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THE ORIGINAL
'DO-IT-YOURSELF'
MAGAZINE

HOBBIES *weekly*

FOR ALL
HOME CRAFTSMEN

**Instructions
for making . . .**

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HOW TO MAKE A
TEST METER

COLLECTORS' CLUB

PLANS FOR MODEL
'GRANDPA' CLOCK

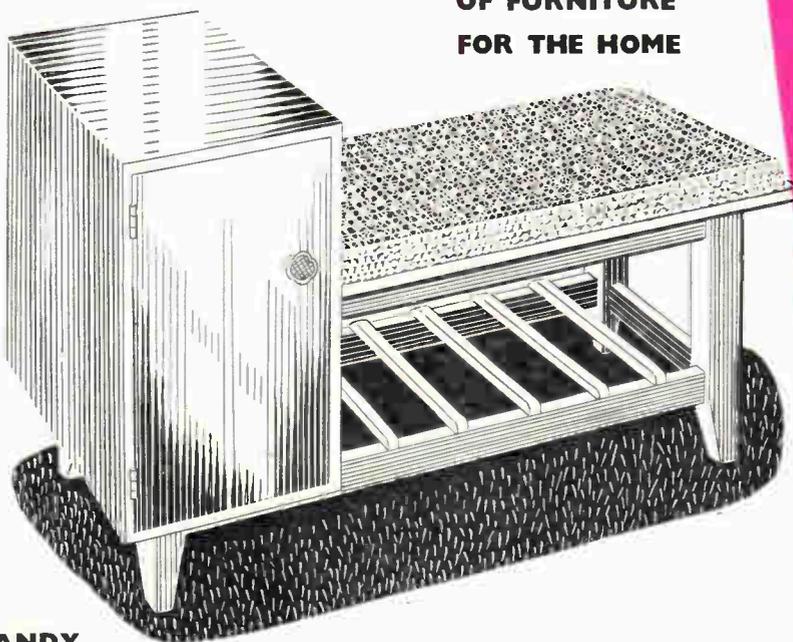
HINTS FOR HOT
WEATHER CYCLING

DISPENSER TO HOLD
GARDEN LABELS

REPLIES TO READERS

ETC. ETC.

**ATTRACTIVE PIECE
OF FURNITURE
FOR THE HOME**



**WITH A HANDY
CABINET**

HALL SEAT

Up-to-the-minute ideas

Practical designs

Pleasant and profitable things to make

World Radio History



5^D



A NEW series of stamps for the Trucial States, to replace the specially overprinted British stamps used at British Postal Agency, Dubai, were issued on 7th January.

The new series consists of eleven denominations. There are two designs, one of a dhow for the four stamps with values in rupees, and one of palm trees for the seven stamps with values in naye paise. The designers were respectively Mr M. C. Farrar-Bell and Mr M. Goaman.

NEW STAMPS FOR TRUCIAL STATES

This series is the second of the new issues of stamps which, as announced in November 1958, are to be introduced in the British Postal Agencies. The first of the new issues, that for Bahrain, has been on sale since 1st July 1960.

By agreement with the local rulers, the British Post Office provides postal services by means of agency offices in the following territories: Bahrain, Qatar, Trucial States, and the Sultanate of Muscat and Oman.

The Agencies were originally operated by the British Indian Post Office, which used overprinted Indian stamps. In 1948, when the Agencies were taken over by the British Post Office, British stamps overprinted to indicate the local value and, in some cases, the name of the State, were introduced. These overprints are gradually being superseded. They were withdrawn from sale in Bahrain on 30th June 1960, and in the

Trucial States on 5th January 1961, but will continue to be used in Qatar and in the Sultanate of Muscat and Oman for the time being.

The two designs for the new stamps were chosen by the Rulers of the Trucial States.

The denominations and colours of the new stamps for the Trucial States are as follows: 5 naye paise, green; 15, brown; 20, blue; 30, orange; 40, violet; 50, amber; 75, grey. 1 rupee, green; 2 rupees, black; 5, red; 10, blue.

An air-letter form bearing a surface printed 30 naye paise stamp in red on paper similar in texture and colour to that used for British air-letter forms has also been issued.

Mr Michael Goaman, the designer of the low value stamps, was born in 1921. He studied at Reading University School of Art and the Central School of Arts and Crafts, and is a free-lance designer who specializes in postage stamps. He has previously designed one stamp for the United Kingdom (the 4d. Coronation stamp of 1953), and has also been successful with designs for stamps issued in a number of Commonwealth countries.

Mr M. C. Farrar-Bell, the designer of the high value stamps, is forty-eight, and an old Harrovian. He has also designed the low value stamps now on sale in Bahrain, and a number of stamps for the United Kingdom (the current 2½d., 3d., 4d., and 4½d. stamps, the 1s. 6d. Coronation stamp of 1953, and the 6d. stamp as printed on air-letter forms from 1953 to 1957).

Besides being a typographic designer, Mr Farrar-Bell is a well-known designer of stained glass, his principal works being the Great West Window in

Exeter Cathedral, the Great East Window in Bath Abbey, all windows in the Mariners' Chapel of the Toc H Church, All Hallows-by-the-Tower, and, in Canada, eight windows in H.M.'s Chapel Royal of the Mohawks.

The stamps with values in naye paise were produced by the photogravure process in sheets of 100 by Messrs. Harrison and Sons Ltd, and those with values in rupees by the line engraving process in sheets of fifty by Messrs. Thomas De La Rue and Co. Ltd.

Both values are printed on unwater-marked paper.

British stamps and air-letter forms overprinted with a value in local currency were withdrawn from sale at Dubai on 5th January, but they will continue to be valid for use there until further notice.



ROY HARRIS of 127 Mill Road, Deal, Kent, is a keen stamp and label collector. He would like pen friends throughout the world.

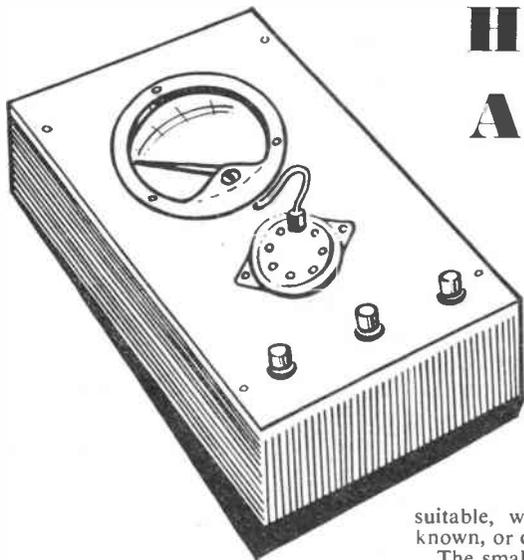


Reader Murray Scott of New Zealand, with his wife, Carolyn, and Suzanne

'I have decided to collect coins of the British Isles, and will be glad to send stamps, labels, and coins from New Zealand in exchange', writes MURRAY SCOTT, 36 MacDonald Street, Timaru, South Canterbury, New Zealand.



HOW TO MAKE A TEST METER



By
'Radio Mech'

THE usual type of radio test meter has several voltage and current ranges. It actually consists of a milliammeter, with a number of resistors, the latter being chosen to provide the various ranges wanted. It is thus very easy to construct a multi-range test meter making use of a 1mA or similar milliammeter.

Milliammeters are available new or as surplus, in many sizes and types. The size is the approximate diameter of the case. For many purposes, a 2 in. or similar instrument will do well. Larger instruments have larger scales and dials, but cost more. The milliammeter may be flush mounting, to fit a hole the same size as its case. Or it may be projection mounting, to rest on the panel.

Though a 1mA meter (that is, one giving a full-scale reading with 1 milli-amp) is convenient, other types can be used. Various surplus instruments contain milliammeters, and these may be

suitable, when the current reading is known, or can be found.

The smaller the current taken by the meter, the more sensitive it is. This is of almost no importance when the meter will be used to check batteries, and other power supply voltages. But when it will be used for tests inside an amplifier or radio, it should be quite sensitive. For battery and similar tests, a 5mA or 10mA meter will do. But for circuit tests, a 1mA instrument will be better. If the meter is even more sensitive, this may be better, in some cases.

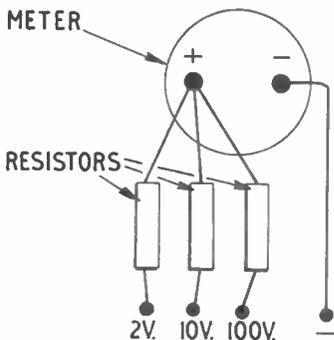


Fig. 1—Voltmeter circuit

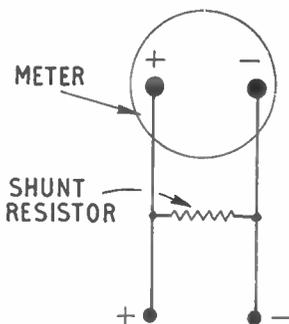


Fig. 2—Shunt used to read higher current

For internal tests, the current drawn by the meter may upset working conditions, and this is the reason why a sensitive instrument (that is, one drawing less current) is preferable. But for many ordinary tests, this will be of no importance, and it is then possible to use almost any milliammeter.

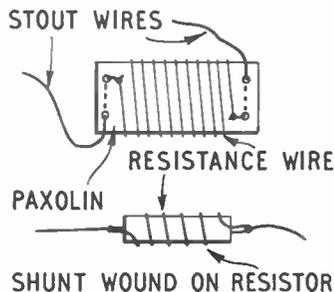
Voltage and current

To read volts, with the milliammeter, a resistor is wired in series with it. If the full-scale voltage reading required is divided by the full-scale current of the

milliammeter, this gives the resistance value, in ohms. Current is expressed in fractions of an ampere, and 1,000mA equal 1 ampere.

Suppose a 3-range meter is wanted, to test all-dry battery portable supplies, and for similar purposes. Ranges of 0-2V., 0-10V. and 0-100 V. would be suitable. With a 1mA instrument, the following resistors would be wanted:

- 2,000 ohm (2K) for 0-2V.
- 10,000 ohm (10K) for 0-10V.
- 100,000 ohm (100K) for 0-100V.



[Fig. 3—How the shunts can be wound

The resistors can be connected as in Fig. 1. One lead from the test prods is taken to negative. The other is taken to the 2V., 10V., or 100V. terminal, according to the range needed. A socket strip would be handy for changing voltages.

For small mains sets, somewhat higher ranges would be wanted. With the 1mA milliammeter, four resistors could be used, as follows:

- 5,000 ohms (5K) for 0-5V.
- 25,000 ohms (25K) for 0-25V.
- 100,000 ohms (100K) for 0-100V.
- 250,000 ohms (250K) for 0-250V.

To save working out values for each range, it is convenient to work out the value for 1 volt. With the 1mA meter, this is 1,000 ohms. This is the same as saying the multi-range meter will be '1,000 ohms per Volt.' There will thus be 2,000 ohms for 0-2V., 5,000 ohms for 0-5V., 10,000 ohms for 0-10V. and so on.

A 5mA milliammeter will provide 200 ohms per volt. That is, the resistors should be 400 ohms for 0-2V., 1,000 ohms for 0-5V., and so on. A 10mA meter would be 100 ohms per volt.

It is thus easy to provide any voltage ranges wanted. Most meters have scales marked 0-5 or 0-10, so it is easiest to choose ranges which fit in with this.

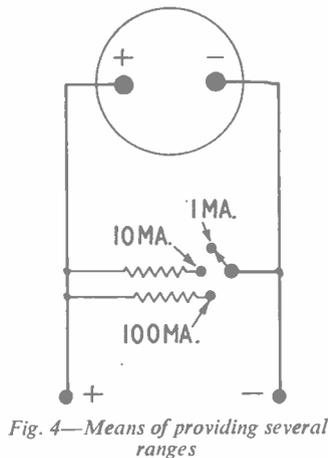
Readings are uniform over all the scales. That is, once the correct resistor

has been connected for the proper full-scale reading, all the lower readings on that range will be correct also.

Accuracy

If the resistors are not exactly the values marked on them, readings will be slightly in error. Ordinary radio resistors are not very accurate. For this reason, it is usual to fit resistors accurate to 1 per cent, in meter circuits. These cost a few pence more than ordinary resistors, but assure that readings are exact enough for all practical purposes.

The meter coil winding is in series with the resistor. A typical 1mA millimeter might have an internal resistance of 100 ohms. With high voltage ranges, the error caused by this is so extremely small that it is always ignored. But with low voltage ranges, the extra resistance should be taken from the figure already found. For example, with the 1mA meter, 2,000 ohms were required to read 0-2V. If the meter is itself 100 ohms, this is taken from 2,000. The result is 1,900 ohms, so the actual series resistor would be of this value.



Many millimeters have a resistance of only a few ohms, and it is quite usual to ignore this. Even good quality multi-range test meters seldom try to achieve an accuracy over 1 per cent or 2 per cent, so such slight errors are unimportant.

Higher currents

The millimeter, as it stands, provides one current reading. To read higher currents, a shunt resistor is wired across the meter, as in Fig. 2.

The value of this shunt may be calculated, or found by trial. If calculated, its value in ohms is as follows:

$$\frac{\text{Meter Resistance}}{(\text{Scale Multiple} - 1)}$$

For example, suppose a 1mA millimeter, with 100 ohms internal resistance,

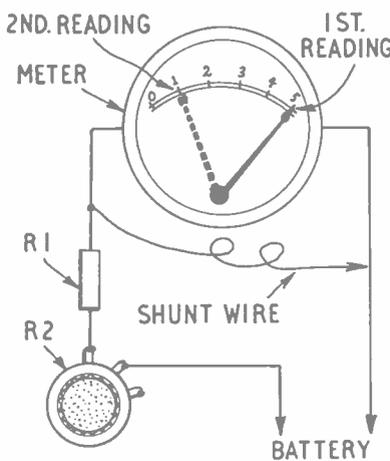


Fig. 5—Making shunts by trial

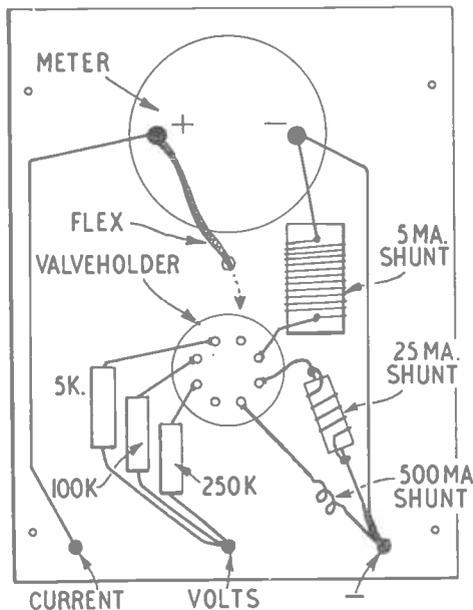


Fig. 6—Complete 7-range meter

is to read 0-10mA. The scale multiple is 10 (that is, it will read up to 10mA, instead of up to 1mA). So $10 - 1 = 9$. And 100 divided by 9 is approximately 11.1. So an 11.1 ohm shunt would be used.

Shunts are usually wound with resistance wire. Resistance wire has a certain resistance, per inch or foot. For example, 38 s.w.g. Eureka resistance wire is 1.5 in.

per 1 ohm. So for 11.1 ohms, the total length of wire wanted will be 1.5×11.1 , or 16.65 in. This length would thus be cut, and used as a shunt. The 1mA meter would then read 0-10mA. Scale readings are uniform throughout, as explained for voltages.

The resistance wire can be wound on a strip of ebonite, paxolin, or other insulating material, as in Fig. 3. When strong resistance wire is used, its wire ends can go directly to the circuit. But if the wire is thin, fit stout connecting wires, as in Fig. 3, and solder the resistance wire to these leads.

Some shunts may be of very low resistance indeed. It is then in order to wind the few inches of wire on a surplus resistor, as also shown in Fig. 3. This resistor should be of several thousand ohms value. It has no practical effect on the shunt value, and merely acts as a support for the resistance wire.

For very high current ranges, an extremely short piece of resistance wire will be wanted, and this can be self-supporting, or can be wound into a spiral. The shunt value can become so small, that ordinary 20 s.w.g. copper wire will have enough resistance.

To provide several current ranges, shunts can be brought in as shown in Fig. 4. Here, a 3-way switch is indicated. At the 1mA setting, the 1mA millimeter alone is in circuit. With the switch set for 10mA, the 10mA shunt is across the meter. The remaining switch position brings in the 100mA shunt, for the 0-100mA range. Any desired ranges can, of course, be provided.

Shunts by trial

If the resistance of the meter is unknown, and wire of unknown resistance is to hand, shunts can be made up by trial. One means of doing this is shown in Fig. 5.

R1 is merely to prevent too much current passing through the meter, if variable resistor R2 is carelessly adjusted. The shunt wire is removed, and R2 and the battery voltage are adjusted until the meter indicates full-scale. For example, with a 9V. battery, the resistance value would be nearly 2,000 ohms, for a 5mA millimeter. Any components for R1 and R2, which allow around 2,000 ohms to be in circuit, would thus do. It is best to use a reasonably high battery voltage — say not under $4\frac{1}{2}$ V.

With the battery disconnected, see that the meter reads zero. If not, carefully adjust its zero until this is so. Set R2 at high value, and connect the battery. Then turn the knob on R2 until the meter reads exactly full scale. This is the '1st reading' in Fig. 5.

If the meter scale reading is to be multiplied by 5, take a piece of resistance wire, and connect it across the meter.

Adjust this wire until the correct length is found for the pointer to give the '2nd reading'. That is, it now reads 1mA instead of 5mA.

This length of resistance wire is then wound as in Fig. 3, and is a 25mA shunt. That is, the full-scale reading of the meter will now be 25mA.

R1 and R2, and the battery voltage, may now be adjusted until the meter again reads full scale. This is 25mA. A further shunt can then be made to reduce the reading by any desired extent, and thus form a shunt for a third, higher range. In this way, several shunts may be prepared.

If possible, the higher current ranges can be checked by connecting a battery and valve or other item which passes a known current. Various .05 amp (50mA) and .1 amp (100mA) battery valves, with

their correct filament battery voltage, will be handy for this purpose. Such a check will make sure that an error is not made in the shunts.

Complete meter

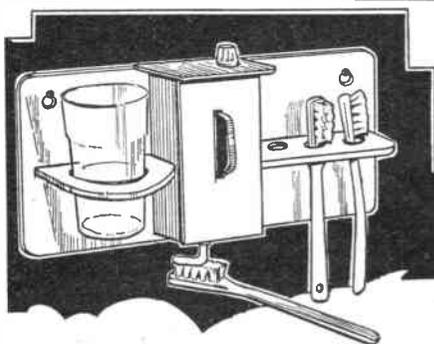
Fig. 6 shows wiring and components for a meter with 0-5V., 0-100V., and 0-250V. ranges, and 1mA, 5mA, 25mA, and 500mA ($\frac{1}{2}$ amp) ranges. It is intended for a 1mA milliammeter. Other meters could be used, values being obtained as already explained.

A flexible lead passes through the panel, and is equipped with a small plug. This can be inserted into any of the valveholder sockets, so that the various resistors or shunts can be brought into circuits. For the 1mA range, the plug occupies an unconnected socket.

All wiring can be at the back of the panel, which can be cut from thin Paxolin. The completed instrument will then fit in a shallow box, and can be secured with four small screws.

Good quality flex should be used for the test leads. The negative connection is permanently made, but the positive lead is taken to the 'Current' or 'Volts' terminal, according to whether current or voltage is to be read.

Shunts should be well made, and soldered into circuit, as any change in resistance due to poor contact will upset readings. Take care never to pass excessive current through the meter, by trying to measure too high a current or voltage. If the figure likely to be encountered is not known, begin with the highest current or voltage range, and transfer to a lower one, if necessary.



THIS bathroom fitment features a compact toothpaste dispenser, built in with a rack for housing tooth brushes and a tumbler.

Fig. 1 gives front view and top view of the rack with measurements of parts. Fig. 2 shows a detail of one of the side pieces for the dispenser cabinet as well as four further pieces which are required for the squeezer mechanism and front of the rack.

Cut pieces A (back), D (box sides), E (top and bottom pieces) G (sloping back piece) and J (pressure pad) with a fretsaw from $\frac{3}{8}$ in. wood. The toothbrush and tumbler racks (B and C) and the handle K are of $\frac{1}{4}$ in. plywood. A piece of thin wood is needed for piece F and a piece of non-rust metal such as aluminium, X, for the underside of the dispenser.

Check measurements against each part before cutting out. Clean up with glass-paper and assemble. See that tenons fit tightly into mortices. Hold parts together with waterproof glue. Small panel pins give extra support. Check the diameter of your brand of toothpaste before drilling holes in one of E and in the metal plate X.

As Fig. 1 shows, the tube is inverted, with the neck protruding through the bottom plate. Piece H has strips of wood that grip against the sides of the cabinet but they are removable for access to the tube S.

Make up the pressure pad and handle J and K. With the tube inserted, hold the pressure pad against it and put the front cover in position with the handle protruding through the slot. The slot

should be cut long enough for the handle to be pushed through at varying angles against the slope of the tube. The cap may be replaced on the tube to prevent the paste drying up.

Holes for inserting the brushes may be round, or slots wide enough to take the handles. The diameter of the hole for the drinking vessel may have to be altered to suit the size of glass or plastic beaker to be used.

Paint the rack white and the pressure handle black or other colour, using plastic enamel for a hard-wearing gloss finish. Mount the finished article on the bathroom wall near the sink by means of the two holes in the back piece which fit over nails or screws inserted in the wall.

(T.S.R.)

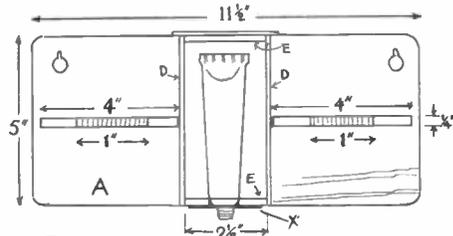


Fig. 1

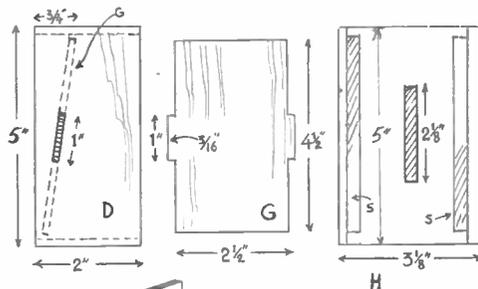
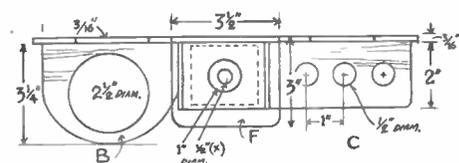
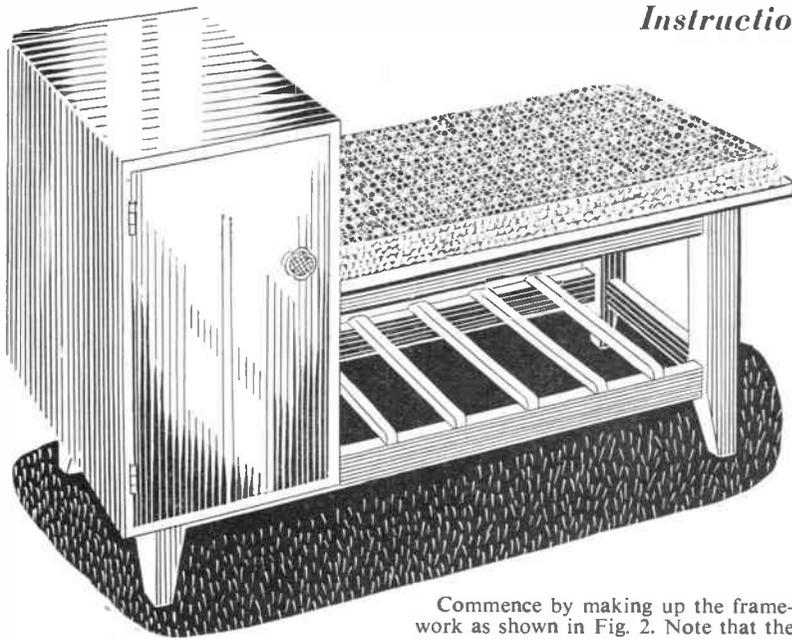


Fig. 2

A SEAT FOR THE HALL



THIS fitment makes a useful and attractive addition to the hall. It could also be used in the bedroom or lounge. The door could be omitted and the cabinet used as a bookcase with suitable adjustment of the shelves. The cabinet serves as an ideal resting place for a telephone, and there is plenty of room inside for directories.

The diagrams in Fig. 1 show the front and side views, with sufficient measurements for making up. The cabinet and seat L are cut from $\frac{1}{2}$ in. wood, and the legs D and E from 2 in. square wood. The rails are 2 in. by 1 in., and are mortised into the legs.

Commence by making up the framework as shown in Fig. 2. Note that the legs are tapered on the inside to 1 in. This gives a nice shape to the legs, which greatly enhances the appearance. The rails C are tenoned at the cabinet end to fit into pieces F. Rails A, B, and C are all tenoned and mitred into the legs, as indicated in Fig. 3. These joints will be cut in the usual way with a tenon saw for the tenons, and by boring and clearing out will ensure accurate joints. All joints will be glued and cramped up where possible.

The cabinet is 24 in. high, 15 in. wide, and 15 in. deep, and is constructed as shown in Fig. 4. The sides, top, and bottom are each made up of two pieces

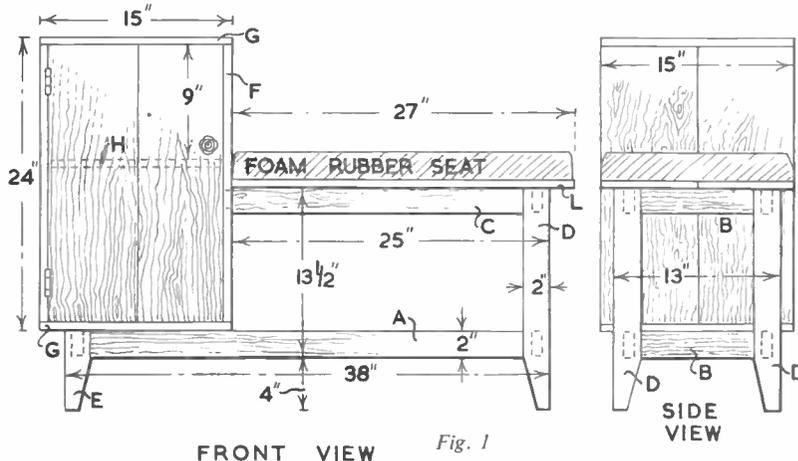
glued and butted together. The pieces should be securely cramped while the glue is drying.

The back and shelf can be cut from $\frac{1}{2}$ in. plywood, and the strengthening pieces I from 1 in. square stripwood. In Fig. 4 the side F is broken away to show how piece I goes right through to the back. All pieces are fixed by means of panel pins in the appropriate positions.

Fit the cabinet in position on the framework, and secure with pins and glue. Wipe off excess glue before it has time to dry. The seat L is constructed from two pieces of $\frac{1}{2}$ in. wood, glued and pinned to the top rails C.

The door is battened as in Fig. 5, the battens K being 1 in. by $\frac{3}{4}$ in. stripwood. Taper them off at each end as shown. Use 2 in. heavy brass butt hinges, and recess them as detailed in Figs. 4 and 5.

Fit a knob such as Hobbies No. 712b, which costs 1s. 9d., postage 6d., from Hobbies Ltd, Dereham, Norfolk. If a catch is required, No. 5480 $\frac{1}{4}$ in. ball



CONSULT THE DIAGRAMS ON OPPOSITE PAGE

catch, price 5d., postage 3d., will be suitable. The slats across the bottom rails A are $\frac{1}{2}$ in. square stripwood, and should be pinned and glued in place.

Clean up all pieces with glasspaper, fill the grain with woodfiller, and sand down ready for polishing or varnishing. Apply polish or varnish in dust-free conditions.

Finish off by making the cushion to fit the seat. Use foam rubber or any other suitable material, covering to match your furnishing scheme. (M.h.)

DIAGRAMS
FOR
MAKING
THE
HALL
SEAT

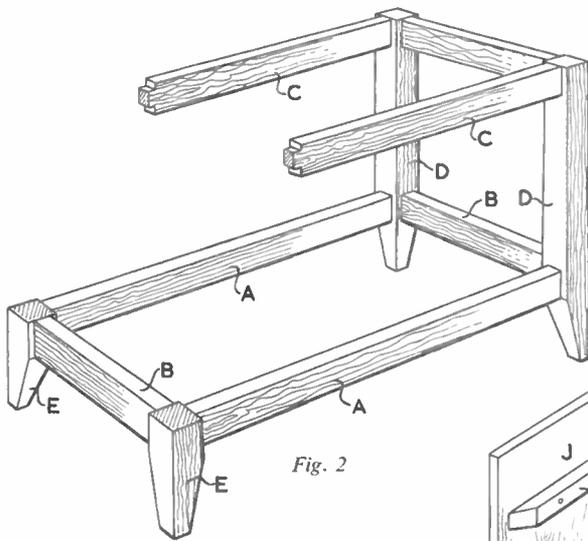


Fig. 2

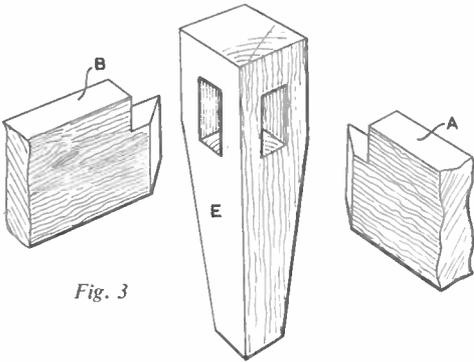


Fig. 3

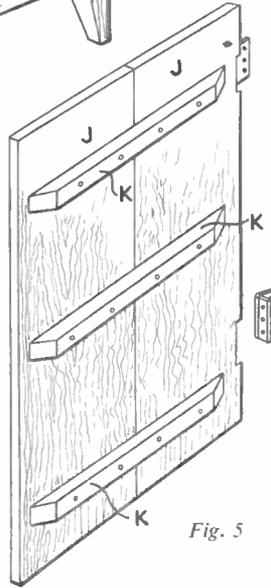


Fig. 5

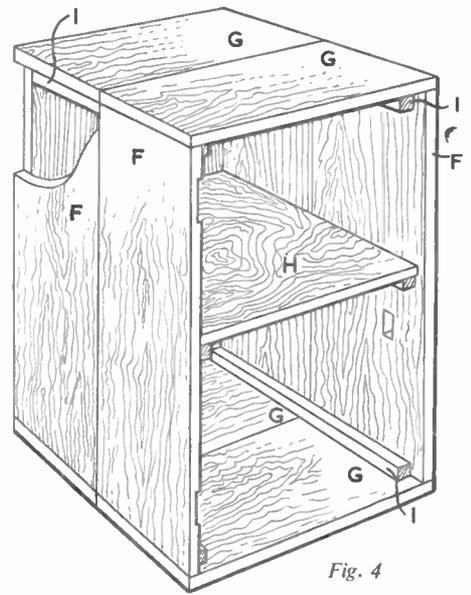


Fig. 4

A charming novelty 'Ye Olde Wishing Well' will be the subject of our free design next week. Incorporating a musical movement, it can be used as a trinket box. Make sure of your copy of 'Hobbies Weekly'.

TRICKY DESIGN



MR H. F. WOOD of Leytonstone, London, wanted a 'tricky design' to work on, and we printed his request in an issue of *Hobbies Weekly*. He writes to say that another reader, Mr E. W. Ripplingale of Dunmow, Essex, kindly provided him with a design for a very fine model of a locomotive and tender, which will involve many hours of work and patience — just what Mr Wood was looking for.

'If any of your readers require any design or any copy of *Hobbies* back numbers I will be only too pleased to help', writes Mr D. F. Price, 8 Ingleby Crescent, Ermine Estate, Lincoln. This very generous offer comes from a sick man whose greatest delight, nevertheless, is to look through his collection of *Hobbies* plans, and pick out something to make. He then derives much pleasure in giving the article away.

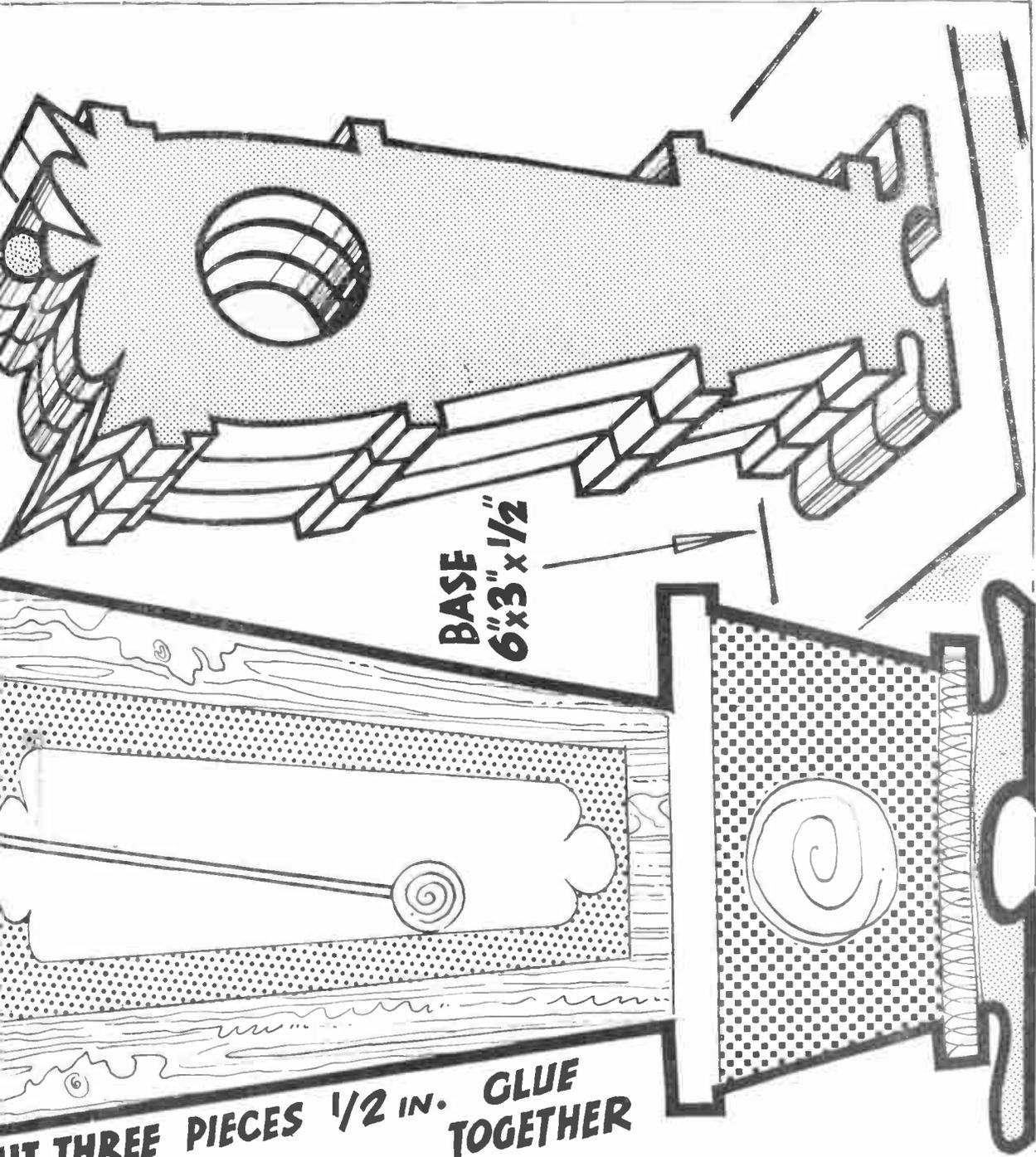
A GYANT miniature 'GRANDPA'

* CLOCK *

DETAIL PAINTED ON

HOLE TO TAKE
HOBBIES CLOCK
No. 5516

CUT THIS



**BASE
6" x 3" x 1/2"**

**GLUE
TOGETHER
THREE PIECES 1/2 IN.**

• PRINTED IN ENGLAND •

...ab evenly on the paper... to know if you could... wish to make some plan... mitter? (R.P.—Wolverhampton.)
 ...ght and hang to dry under... to go over the wallpap... on the same... Channel 10 would

Replies to Readers

... (red)... is a brush politt... to charge a 12V. battery, as... was made by jsting... lboard over a stou... and 15V... more.)

Care of Cane Rods

I HAVE recently purchased a set of chimney sweep's rods and brush; could you kindly advise me as to the correct method of maintaining them? They are of fairly stout cane, and I would like to make them a bit more pliable. Is it possible to do this by soaking in water? (C.A.F.—Tooting.)

ORDINARY cane chimney rods are best kept hung up in a cool place, not too damp, but not in a drying atmosphere. The canes cannot be made permanently more pliable, but can be softened somewhat immediately before use by soaking in very hot water or by holding in a jet of hot steam. Incidentally, while hot and damp they can be straightened (if necessary) by bending between the hands and then at once immersing in cold water to set them. A regular rubbing with linseed oil is a good preservative and helps to keep them supple.

Use for Old Speaker

I HAVE a fine old radio of a small size. Some of the parts which are worn out are not now obtainable, and I would like to use it as an extension from my present set. Could you tell me briefly what parts to use in the construction of this extension, and how to connect it, running the wires from one room to another? (W.C.T.—Dundee.)

THE speaker could be used for extension purposes, provided it is a permanent magnet type. Assuming that you have the usual extension sockets on the other receiver, take two leads from these to the speech-coil tags of the speaker in the disused receiver. If no such sockets are available, then take the leads from the speech-coil tags of the speaker in the operating receiver instead.

Fun with Chemistry

by Mae & Ira Freeman

THIS absorbing book, with its 'homely' and therefore interesting experiments, gives the answer to many puzzling and fascinating chemistry problems — how to write with invisible ink, how plants make starch and sugar, how to release carbon from sugar, etc. All the experiments are quite safe, and can be done at home, using household materials and a few test tubes. The large photographs make the subject matter and each test very easy to follow. Anyone starting with this book will find themselves seeking further knowledge of this vast and interesting subject.
 Published by Edmund Ward, 194 Bishopsgate, London, E.C.2 — Price 11/6.

Making Aero Dope

COULD you please tell me if there is any way of making my own aero-plane dope, and also tell me how to colour clear dope? (S.W.—Chichester.)

THE easiest way of making aero-plane dope is to thin down cellulose cement — such as 'Durofix' — with a mixture of equal volumes of amyl acetate and acetone. This gives a clear dope. To colour it, certain dyes (giving a transparent dope) or pigments (giving an opaque dope) are used. Any of the standard pigments from an oil and colour shop can be mixed in to form opaque dopes. For transparent dopes, powder the dye and dissolve a few specks at a time by stirring into the dope, until the required depth of shade is reached. The dyes are: for pink, Rhodamine; red, Safranin; blue, Methylene Blue; violet, Methyl Violet; green, Malachite Green; yellow, Auramine; black, alcohol-soluble Nigrosine; orange, Chrysoidine; brown, Bismarck Brown. These dyes can be had from George T. Gurr Ltd, 136/138 New Kings Road, London, S.W.6.

kept hot by dipping in hot water. Rub out surplus glue. Have ready a piece of wood, well heated; place paper over cut and lay wood on top, weighting the lot down with a heavy box, or cramp up if feasible. Next day clean off the paper, make good any defects with coloured stopping, and repolish.

Grinding a Glass Stopper

I HAVE an old glass decanter, but the stopper does not fit as it is slightly on the large side; can you tell me how to reduce it slightly in diameter? (T.D.C.—Dundee.)

THE only feasible way of reducing the diameter of the stopper is by grinding. If a lathe is available, the stopper can be held in a chuck, and the grinding accomplished by applying a coarse carborundum stone to the conical surface, whilst keeping the whole well lubricated with water. In the absence of a lathe, the best plan is to make a conical hole in a piece of wood, and to use coarse carborundum grinding powder and water, and rotate the stopper in the conical hole until sufficient has been ground away to suit your purpose.

Wood Dye with Matt Finish

CAN you recommend a good method, stain or chemicals, for a simple wood dye with a matt finish? I want dyes of yellow, blue, red, green, etc, such as seen on wooden toys in the shops. (P.D.—Chorlton.)

PACKET dyes, such as Drummer, are very effective wood stains. Choose the brightest of the yellows, blues, reds, and greens, for some slight darkening is produced by the natural colour of the wood. Dissolve the dyes in a pint of hot water, and apply to the wood with a brush. The wood is best lightly glasspapered before staining, so as to remove any slight grease film left by the hands. Penetration may be poor on some woods. In this case, place the wood in hot dye solutions until the required shade depth is reached. Allowance should be made for slight lightening on drying. Any slight white bloom can be rubbed off the dried wood with a dry cloth. Perfect matt finishes are obtained by these methods.

Hardening Plasticine Models

I HAVE made a Plasticine model for exhibition purposes, and wish to know how to harden this. (C.T.V.—York.)

AS there is no way of hardening Plasticine, we suggest you paint the model with two thin coats of white shellac polish. This is quite cheap and can be obtained from any paint shop. When the shellac is quite dry, give one or more coats of paint. This treatment gives a hard surface, and the model can then be handled with little fear of damage. For permanent models there is a self-hardening material called 'Plastone'

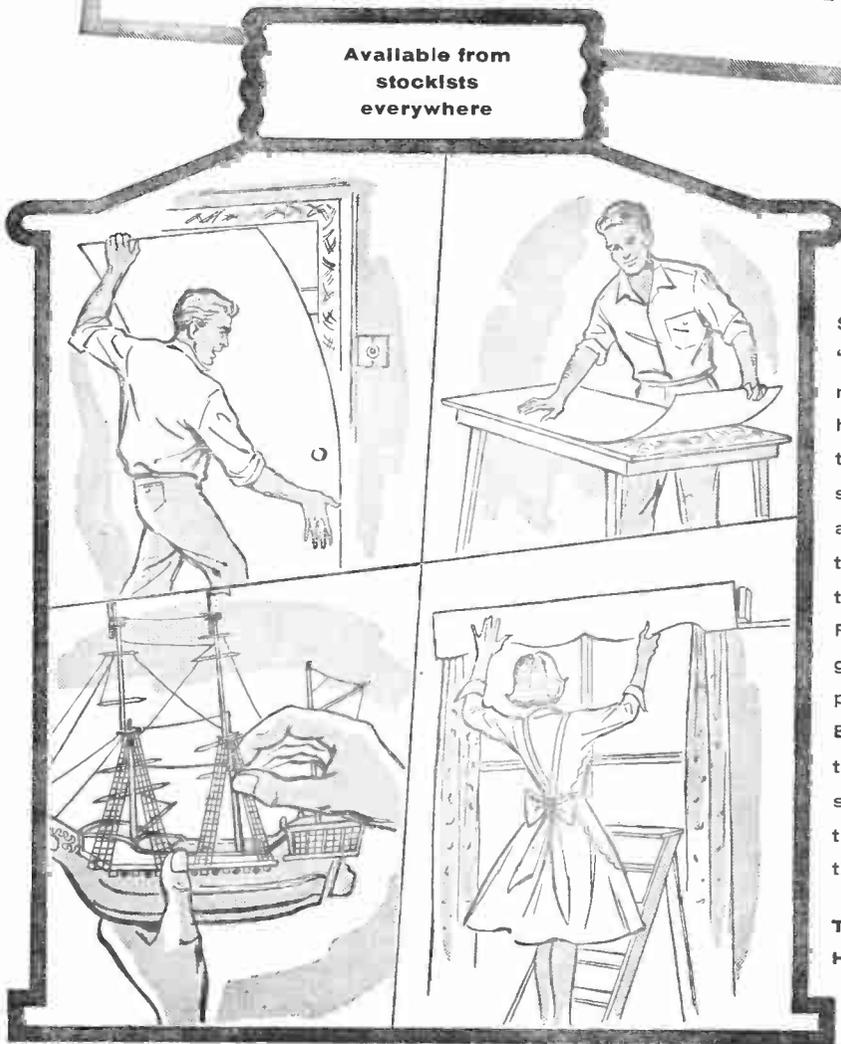
A Blistered Veneer

HOW can I remove blisters from the top of a sideboard caused by water from a leaky vase? (P.C.T.—Denham.)

THE blister should be cut across in such shape that it will not be noticeable when repolished, so as far as possible let the cut follow the line of grain. Hot thin glue should be worked under the cut veneer with a thin knife,

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CYCLING IN HOT WEATHER

THE bicycle has for long been a prominent feature of our daily life, and there are now 12,000,000 cyclists in Britain alone. The bicycle appears to be coming back again into the public eye through a variety of reasons. Leading authorities in the medical profession are urging its use as a most beneficial exercise, and there is no doubt that many of us would benefit in general health with a little more activity.

Another reason for the renewed interest in this trustworthy means of locomotion is its ability to beat the car parking problem and traffic jam. Many business people, in fact, are now leaving their cars at home and travelling to work just as quickly, and certainly with fewer hazards, on their faithful steeds.

It is for a touring holiday, however, that a bicycle can be particularly recommended for those who are not afraid of a little exertion.

Riding in the splendour of the sun, with the road ahead shimmering in the heat-rays! This is what the holiday cyclist on tour anticipates. But even in a heat wave it is possible to keep comfortable on a bicycle if you go the right way about it. Watch your mileage; let your pace be leisurely. Don't attempt too much in a day — forty to fifty miles should be sufficient. And even this should be cut down in hilly country.

Often enough one sees young fellows going 'hell for leather' and getting all 'hotted up' to no purpose. There is no particular merit in covering twice the distance you did last year! Much more sensible to travel at a reasonable or even leisurely pace that conjures up a little breeze on a tropical-like day, and ride without any hint of physical discomfort.

An early start

Make an early start each morning of your tour, whilst the air is cool and dew-washed, and do most of your riding before the hottest part of the day. Be suitably clad. If you are a beginner, do not run away with the idea that the way to keep cool on a hot day is to ride bare-backed. It is much more uncomfortable if you get a blistered skin! Better to wear a thin vest of cotton and silk, and an open-necked shirt of fine material in which silk is embodied. A light jacket deflects the sun's rays. Shorts and thin stockings or socks, and comfortable cycling shoes, should be worn in preference to heavy stuff. But riding half-naked — never!

You should not overburden yourself, and thus make your work harder. Neither should you cut out any essentials for the sake of a couple of pounds' weight. Strike the happy medium. You will need

the usual cycling essentials — repair outfit, tools, lamps, cape or mac, etc. And your personal clothing will include a change of underwear, spare socks, pyjamas, slippers to rest your feet at end of day's run, spare pullover, first-aid compact, midge 'spificator' in tube, sun-tan lotion, holdall containing plate, mug, knife, fork, and spoon, in case you intend to spend a night or two at a Youth Hostel.

In addition, there are maps, either 1 in. or ½ in. ordnance sheets, and maybe a guide book of the region you intend to explore. Also you will find a camera and spare films useful for recording the places of interest you have discovered. Pictures are very nice to look at during winter, to remind you of a happy holiday in the sun.

Plan your route carefully. Study the map or maps of the region you wish to explore, and plan a not too strenuous itinerary which you can work easily from a central H.Q. This enables you to enjoy a day's riding with an unladen bicycle, which is much better than having to push a heavy load around all the time.

Food and drink

As regards food in hot weather when on the road, remember that less meat should be eaten under such conditions, but more fruits and salads. Thinly-cut bread and butter, with sliced tomatoes or lettuce between, are recommended for a snack when actually a wheel. The main meal of the day should be taken at the finish of the daily ride. Plenty of fresh

fruit will not hurt you in between. Tea at some wayside café will be more enjoyable than having to carry stove and kettle along with you.

During hot weather the rider will sweat, and this begets a thirst. Don't pander to the longing for a drink too much — the more you drink the more you want, as a rule. Always avoid 'gassy' or 'fizzy' liquids. A drink of tea, with little or no sugar, is a good drink, so too, is soda water or orange juice.

... and the machine

Don't neglect the machine which has to carry you. See that your seat is comfortable; let your position be an easy one. Gears should not be too high — a low variable gear is best. Oiling is necessary, but should be done sparingly — 'little but often' is a hot weather slogan when dust is all too prevalent. Give the wheel hubs a few drops of good lubricating oil occasionally during the day, when riding on dusty roads. Don't have your tyres blown up too hard — they will expand in the heat, and by midday become too 'board-hard' for safety or comfort. In hot weather the rubber sleeve of a tyre valve is apt to become gummy or sticky, so that you cannot pump air into the tyre if you need to. For remedy, hold a lighted match under the valve (placed in a horizontal position) for a few seconds, and then pump again.

Arrange for your nightly accommodation in advance when on a point-to-point ride, then you won't be stranded when night comes on. (E)

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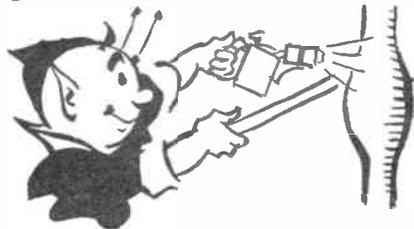
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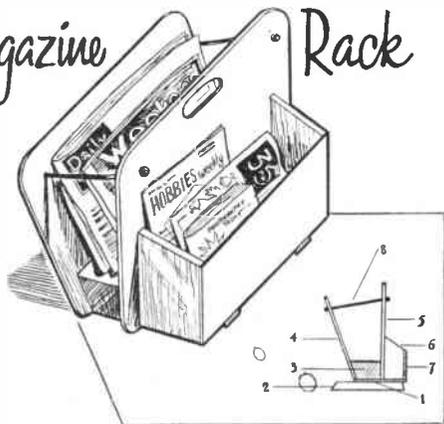
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the two top corners of both panels and provide a handhold cut from the top of the upright panel with the fretsaw.

The base can be built up of thinner wood or cut from the solid and has a sloping edge to which is serewed the front panel. Glue and nail the feet to the base. (To simplify construction, this panel could be fixed upright.) Next, the upright and sloping panels are added to the block. Build the box with front and sloping end members and fix this unit to the back panel and around the base piece.

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Remove any sharp edges, then paint. Give an overall painting of red or other bright colour with white for the inside surfaces of the rack. When dry, thread plastic thonging through holes between panels, securing with a tightly-drawn knot. These wires across open ends of the rack provide some additional support, but should not be tensioned so as to distort the rack. Further lengths can be added down the sides if desired.

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5. Back Panel 14 in. x 11½ in. x $\frac{3}{8}$ in. hardboard;
6. Endpiece (two) 6 in. x 3 in. x $\frac{3}{8}$ in. plywood;
7. Box Front 11 in. x 5 in. x $\frac{3}{8}$ in. plywood;
8. Thick plastic-covered wire or thonging (two 8 in. lengths.)

duction or transfer to the front of the magazine rack to give a professional finish. (T.S.R.)

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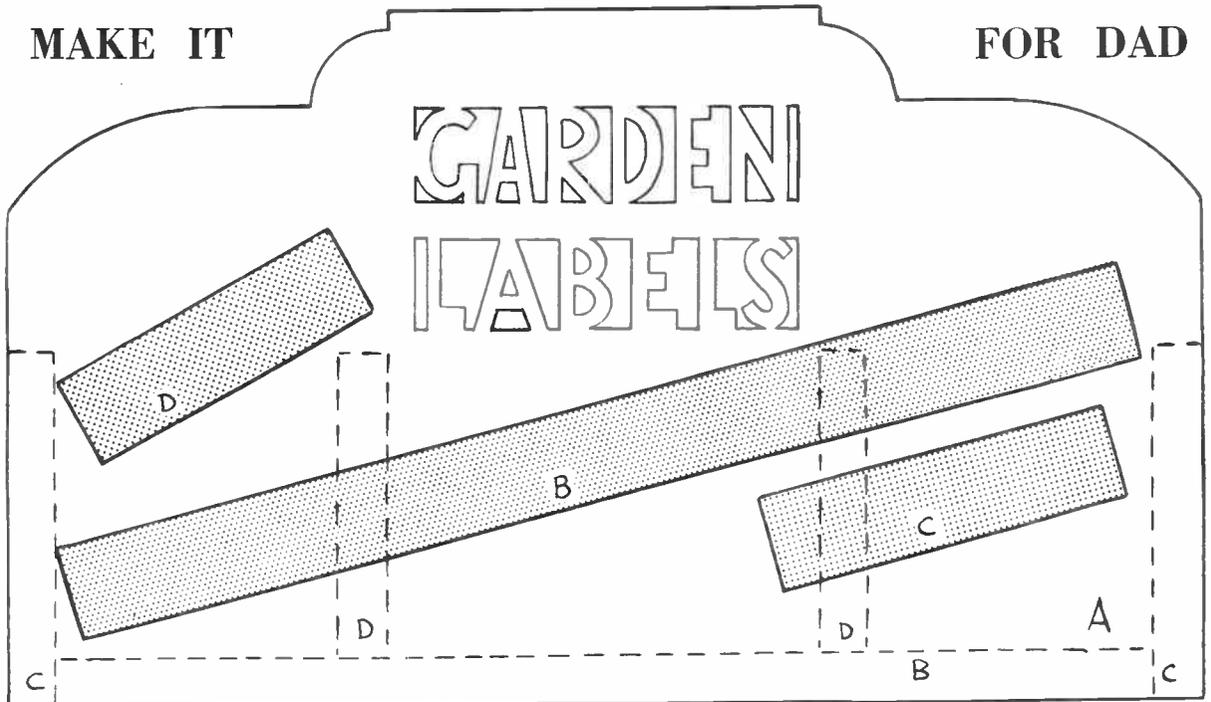
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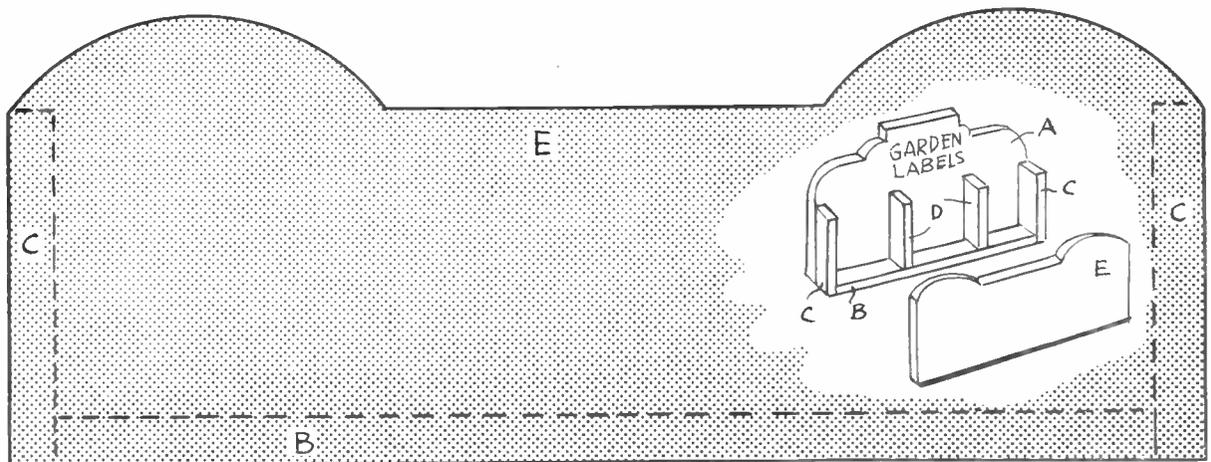


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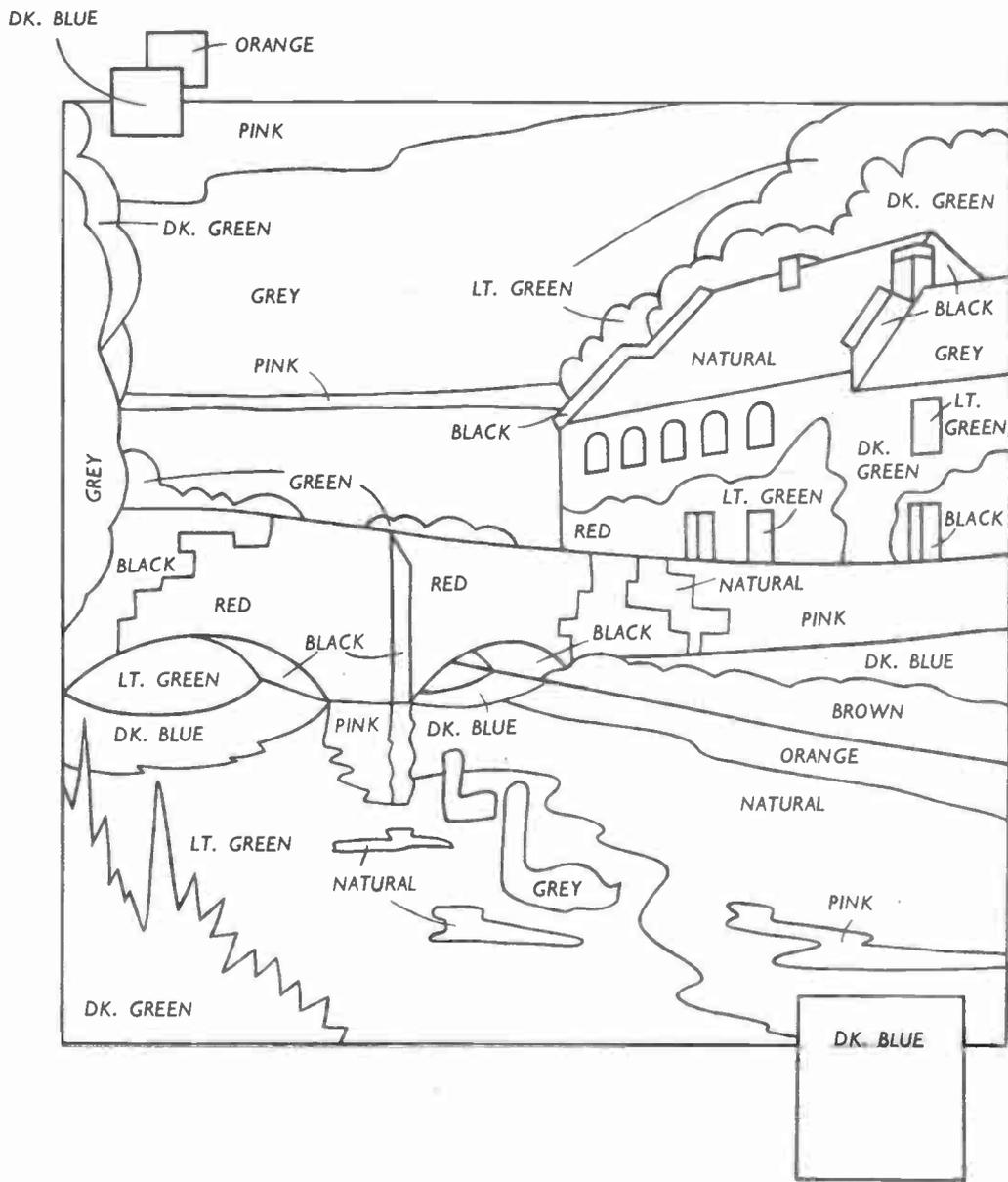


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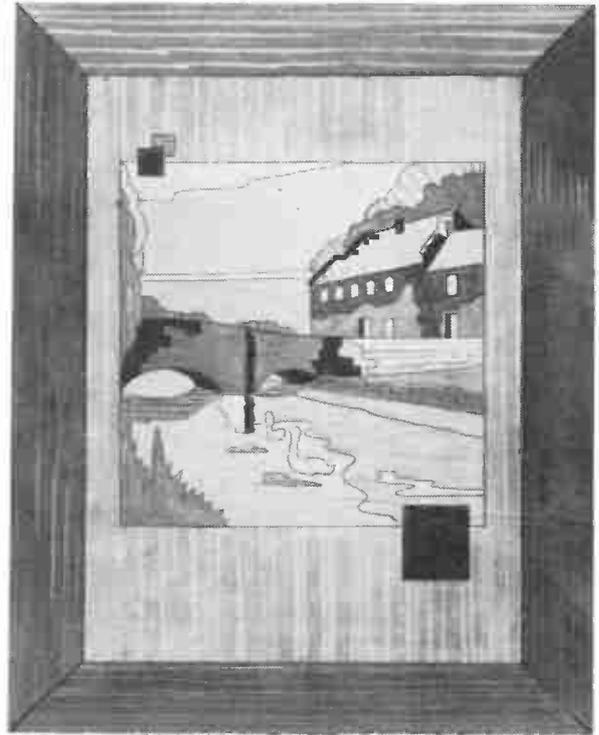
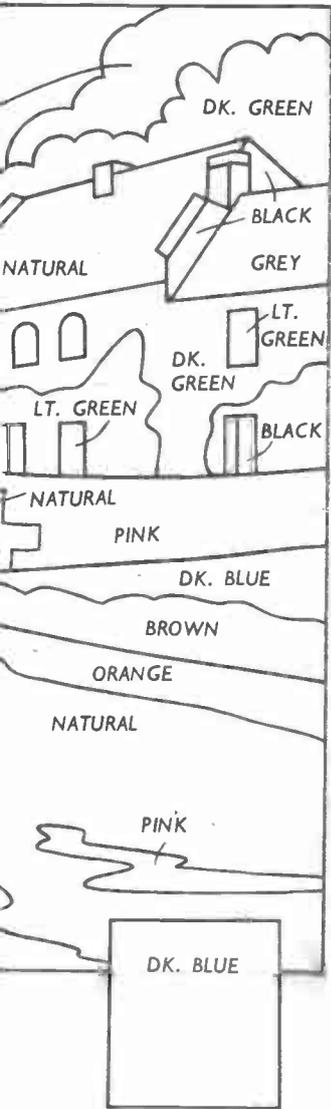
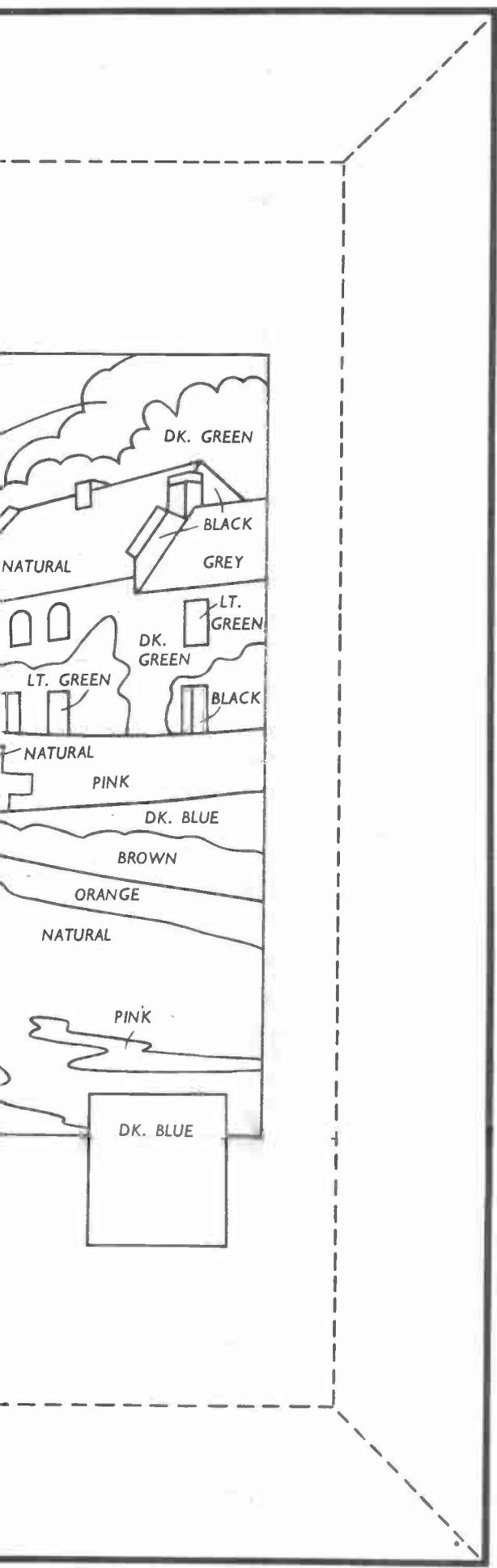
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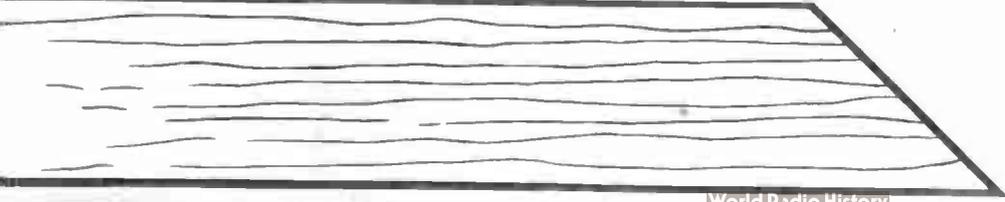
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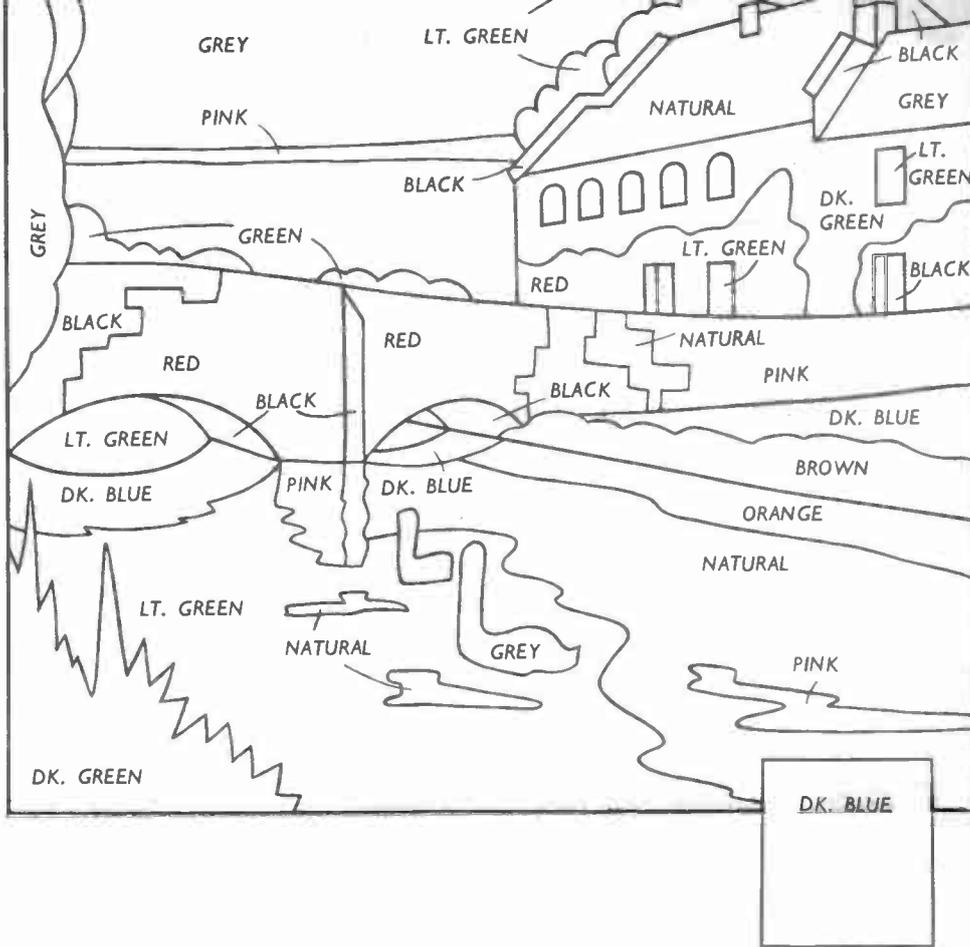
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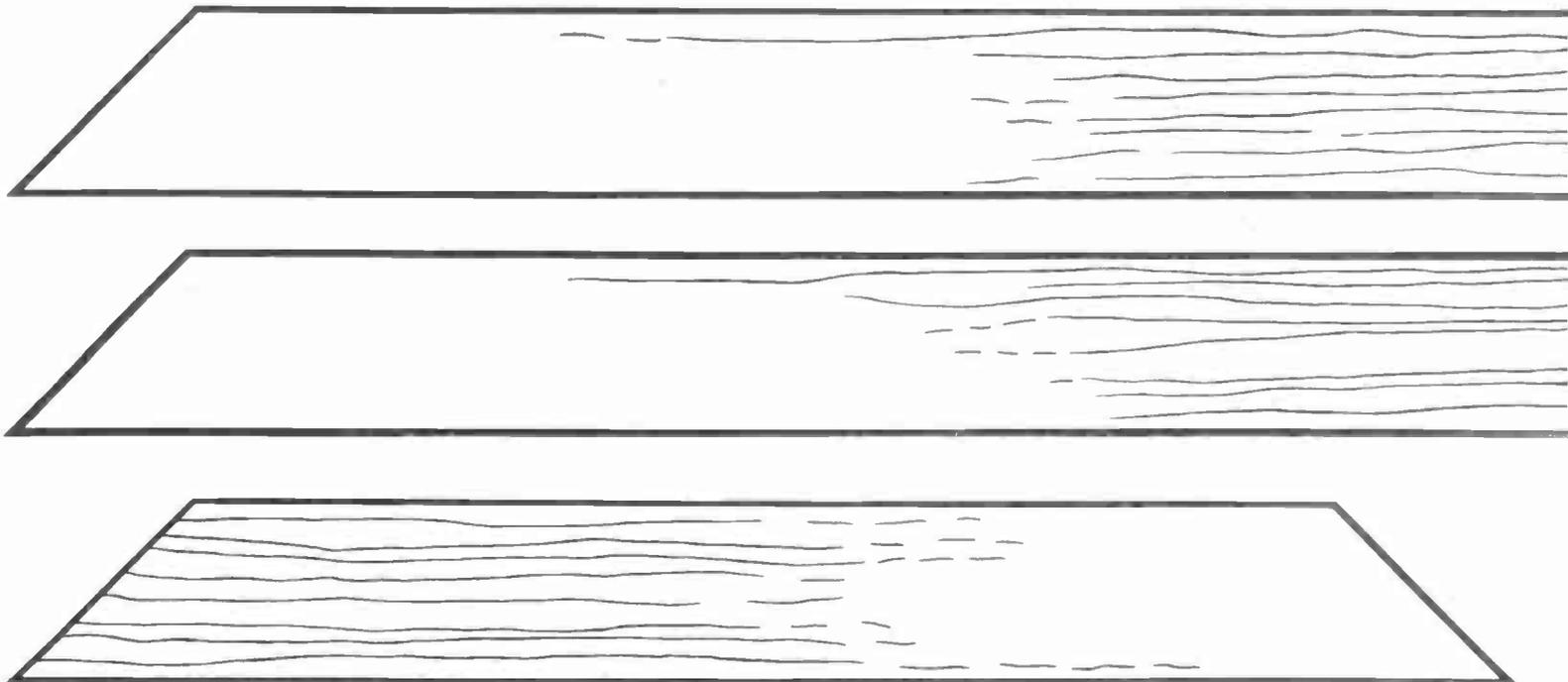
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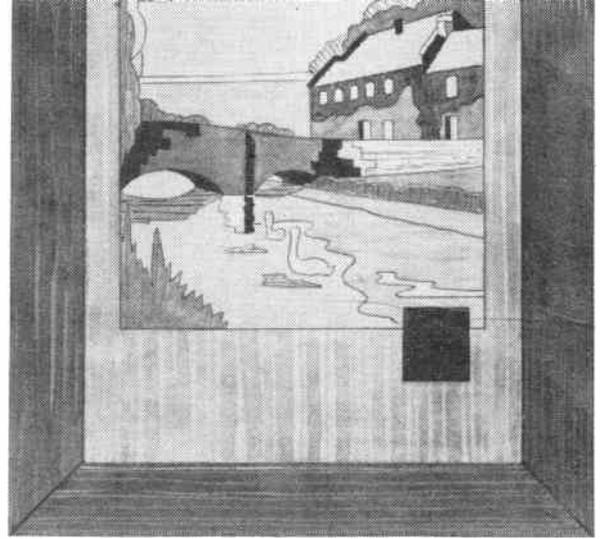
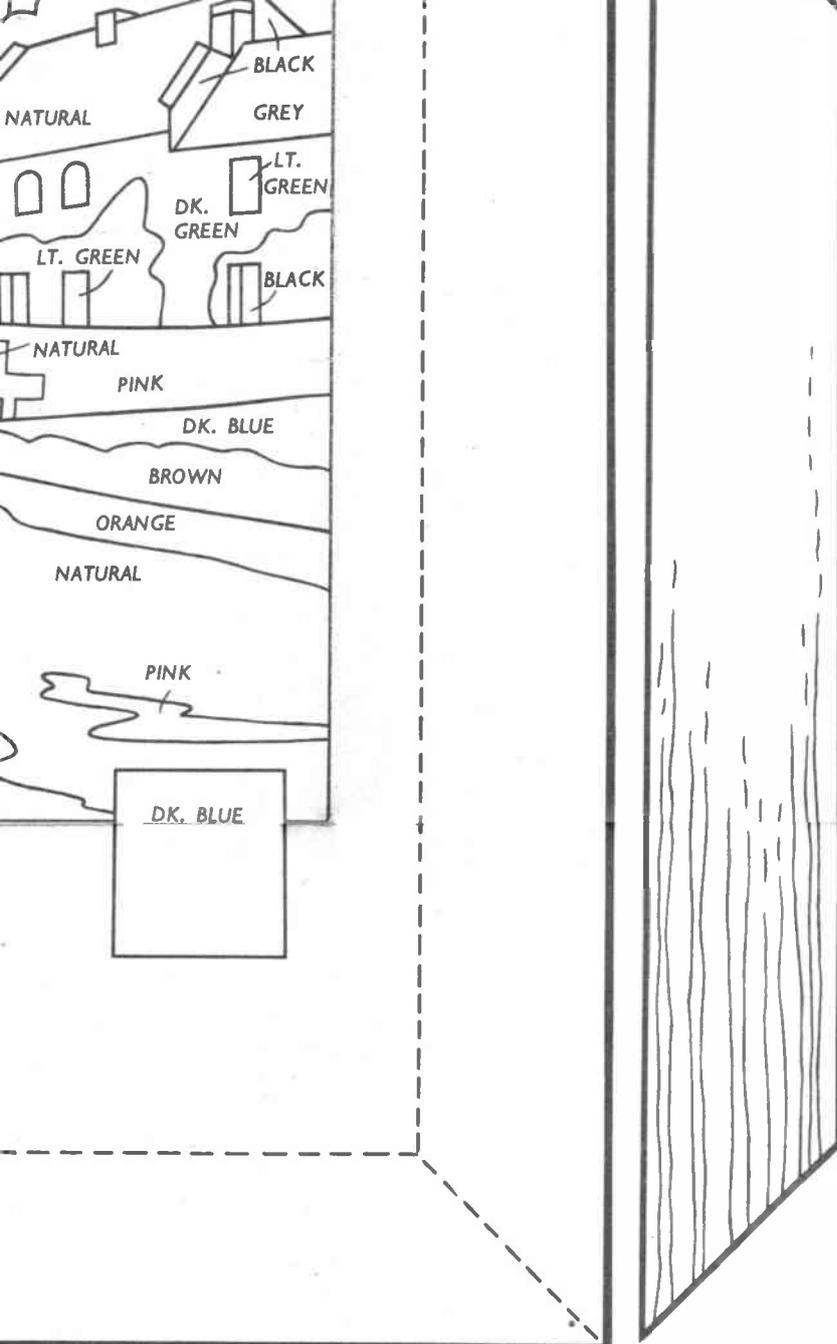


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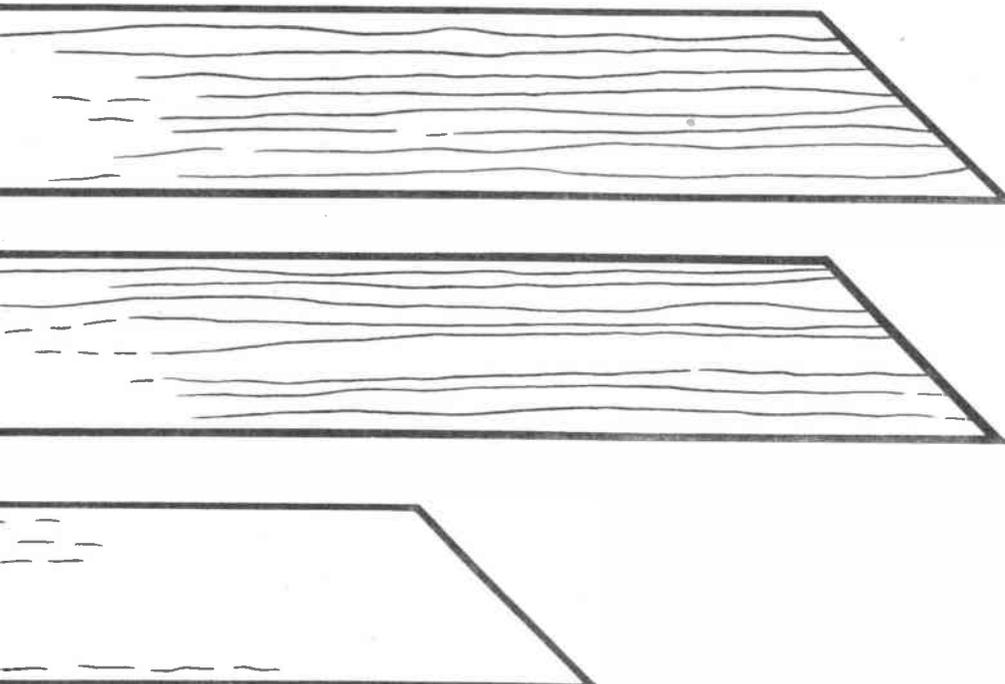
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