also rises in France, and, after flowing through Belgium, finds its way into the German Ocean, in Dutch territory. Ghent and Antwerp are on its banks.

There are several smaller rivers which are tributaries of the two larger ones named above. These include the Sambre, Ourthe, Lys, Dender, Rupel, and Senne upon which Brussels is built.



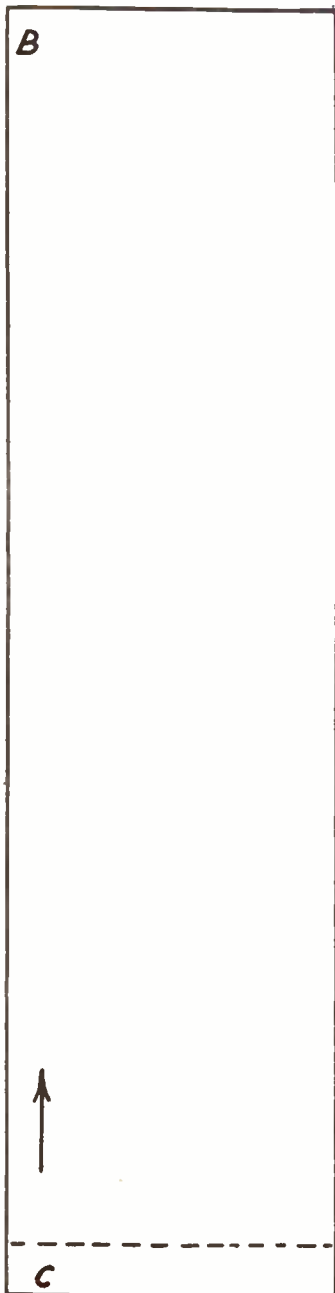
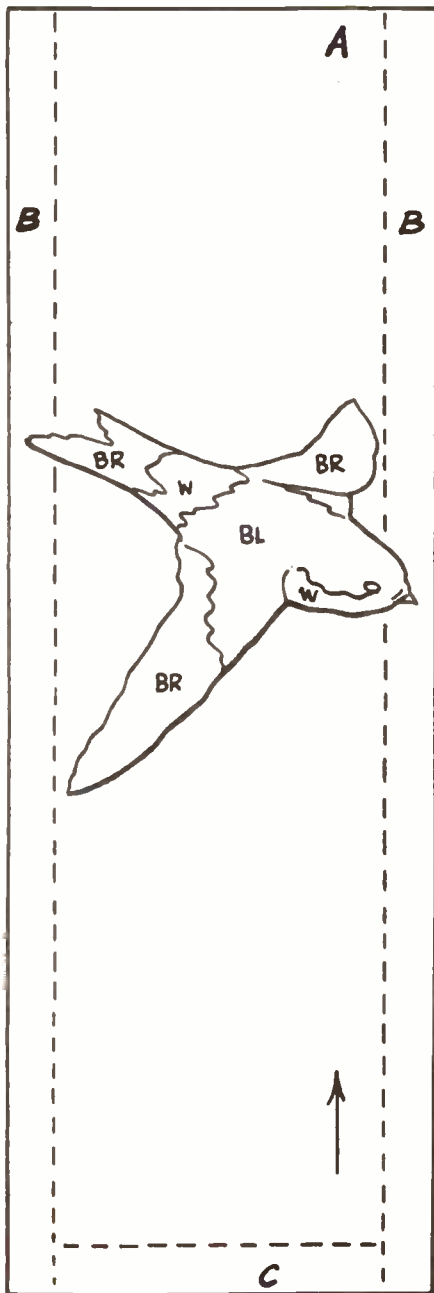
'1915. 1f. violet — Freeing of the Scheldt — 4d. used. 1943. 10f. brown — Meuse Landscape — 3/6 mint. 1948. 2f. 50c. purple — Antwerp Docks — 2d. used.'

One fifth part of the country is woodland. It lies chiefly in the valley of the Meuse and the Ardennes. The trees are mostly oak and furnish charcoal and large quantities of bark for tanning purposes.

Minerals are plentiful. Iron, lead, copper, zinc and alum are produced in large quantities.

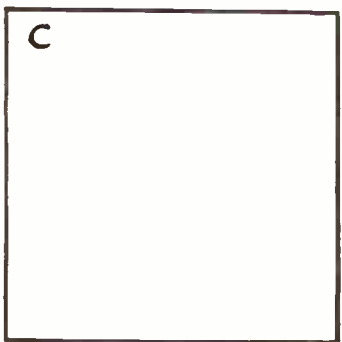
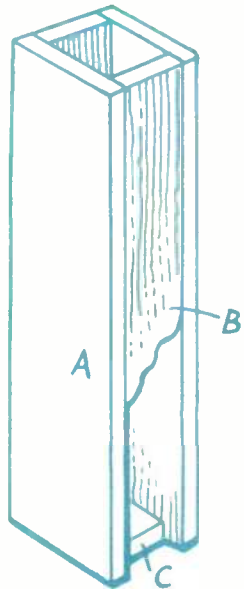
'1948. National Industries. Set of 12, 3/4 used.'

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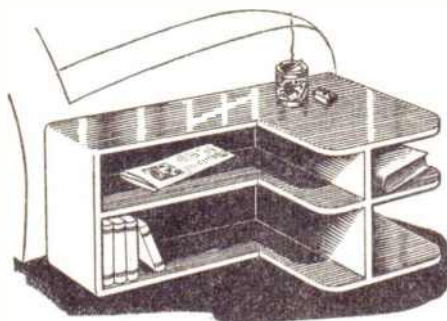
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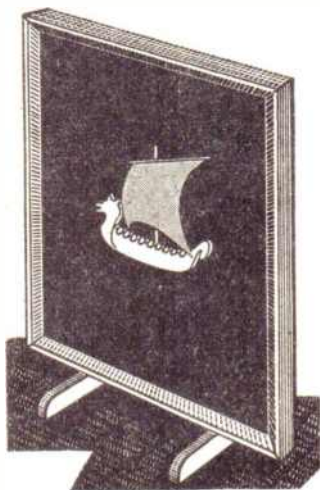
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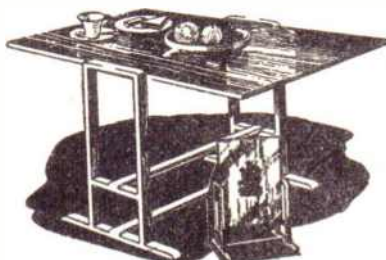
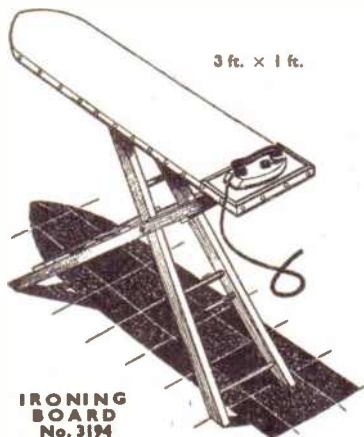


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