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THE ORIGINAL 'DO-IT-YOURSELF' MAGAZINE

HOBBIES weekly

FOR ALL HOME CRAFTSMEN

Full instructions for making . . .

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MAKE A BATTERY RADIO AMPLIFIER

PLANS FOR VINTAGE CAR CLOCK CASE

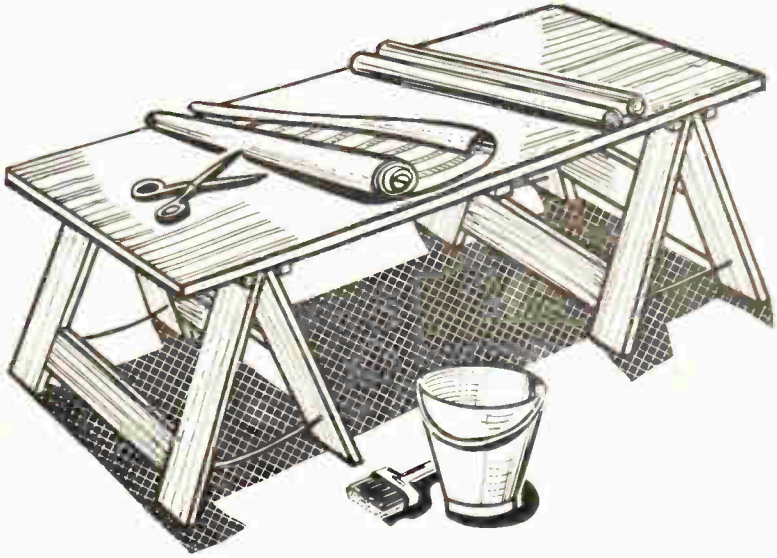
COLLECTORS' CLUB

START OF SERIES ON WEAVING

PHOTO LAMPS AND PRINTING

FLOWERING CACTI

ETC. ETC.



A TABLE FOR PAPER-HANGERS

Hobbies

Up-to-the-minute ideas

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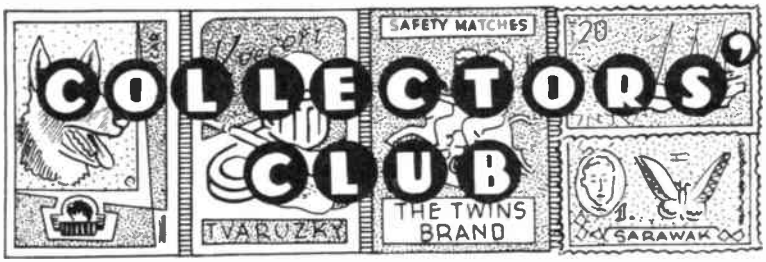
World Radio History



STRIKE UP THE BAND—1

MUSICAL instruments are older than written history. The earliest accounts of man mention them as in common use. Flutes, harps, lyres, and stringed instruments with long necks and finger-boards are pictured in wall-paintings of the time of Moses, and in the carvings on ancient Assyrian monuments.

In the Bible, Jubal is called the father of all who handle the harp and the pipe, the harp being in ancient times the common name of stringed instruments, as the pipe was of wind instruments.

Mercury is said to be the inventor of the lyre, which he gave to Apollo, who played it so sweetly that all the gods and even the cattle of the field stopped to listen. Orpheus, the son of Apollo, inherited the lyre, which he touched with such a masterly hand that he charmed wild beasts, and made the trees and mountains bow their heads and tremble with delight.

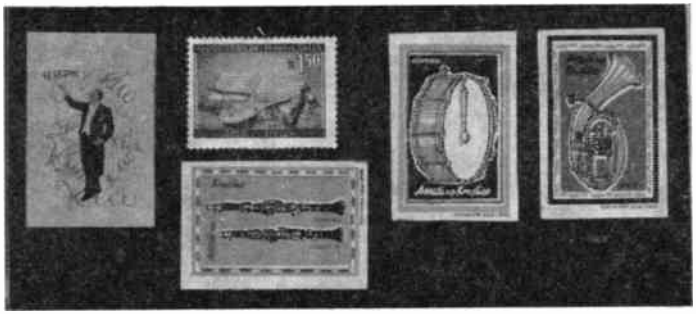
The lyre was the oldest instrument of the Greek minstrels. At ancient banquets minstrels were always present, sweeping the strings of the lyre as they sang of the glorious deeds of heroes and of the beauty of fair maidens. In Homers *Iliad* and *Odyssey* are frequent allusions to the lyre and the flute.

When Dr Schliemann was exploring the ruins of buried cities in the ancient land of the Trojans where the scene of the *Iliad* is laid, he found many fragments of broken lyres. Some were made in ivory. All were beautifully carved with graceful designs and decorated with gold and precious stones.

The lyre was in use for many centuries. But it is now an instrument of the past. Old lyres are valuable.

Flutes made of the bones of birds and other animals are found among the remains of the primitive cave-dwellers. But it is probable that before carving a bone flute, the cave-dweller cut a reed, drew the pith, notched the reed in holes, and blew on it, delighted to find that he could produce sounds like the sighing of the wind.

The reed flute represents the earliest form of musical instruments.



The next step, probably, was the stretching of strings over a sounding-board of skin or resonant wood, or across a rude wooden frame.

The drum was used in ancient times. There is not much music in a tom-tom. But there is inspiration in the roll and tap of the drum-sticks in the hands of a skilful drummer in a military band.

All nations, in shaping musical instruments, have tried to make them beautiful. The stringed instruments and flutes of savage races are often grotesque, even ugly to our eyes. But the poor savage did his best. He carved his instrument as well as he could and adorned it with whatever precious trinkets he had.

The ancient Chinese believed that music was of divine origin, that it was a gift from the gods to man. Ancient Chinese instruments are of neat workmanship. There is a small violin called ur-heen, which is made of dark wood, the head covered with snake-skin. It is not ornamented with any carved or inlaid designs, but it is beautifully made and the wood is polished smooth. There are only two silken strings, tuned in fifths, and played on with a horsehair bow.

A three-string banjo, also covered with snake-skin, has a long neck, the top of which, where the strings are fastened, is carved to represent a bat.

There is an ingenious mouth-organ called ti-tzu. The body is made of wood, and in it are inserted seventeen pipes. The notes are made by stopping the holes in the pipes with the fingers.

The Chinese love drums, which they call kou. The oldest drums were of baked clay with a skin head fastened on with nails instead of braced cords, which made it impossible to tune them as modern drums are tuned. The variations of tone were regulated only by the force of the blow.

The notes of Chinese music read, like the written characters, from right to left, and the intervals of the scale are different from those of the scale adopted by the nations of the West. The music is not very harmonious. It sounds meaningless and jangling to Western ears. But it has a pretty, musical cadence that makes it attractive and interesting in spite of its frequent discords.

Many musical instruments appear on stamps, labels, and cards, such as those illustrated. (R.L.C.)

A Portuguese Collector

Augusto Mayer writes: 'Since becoming a regular reader of Hobbies Weekly, I have found scores of friends. But I would like more for hotel label exchange'. Write to: Rua Luz Soriano 5 — 2°, Lisboa, Portugal.

World Radio History

LAMPS AND WIRING

By K. Baxter

AN alternative to making the side lights as permanent wall fixtures is to fix them to a wooden base. For this method you will require two 6 ft. lengths of 1 in. dowel rod with seven ¼ in. holes drilled through them at 9 in. intervals, and four 8 in. lengths of 2 in. by 2 in. softwood.

Two lengths of 2 in. by 2 in. wood are halved together to form a base (Fig. 1). The centre of this is then drilled out to receive the 6 ft. dowel rod, which should be firmly glued in position. The reflector is bolted to the wooden arm and attached to the dowelling as described in the previous article.

Mounting the reflector on a separate base has, of course, the advantage of making the light completely portable, in the manner of a studio boom light. A major disadvantage, however, is in the extreme vulnerability of photoflood lamps. The less they are interferred with the better.

The failure of a lamp usually takes place in the filament, which is readily distorted when hot. Subjecting the lamp to vibration will seriously shorten its life. Excessive movement will also have its effect, particularly if this takes place when the lamp is lit. Operating at a higher voltage than that for which the lamp is rated will further reduce its life.

The objective life of a 275 watt photoflood is approximately three hours, while one of 500 watts lasts about six hours.

The voltage range of a 275 watt No. 1 Photoflood is 110/115, 200/210, 220/230, 240/250; that of a 500 watt No. 2 Photoflood is 110, 115, 200, 210, 230, 240, 250. So you should have no difficulty in obtaining the correct rating.

The next consideration is that of wiring up. With three lights, other than the top light in use, it is generally found impractical to wire each one to a separate supply point. The solution is to use a distribution board operating from one power point.

At normal main voltages a No. 1 Photoflood uses about 1 amp., a No. 2 Photoflood 2 amp. This must be taken into account when using several light circuits from a single supply source as the consumption of current is increased proportionately.

For three No. 1 Photofloods the wiring must be of not less than 1 amp. It may be more, so that 2 amp. would be suitable. The three sockets to receive the plugs wired directly to the lamps should be 5 amp. and the main supply point 13 or 15 amp.

The method of wiring the side lights and back light is identical in each case. Twin flex is run from the lamp holder at the base of the reflector and connected in the normal way to a two-pin 5 amp. plug. A series/parallel switchboard of the double-pole single-throw switch type is then wired to receive them. The sequence of wiring, although it is not vital to adhere to this as long as the finished wiring is exactly as shown in Fig. 2 is as follows: 1 to 9, 6 to 10, 7 to 4, 8 to 3, 2 to 3, and 4 to 5. A length of wire, preferably rubber covered, is then run from 9 and 10 to the 13 or 15 amp. plug which is plugged into the main supply point.

When the switch on the switchboard is in the 'off' position the three lamps are operating in series. With the switch in the 'on' position the lamps are in parallel (Fig. 3).

Wired in parallel each lamp runs independently, receiving full voltage

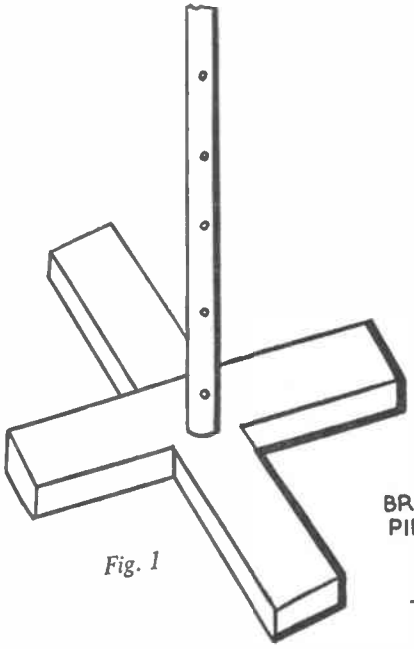


Fig. 1

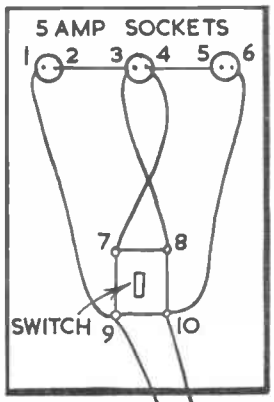


Fig. 2

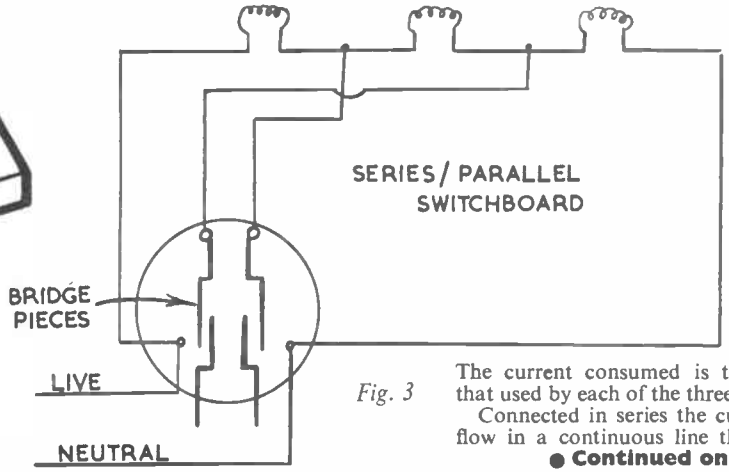


Fig. 3

The current consumed is the total of that used by each of the three lamps.

Connected in series the current must flow in a continuous line through one

● **Continued on page 417**

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Photographic printing

A Paper with Variable Contrast

By H. Mann

IN a previous issue we mentioned a a special enlarging paper having the properties of variable, controlled contrasts, obviating the purchase of hard, normal and soft grades. Only one paper grade is required for all your negatives, however much they may vary due to subject, contrast, exposure or development. And no matter how careful we are with the processing, we cannot expect to produce negatives of identical grading every time an exposure is made.

Thus many photographers have found that a single packet of Multigrade paper, made by Messrs. Ilford Ltd, contains the equivalent of five contrast grades when used in conjunction with a set of special filters.

The technique of printing on this paper is no different from that of other enlarging materals, with the exception that we employ the set of yellow filters, which increase in tone from the lower numbers, thus controlling the contrast of the paper. With a normal enlarger using an opal lamp, we require filters 1, 2, 3, 4 and 5, the lower numbers producing lower contrasts, and the higher numbers the more brilliant results.

These filters are made from coloured acetate foil and can be bought in sets or singly, a decided advantage if one becomes damaged, and they are obtainable either unmounted or mounted in cardboard holders for easy handling. We should also mention that the filters are held in the hand while the exposure is being made, but it is possible to buy a holder which leaves the hands free for other manipulations.

There are several ways of making a print on this paper. First of all we must consider the usual technique for negatives of average contrast, and here the accompanying illustrations will be helpful. Figure 2 shows an average negative, and for which the middle filter number 3 will be found quite suitable. An extremely contrasty negative is shown in Fig. 1 and for which the number 1 filter is required, while for the extremely flat negative (Fig. 3), we use filter 5 to improve the contrast. Where there are intermediate degrees of negatives use the appropriate filter; but whenever in doubt, it is better to start with the number 3 filter.

Fig. 1—Use No. 1 filter if your negative is like this one

Fig. 2—Use No. 3 filter

Fig. 3—Use No. 5 filter

The paper is laid on the enlarger easel as usual, and the filter held between the lens and paper while the exposure is being made. That is all there is to it! But the normal testing should be done to determine the correct exposure time. After developing and fixing, etc, the test can then be examined for contrast and then you can decide whether a different filter is desirable to produce either a higher or lower contrast.

Here we should say that it may be necessary to alter the exposure a little, and it should always be remembered that use of the higher numbered filters always demands more exposure than the lower numbered. If the normal opal lamp is used in the enlarger, and assuming that a ten-second exposure is correct when filter 3 is used, the approximate relative exposures for other filters would be as follows: filter 1, 9 seconds; filter 2, 9½ seconds; filter 3, 10 seconds; filter 4, 12½ seconds; filter 5, 14 seconds.

The foregoing outlines the normal procedure for the use of Multigrade paper, but there are other decided advantages as will be appreciated when we explain the 'mixed light' technique with a single filter. In this instance the exposure is made partly with the high contrast filter number 5, and partly without a filter, to determine the time needed to print the *middle tones* to the correct depth.

The following table will guide you in determining the correct exposure for the filtered and unfiltered periods of exposure to produce the best possible contrast. We would mention that the unit of time in this table is one tenth of the time required to produce correct density of the middle tones in the test strip.

No filter	*With No. 5 filter*	*Contrast*
10 seconds	0 seconds	Very low
7½ seconds	10 seconds	Low
5 seconds	20 seconds	Medium
2½ seconds	30 seconds	High
0 seconds	40 seconds	Very high

The advantage of using mixed light technique will be found in those subjects

World Radio History

where there are often different regions of brightness. Landscapes are a good example, including an area of sky which is usually dense and hard, while the foreground is soft. Frequently we resort to the method of shading, but you will see that the technique suggested will produce better results by exposing the foreground with Number 5 filter and the sky without filter.

When using this method the sensitized paper is exposed while first using the high contrast filter, the exposure time being that shown for the foreground test. This exposure is then followed by exposure of the sky area using either none or a low contrast filter, again giving the time which has been found correct by test, and shading the foreground area with an opaque card. Some other subjects can be made to give perfect results when negatives are difficult to print by normal methods on ordinary paper, but it must be remembered that the high contrast filter should be the first used.

Two surfaces available

Multigrade paper costs no more than any other enlarging paper and is made in two surfaces, glossy and velvet stipple. The filters cost 3s. 6d. per set unmounted and 9s. per set mounted. They must always be kept free from dust, and a soft sable brush is recommended for dusting to avoid scratching. When necessary, they may be wiped with a soft, damp cloth. A support can be obtained for 2s. 2d., and your complete outlay is 11s. 2d.

The filters will last indefinitely, provided they are carefully handled and stored, and the initial cost is neglible when it is considered that you are obtaining the means of using five paper grades in one packet. It often happens that photographic dealers do not stock the extra hard or extra soft grades owing to the small demand, and it will be appreciated that having these to hand — through filter control — will enable you to make prints to your complete satisfaction, however difficult the negative.

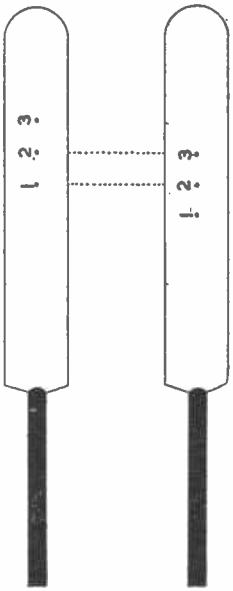
Photographs in this feature by courtesy of Ilford Ltd.

THE FAKIR'S BAT TRICK

By A. E. Ward

TRICKS with miniature bats and paddles comprise one of the many categories of magical effects. For the example described here you will need a little cricket bat carved out of ⅛ in. thick sheet balsa wood. You will also require a 2 in. nail. Let the blade of the bat be 6 in. long and 1 in. wide. with a 3 in. long handle, as illustrated. Finish off your shape by smoothing it with fine grade glasspaper before painting the handle black and the blade bright yellow.

Now you must prepare your bat as follows. Use a red hot nail to bore two small holes (1 and 2), in line, ½ in. apart, in the middle of the blade, starting about 4 in. from the handle. Next, make a 'false' hole (3) in line with the others, ½ in. away, towards the top of the blade, by pressing the hot nail only part of the way through the wood. Turn the bat over and bore a similar 'false' hole (1) in line with the true holes (2 and 3).



When you handle the bat casually and turn the blade, it should appear that you have merely drilled holes right through the wood. Cut out two sets of the numbers 1, 2 and 3 from a calendar 'book' and number your three holes, on each side of the blade. Push a 2 in. nail, or a wooden cocktail stick, into hole number one. When you turn over the blade, the nail will seem to have jumped into hole number two. Place the nail in hole number three. This time, when you turn the blade, the nail will appear back in hole number two.

Whilst performing the effect, hold the bat by its handle and end, between both hands, in order to prevent your audience from noting the exact positions of the holes upon the blade. It will also be advisable to hold the bat at your spectator's eye level and not allow light to shine through the blade from behind you to betray your secret. Practise handling the bat naturally whilst you bear these important points in mind.

Presentation of the little illusion may be along these lines. Show the bat and explain that it is a model of one owned by a famous Indian fakir, who was also a cricketer. 'One day, he was meditating on his bed of nails (here you produce the nail), when he had a bright idea. He took his cricket bat and knocked three little holes in its blade.' By now your audience will be interested and you can say: 'Here now — see for yourselves what he did.' Ask a spectator to push the nail into the middle hole. Shake the bat, turn it over and remark, 'See, the fakir's nail has jumped into hole number one. Let's try again.' Have the nail pushed into the third hole, and then make it 'jump' back into the middle hole. 'Yes', you say as you put the bat away safely in your pocket, 'it's really a matter of vibrations. Most Yogi magic is, I believe.'

● Continued from page 415

PHOTO LAMPS AND WIRING

lamp to reach each of the others in turn. The voltage of each of the lamps will then be only one-third that of the supply.

Photoflood lamps having a short objective life when used at full strength, the use of a series/parallel switchboard is a real boon. The lamps, which should be of the same type, are used in series while setting up your camera and arranging the general scene prior to taking the photograph. And although dim, you will find the lighting adequate for your needs.

When your subject and you are ready, the switch is moved to the 'on' position. Then, with the lamps in parallel and bright, the exposure is made.

A considerable number of hours is added to the life of a photoflood by the correct use of a series/parallel switchboard. It will cost about 5s. 6d. to buy and in next to no time will have effected a saving of many times that amount.

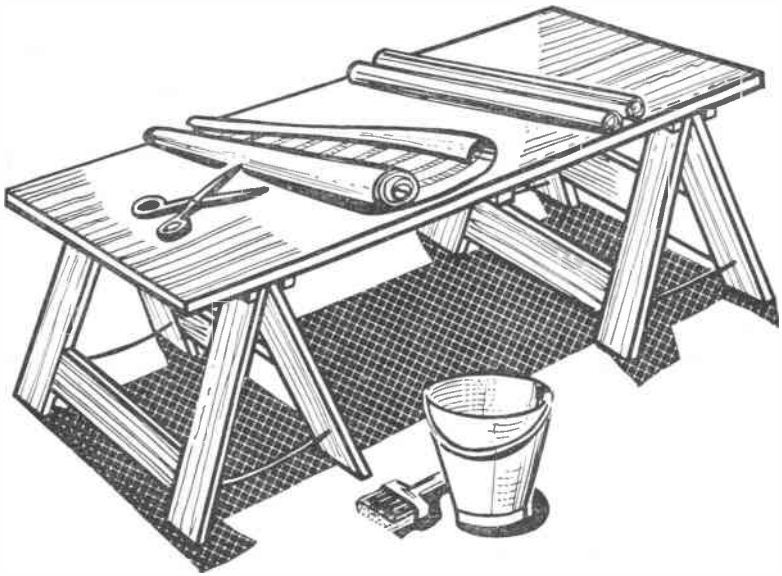
World Radio History

Instructions for making

A PAPER-HANGER'S TABLE

ARE you in the habit of hanging your own wallpaper? If so then you will know how important it is to have a suitably sized table or flat surface for cutting and pasting the paper.

Many home handymen improvise by using an old flush-panelled door or a spare sheet of hardboard or plywood spanned across some suitable supports. Although this make-do method of working may be quite satisfactory for the odd paper-hanging job, if you find yourself tackling this job regularly then why not add a proper paper-hanger's table to your equipment?



By K. Finlay

The one illustrated is an easy type to make. The construction is very straightforward and there are no intricate joints. When not in use the table can be dismantled into three units and stored flat.

Start by making the two supporting trestles. The timber used is 2½ in. × ¾ in. softwood which should be planed smooth all round. Cut eight legs each 2 ft. 6 in. long and a further eight rails each 2 ft. long. The members should be fitted together to form four frames as shown in Fig. 1. The best joint to use to join the rails and legs together is the halving joint. Half the thickness of the timber (⅜ in.) is removed from each member so that when they are assembled a flush surface is obtained on both sides of the frame. When assembling the frames the joints should be secured with flat-headed screws inserted from both sides. Make sure that each frame is perfectly square.

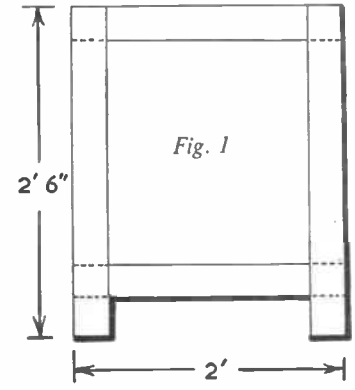


Fig. 1

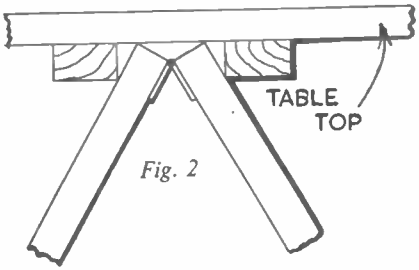


Fig. 2

The next job is to join the frames together in pairs to make two sets of folding trestles. Use two pairs of broad hinges for this purpose. In order that the trestle legs may be kept apart at a suitable distance when the table is in use attach short lengths of cord or lightweight chain between each pair.

Now we come to the making of the table top. This may be done in one of two ways. It can be made by simply cutting a piece of ¾ in. thick plywood or ⅝ in. thick blockboard to the desired size. A top measuring 6 ft. by 2 ft. will be found to be suitable. Blockboarding, incidentally, is a popular material consisting of a solid timber core faced on both sides with plywood. Alternatively, a light-weight frame can be made measuring 6 ft. by 2 ft. with 2 in. by ⅝ in. timber and covered on the upper surface with a sheet of hardboard or plywood.

It is a good plan to fix two strips of wood on the underside at each end to form two channels into which the tops of the trestles may go as shown in Fig. 2. This will ensure that the top remains perfectly rigid when the table is in use.

Rub over all the surfaces with glasspaper to remove any rough parts and sharp corners.

Practical Leatherwork

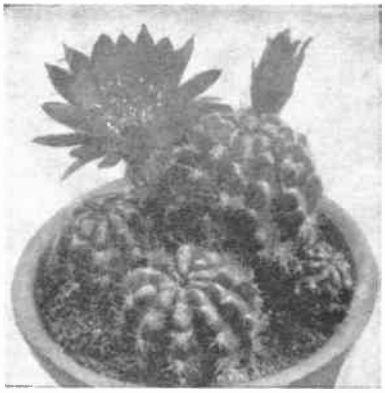
By E. Vear

THE demand for instruction in leatherwork in clubs and guilds is evidence that this craft continues to have a wide appeal as a creative hobby. It is with the express intention of helping such groups that this booklet, the 6th volume in 'The Work of Our Hands' series, has been written. It contains a mine of information for all those who work in leather, and also for the novice about to embark on this fascinating hobby. Tools, materials and the making of various projects are adequately described and illustrated.

Published by the Oxford University Press, Warwick Square, London, E.C.4. Price 3s. 6d.

World Radio History

CACTI & SUCCULENTS



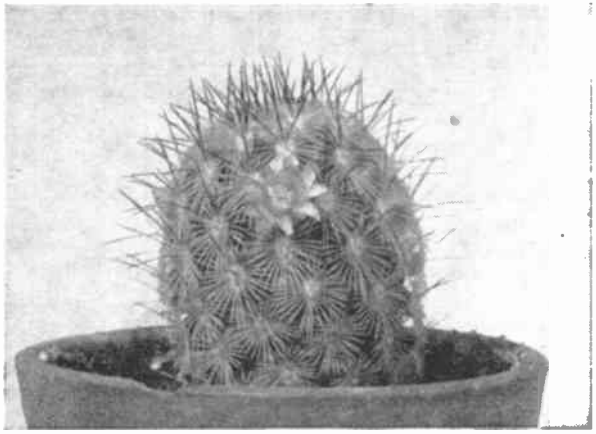
LOBIVIA HERTRICHIANA

3—VARIETIES FOR FLOWERING

THE great aim of every cactus enthusiast is to flower his plants. Providing the correct varieties are chosen, this should present no difficulties. In the spring and early summer there should be a blaze of colour on the staging or window-sill.

The genera which can be most relied on to flower are: Mammillaria, Rebutia, Lobivia, Parodia, and Notocactus. The Mammillaria do not produce the spectacular flowers of the others. However, although their flowers are small, Mammillaria will continue to bloom over a period of weeks, and in the self fertile species the flowers are often followed by brightly coloured berries.

Another point in favour of the Mammillaria is the great diversity of plant form. Even when out of flower, their beautiful spines make an attractive plant. Most of them have either cream or dark red flowers. It is fairly safe to say that on the whole the former are easy to flower whilst the latter do not do so readily as young plants.



MAMMILLARIA MICROHELIA

Amongst the cream flowered Mamillaria the following are easy to grow and flower: *M. wildii, M. longicoma, M. siedeliana, M. microhelia,* and *M. multiceps. M. wildii* is a dark green clustering plant and is undoubtedly the most free flowering of the Mammillaria. It produces rings of flowers from March through to October. These are followed by bright red berries, but the latter do not last long.

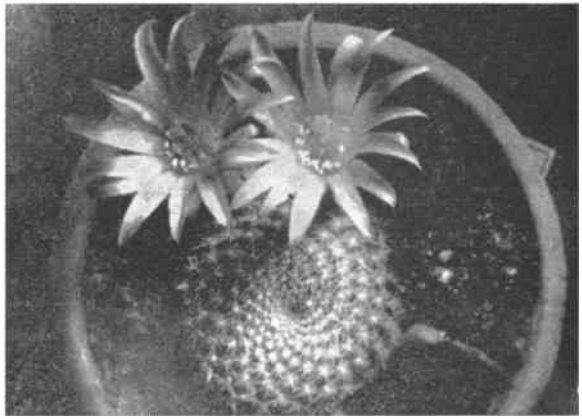
Another continuous flowerer is the long spined *Mammillaria longicoma.* This is a clustering plant and bears some resemblance to *M. bocasana. M. siedeliana* starts to flower when less than one inch in diameter; the flowers last for several weeks. *M. microhelia,* flowering in April, is one of the earliest Mamillaria to bloom. 'Microhelia' means 'little sun', and this aptly describes the arrangement of the golden spines. Lastly, *M. multiceps* is a clustering plant with grey spines and which rapidly forms a small cushion. It is also an early flowerer.

Probably the only red flowered Mammillaria which will bloom when less than one inch in diameter is *M. zeilmanniana.* This pretty little clustering plant produces quite large flowers over a period of several weeks. Two other red flowered varieties which the author has flowered when about 1½ inches in diameter are *M. hahniana* and *M. kewensis.* The former plant is particularly attractive as it produces long white hairs.

The Rebutia are small clustering plants, usually two to three inches across. They give the greatest variety of colours of any of the cacti; they can be red, cerise, pink, yellow and orange. The red Rebutia are the most numerous and include *R. minuscula, R. grandiflora, R. senilis, R, xanthocarpa,* and *R. kupperiana.* These are all good varieties. *R. senilis,* as the name implies, has long white spines which give it a particularly attractive appearance.

R. violaciflora and *R. senilis, variety lilacino-rosea* have cerise pink flowers and are charming plants. *R. xanthocarpa, v. salmonea* is salmon pink. *R. marsoneri* and *R. senilis, v. kesselringiana* are yellow, whilst *R. senilis, v. iseliana* is orangish.

There are many species of Lobivia. Some, like *L. hertrichiana* are clustering, whilst others such as *L. wrightiana* are solitary. *L. hertrichiana* has deep red flowers, whilst those of *L. wrightiana* are of an intense pink. *L. famatemensis* is yellow and one of the best-known of the Lobivia. All are good flowerers, and, being alpine plants, are hardy.



REBUTIA XANTHOCARPA

● Continued on page 421

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For crystal or valve sets

BATTERY AMPLIFIERS

THESE amplifiers can be used with any of the crystal set or 1-valver circuits previously described in *Hobbies Weekly*, to obtain increased headphone volume, or loudspeaker reception. When a 1-valve amplifier is added to a 1-valve receiver, this is the equivalent of a 2-valve set, and sufficient power for good speaker results, from local stations, can usually be expected.

If a 1-valve amplifier is used with a crystal set, reasonable speaker reception can often be obtained, if the crystal set gave really good headphone signals. When more amplification is needed, a 2-valve amplifier can be used. This can also be employed with a gram pick-up.

If the amplifier is added to a 1-valver, the batteries used with the receiver will also provide current for the amplifier stage, so that extra batteries are not needed. In the various circuits shown, the low tension supply leads are connected to the filament circuit of the 1-valver, and the on/off switch already present in the receiver will then switch off both valves. The H.T. leads can go to the battery, or to the H.T. points in the receiver, as proves to be most convenient.

The amplifiers can be built as separate units, and then connected to the receiver. Or, if space is available, the extra valve and other parts can be built into the receiver, so as to make it into a 2-valve set.

By 'Radio Mech.'

If any of the amplifier circuits are used with a crystal set, an on/off switch is included in the L.T. positive connection to the battery, so that the valve filament can be switched off.

Transformer coupling

This uses a coupling transformer with a ratio of about 1:3 or 1:5, as shown in Fig. 1. The primary (P) is taken to the phone terminals of the crystal set or 1-valver. The secondary goes to grid bias negative, and valve grid. A transformer intended for such purposes must be used, as others will be unsatisfactory.

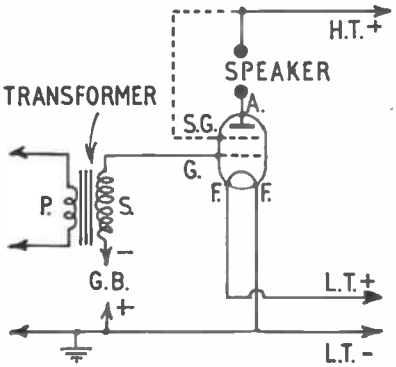

Fig. 1—Transformer coupling

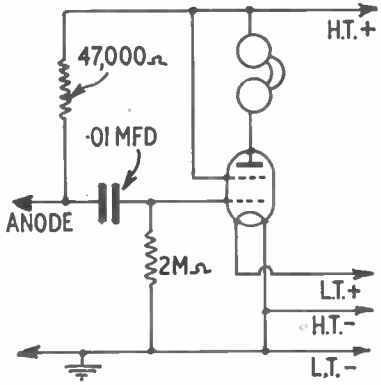

Fig. 3—Resistance capacity coupling

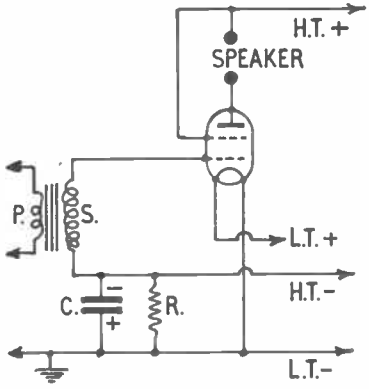

Fig. 4—Automatic grid bias

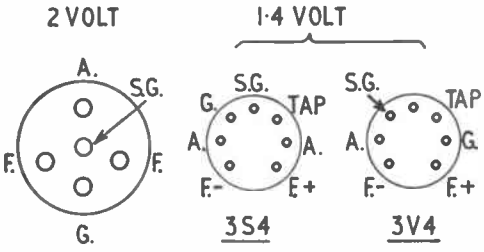

Fig. 2—Valve connections

For bias, about 3V. to 6V. will usually be wanted, this depending on the valve and H.T. battery voltage. Correct bias is the highest voltage which does not cause a distorted signal. The bias circuit plugs should therefore be tried in 1½V., 3V., 4½V., and other sockets on the grid bias battery, to find which is best.

If a pentode or tetrode valve is used, the screen grid is taken to H.T. positive, as shown by the dotted line. If the valve is a triode, this connection will not be present. Triodes are not much used, because they provide less amplification than does the pentode or tetrode.

A permanent magnet speaker with a cone about 3½ in. to 9 in. in diameter can be used. A 5 in. or 6 in. speaker will be generally convenient. Smaller speakers can be used, if a miniature receiver is to be constructed.

The loudspeaker must have a speaker coupling transformer. This is also called an 'output transformer'. It may be already fixed to the speaker; or it can be obtained separately. Primary goes to valve anode and H.T. battery, and secondary goes to the speech coil tags on the speaker unit. This transformer is always necessary with any of the circuits shown.

Tone is often mellowed by connecting a condenser of about ·005mfd. across the primary of the speaker transformer. That is, from valve anode to H.T. positive.

Valve connections

Fig. 2 shows pin connections for the older type of 2-volt pentode, and these are the same as for such triodes (as previously shown in the 1-valve circuits) but with a centre pin for screen grid. If a 5-pin holder is used, and wired for a pentode, a triode can be inserted instead, without changing any wiring.

For all-dry working, the 3S4 or 3V4 valves, or equivalents, will be more convenient. These valves can have a 3V. dry battery for filament, if the battery circuit is taken to F-negative and F-positive pins. But when a 1½V. dry battery is already used for the filament of a 1-valve receiver, the 3S4 ot 3V4 can be wired for 1½V. operation. To do this, join F-negative and F-positive pins, and use this as the positive connection to the 1½V. battery. The pin marked 'tap' (which is a centre tap on the filament) is then used as the filament negative connection.

Either of the Anode (A) pins of the

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3S4 may be used. The 1S4 type is the same as the 3S4, except that its filament is for 1½V. only. A 1S4 or 3S4 can be used with a H.T. battery of up to 67½V. A 3V4 can be used with up to 90V. Pin connections are as seen when looking at the valves or holders from below.

Resistance coupling

Two resistors and a condenser can be used for coupling, as in Fig. 3. This gives a little less volume than transformer coupling, but is often found. Current for the detector passes through the 47,000 ohm (or similar value) resistor. With a crystal set, use a ·1 megohm or similar resistor instead, and connect it to earth, instead of H.T. positive.

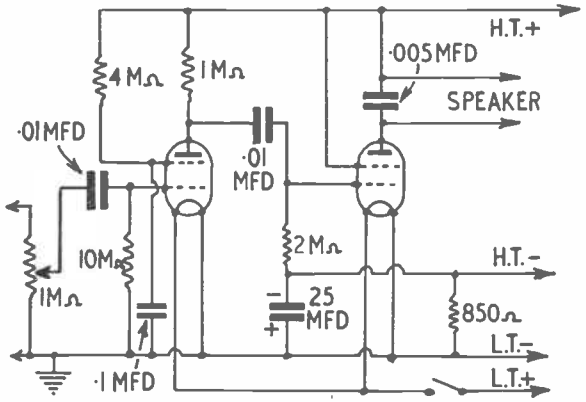

Fig. 5—A 2-valve amplifier

The detector valve should be a triode, or screen grid valve (1S5 or 1T4) wired as a triode. If a screen grid detector is used, fit a ·1 megohm resistor instead of the 47,000 ohm shown, and add a ¼ megohm resistor between detector screen grid and H.T. positive, with a ·1 mfd. condenser from screen grid to earth. (This is to maintain the correct relationship between anode and S.G. voltages.)

In Fig. 3 a 1S5 or 1T4 valve is used, for powerful phone reception. No extra grid bias need be used with these valves. Resistance coupling can also be used with 3S4 or 3V4 output valves, but grid bias should then be applied to the bottom of the 2 megohm resistor, exactly as shown in the transformer circuits.

Auto bias

To save having a small grid bias battery, modern receivers often use automatic bias. A circuit for this is shown in Fig. 4. If resistance capacity coupling is used, the 2 megohm grid resistor is connected to the H.T. negative line, instead of the secondary of the coupling transformer.

The H.T. current has to flow through the resistor R, which is of such a value that it produces the correct grid bias. For ordinary purposes, R can be 800 to 900 ohms, for a 3S4 or 3V4.

The condenser C is a large by-pass or bias condenser. Its value is not important, but 25 mfd. would be usual. These large value condensers have positive and negative tags or leads, and must be wired in correctly, as indicated.

If the H.T. battery voltage is changed, correct bias is still obtained, because voltage drop across the bias resistor R also falls. This is therefore a very handy arrangement. Any earlier valve has its earth return circuit joined to L.T. negative, *not* H.T. negative.

2-valve amplifier

A 2-valve circuit, for 1S5 and 3V4 valves, with a 90V. H.T. battery, is shown in Fig. 5. This gives much more amplification than can be achieved with a 1-valve amplifier.

The 1 megohm potentiometer acts as a volume control, and a gram pick-up or crystal set can be connected directly to it. If the amplifier is used with a 1-valve receiver, connect the ·01 mfd. condenser to the valve anode circuit (or high frequency choke), and add a 47,000 ohm or similar resistor, exactly as explained for Fig. 3.

More than two amplifying stages are seldom required. If the 2-valve amplifier is added to a one valve receiver, this will give similar results to a 3-valver. A 1-valve amplifier such as that shown in Fig. 3 can have extra components and valve added later, to make up a 2-valve amplifier, as in Fig. 5.

With pentode or screen grid type valves, transformer coupling is not often used between valves, because there is sufficient amplification with resistance coupling. But if triodes are used (for example, the older type of 2 volt valves), it is quite a good plan to use transformer coupling, to increase volume. Connections are very straightforward. The transformer primary goes to valve anode and H.T. positive. The secondary is wired to the grid bias circuit, and the next valve grid. Battery or auto bias can be used.

Volume control

By using a 1 megohm or 2 megohm potentiometer, a volume control can be added to the circuits in Figs. 1, 3 and 4. In Fig. 3, the volume control would replace the 2 megohm resistor, which is no longer needed. One outer tag of the control is wired to the ·01 mfd. condenser, and the other to the earth line (or bias, if provided). The centre tag, or slider, is connected to the valve grid.

If transformer coupling is used, the volume control is wired across the secondary of the transformer. The valve grid is then joined to the slider tag of the control.

The volume control can be of the kind which has a switch, and this can be used for filament switching. The one knob will then provide for on/off switching and volume, as in many modern receivers and amplifiers.

● **Continued from page 419**

FLOWERING CACTI

Parodia are one of the freest flowering of the cacti. The flowers are either yellow or red. These plants are solitary and since they grow slowly from seed, are never cheap to buy. They are always globular in shape and flower when about two inches in diameter. *P. chrysacanthion*, with long golden spines, is a particularly lovely plant; *P. auriespina* is attractively spined and one of the fastest growing of the Parodia. Both these plants have buttercup yellow flowers. A good red flowered species is *P. sanguiniflora*.

Notocactus have yellow flowers. *N. mammulosus* is a stout spined globular plant and flowers when about two inches in diameter. *N. ottonis* is a small clustering plant and should be watered very carefully, as it has a tendency to rot at the base. A layer of coarse sand on top of the compost will help to prevent this, and any 'touchy' plants can be so treated. Another good Notocactus is *N. concinnus* which has long slender spines.

All of these plants are quite easy to cultivate, but the Parodia should have extra sand in their soil. Otherwise the cultivation hints in the first article will apply. They all need the maximum light and if a greenhouse is not available they should, if possible, be put out of doors in full sun, once all danger of frost has passed. (P.R.C.)

Next: Epiphytic cacti.

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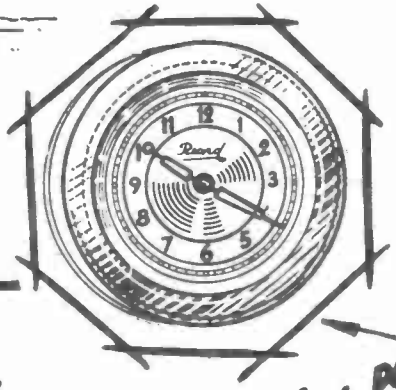
VINTAGE CAR CLOCK C

PIECE B SHADED CUT FROM
GLUE TO A

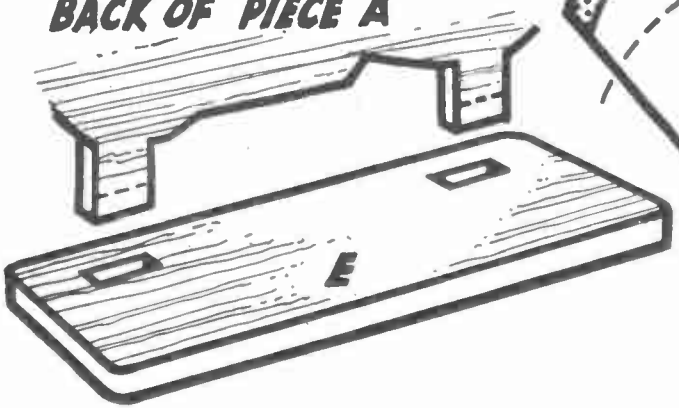
BASE E (HALF ONLY SHOWN)
CUT ONE 3/8"

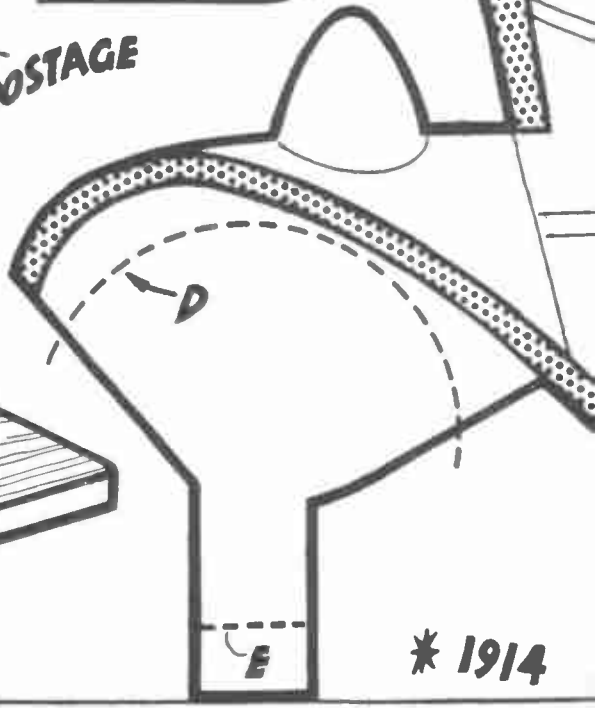
CENTRE LINE



HOBBIES CLOCK 5516 17/6 + POSTAGE

BACK OF PIECE A





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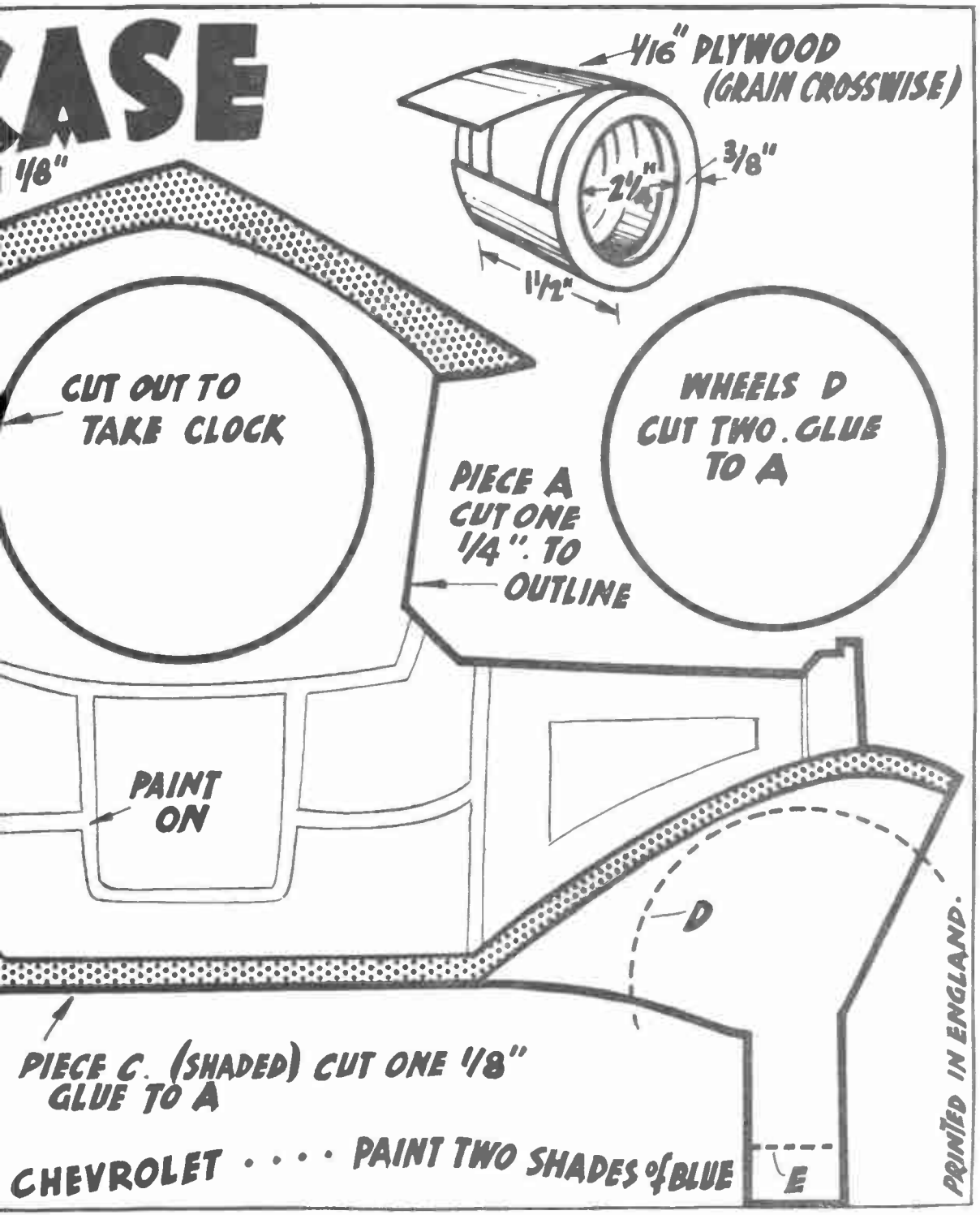

World Radio History

Weaving for Beginners—1

START WITH A CARD LOOM

MANY occupations have a language peculiarly their own, and the craft of weaving is no exception. For the beginner, these terms can be very confusing, particularly if some of them happen to have other associations. For example, to a weaver the word 'end' does not necessarily mean the extremity of a thread; it can also mean the whole thread, or the thread at any point, either the beginning, middle, or the end.

It is not necessary to commence weaving by learning a whole vocabulary; but some terms cannot be dispensed with, as one word which stands for a good many others helps to make for a better understanding of the instructions. The following are the most important terms for the beginner:

LOOM. A device for holding the longitudinal threads through which another thread is woven.

WARP. The equidistant longitudinal threads on the loom.

WEFT. The thread that is woven through the warp.

SHUTTLE. A device for holding the weft to make for easier weaving.

SHED. A number of warp threads that are lifted together to enable a row of weft to be passed through in one movement.

HEDDLE. An appliance for alternating sheds.

LEASH RODS. Another form of heddle.

WARP STICKS. Two sticks; one placed in each shed, to tension and space the warp and to prevent tangles.

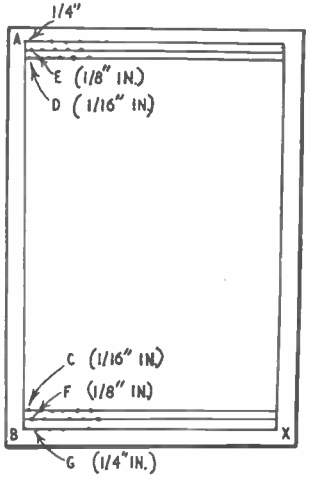

Fig. 1—Start at A, finishing at point X.

TABBY WEAVING. The simplest weave where each shed is woven alternately on a two shed loom giving a square-mesh pattern.

It is recommended that the beginner tries his hand at first with a simple card loom, so that he may get the feel of the craft, and discover before it matters much the snags he has to overcome. The first weaving should be considered as a sample, but a few squares made on the same loom may be sewn together for a specific purpose if desired.

The card loom

Take a square of thick card measuring

By G. A. Edmonds

6 in. by 6 in., and draw a frame ½ in. all the way around it. Along the top line make dots ¼ in. apart. Counting dots for the beginning and ending of the line, the number of dots should be twenty-one (see Fig. 1).

A ¼ in. below this line draw another, and mark it off in dots again ¼ in. apart. The first dot should begin ⅛ in. from the frame line, and the last should be ⅛ in. from the frame line on the other edge. There should be twenty dots on this line.

Another line is drawn ¼ in. below the second and a row of dots, ¼ in. apart, is drawn on it. The first dot begins 1/16 in. from the frame line and the last one 1/16 in. before, the other side line. There should be twenty-one dots on this line.

The same three lines of dots are marked at the other end of the card and, when finished, every dot on the card is punched accurately with a bradawl. The finished loom appears as in Fig. 1.

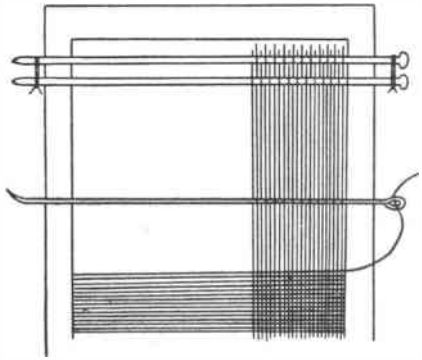

Fig. 2—Showing knitting needles used as warp sticks. Only part of warp shown.

The side lines play an important part in the weaving, as will be seen later.

To set-up the loom, use three-ply wool or cotton weaving yarn. Start with a threaded needle from below point A in Fig. 1, then take it up through A, down through B and up through C. Take it back to the top of the card and down through D and up through E. Back to the bottom and down through F and up through G, and so on until point X is reached, when the whole of the warp will then be threaded. If the thread has to be joined to another at any time, make sure that the knot comes below a dot. This is important should the weaver desire to use different colours in the warp.

This loom is too small to take a heddle, so the weaving is done by needle, usually a long one with a turned-up point, carrying a long weft. The weft is taken over and under alternate single warp threads to the end of the row and then is returned to make another row; but this time, where in the first row the weft was taken under a warp strand, it is now taken over, and vice versa. The third weft is a repeat of the first, and the fourth a repeat of the second, and so on.

The resultant weave, which shows a square mesh texture where an equal amount of warp and weft are visible, is known as tabby weaving. Complicated patterns can be produced by 'picking-out', which simply means passing a thread over and under through the warp in a certain order such as the following: under three, over one; under two, over four; etc.

Other textures can be produced in this way, and when an interesting pattern is discovered by experiment on these small looms, then a note should be kept on how it was made. These notes will be of interest later when working on larger looms.

The most interesting work for the beginner is in experimenting with the tabby weave to produce striped, checked, and tartan patterns. To produce checks, the warp is set-up in two colours which alternate across the warp, and the weft is threaded in the same order and colour. As this card loom has ten strands of warp to the inch, thread the loom alternately with ten strands of one colour and with ten strands of the other. Weave in the same manner, changing the colour after every inch of weaving. The beginner will discover that although ten strands of warp equals an inch, the weft may take less strands to equal an inch.

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Stripes along the length of the weaving may be obtained by setting-up the warp as for the check pattern, and using one of the same colours for the whole of the weft. In the same way horizontal stripes can be woven by setting-up a plain warp, and using two colours each alternately for the weft. Remember that the stripes will not turn-out completely of one colour, but will be checkered with the other colour.

To make a tartan pattern, many more colours are required, and the warp must be set-up with great care. If a tartan is studied, it will be found that across the multi-check of the ground pattern run thin over-stripes which if set up on a card loom would be no more than two or three strands wide. The beginner is advised against copying one of the well-known tartans for the time being. To gain the necessary experience he should invent one of his own, starting from the middle of the warp and working outwards on both sides with the same colours to obtain a balanced tartan. Here are two that can be tried:

1. **Red 6; White 3; Red 6; Green 10; White 3; Black 5; White 3; Green 10; Red 6; White 3; Red 6. Total 61 threads.**
2. **Blue 4; Red 2; White 3; Red 2; Blue 4; Black 5; Green 4; Red 5; Blue 3; Red 5; Green 4; Black 5; Blue 4; Red 2; White 3; Red 2; Blue 4. Total 61. threads.**

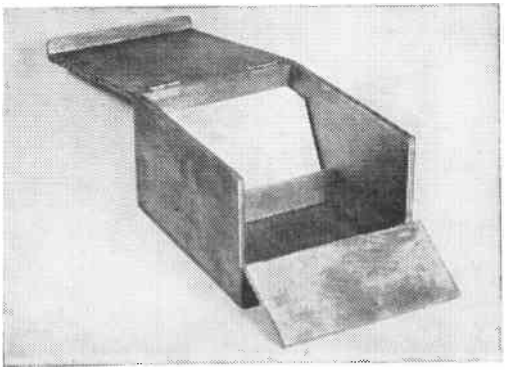
The weft is done in the same order of colours, and in the same quantity of threads.

After making one sample, the beginner will surely make both the following critical observations. Firstly, that another tool is needed to beat each row of weft up to the preceding one to give a tighter and neater weave; and secondly that, as the weaving grows, so the greater care is needed to keep it from growing narrower, or 'waisting'.

A beater can be made from a thin strip of polished wood, such as a ruler, which is placed in the warp after each row of weft to level it and force it closer to the preceding one.

Waisting can be prevented, or kept to the minimum, by keeping the edges of the weaving following the frame lines at the side of the loom, which were drawn on it when the loom was made. As substitutes for warp sticks, to keep the warp spaced and level, two knitting needles may be used. These are placed at the far end from the growing weaving, in alternate sheds, as in Fig. 2, so that the warp makes one cross between them. To keep them in place, the two ends are tied together by passing the thin string along grooves cut on both needles to prevent the string from falling off.

When the beginner has reached a reasonable degree of efficiency with the practice loom, he will want to work on a specific project. Instructions for some of these will be given in the next article in this series.



INDEX RECORD CARD HOLDER

IT is often useful to have a record card index in the house. This may be to keep references to particular articles in "Hobbies", or other periodicals, as a photographic index of prints or negatives, or for gardeners as a note on plants in their collection. No doubt many other uses will occur to the hobbyist or amateur handyman.

The record cards themselves in the most useful 5 in. by 3 in. size cost 2s. per hundred from stationers. A set of alphabetical dividing cards costs about 3s. The container described will hold several hundred cards and is far more robust than the usual cardboard affair.

A general view of the holder is shown in the photograph and Fig. 1. The two side pieces should be cut from $\frac{1}{4}$ in. plywood, being $3\frac{1}{2}$ in. wide and about 6 in. long. The latter dimension depends only upon the required capacity of the holder and may be more or less according to the number of cards expected to be filed. The $3\frac{1}{2}$ in. depth of the holder is necessary in order to accommodate the alphabetical dividing cards which naturally project above the others. The back piece should be $3\frac{1}{2}$ in. wide and $5\frac{5}{16}$ in. long, i.e. allowing for the two $\frac{1}{4}$ in. thick sides, the internal width will be just over 5 in.

The front of the holder is in two pieces, the lower being about 1 in. wide and the upper half hinged to it at A. Two pieces of similar plywood are cut for the base and top, being $6\frac{1}{2}$ in. by $5\frac{5}{16}$ in. The bottom is of course fastened directly, but the top is hinged at B and a strip of $\frac{1}{8}$ in. plywood $\frac{5}{8}$in. wide fastened to the front edge of it to overlap and secure the hinged front when closed. Fig. 2 shows a section of the holder when closed.

Of course if the wood used is more or less than $\frac{1}{4}$ in., the external dimensions will be slightly altered, but the only critical ones are depth and width. The pieces may be fastened by gluing and nailing with panel pins.

A small strip of wood can be seen in the photograph, just in front of the cards. This is simply a strip of thin plywood, about 1 in. wide and just long enough to be sprung between the sides. It thus acts as a movable stop to prevent the cards from slipping when there are not enough to fill the holder.

Finally the holder should be glass-papered and stained or painted.(P.R.C.)

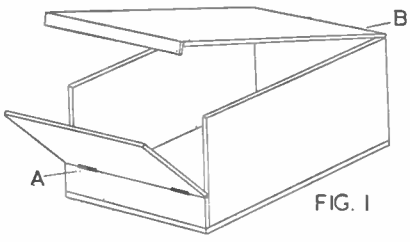


FIG. 1

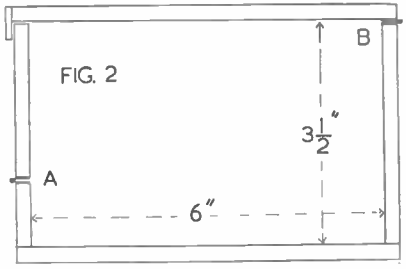


FIG. 2

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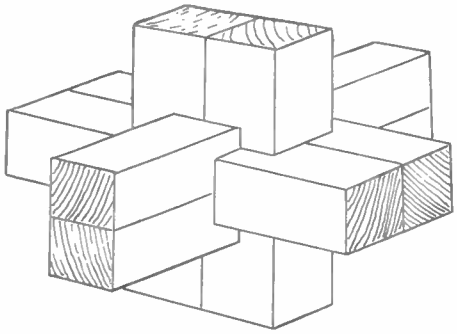
AN INTRIGUING WOOD PUZZLE



By H. Mann

THIS wood puzzle offers a real challenge to your skill as a maker of accurate joints and solver of puzzles. There are six pieces altogether, five of which are prepared in accordance with the diagrams.

You are recommended to use 1 in. square section in a soft wood like balsa for easy cutting and note that it is essential that the material is square if the parts are to fit together. You may use ½ in. square section but the joints will be a little more tedious to cut and any dimensions must be halved. Use a fine tenon saw for cutting after carefully marking out with a scriber.

Cut off six 4-in. lengths from the 1 in. square section, preparing the pieces as shown. Number 1 requires no treatment whatever and the measurements in the others are either 1 in or ½ in., although it will be appreciated that there is a slight variation in the internal shoulders. As an example we might quote piece number 2. Mark off 1 in. from each end, then another ½ in., adding a centre line downwards. Two square cuts are made from the top to a depth of ½ in., then two cuts inwards on the left side to a depth of ½ in. at the 1½ in. marks. Remove the waste with a chisel or sharp knife, then finish the tapering centre joint.

Piece number 3 is clearly marked and the preparation of pieces 4, 5 and 6 should now be apparent.

If necessary you should carefully smooth the joints with glasspaper and it sometimes helps the final solution of fitting together if the sharp edges are removed — but only very, very slightly.

You may meet some puzzles in preparing the joints but there still remains the question of fitting the six pieces together in the form of an interlocking cross. Here is the solution.

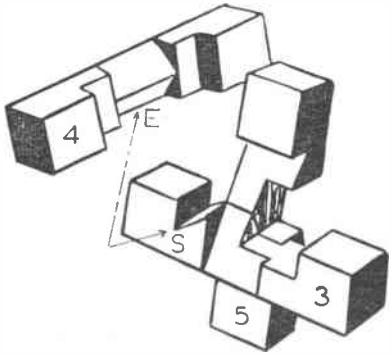


FIG 1

The assembly of the parts into the shape of the cross is not as difficult as may be imagined, but for the sake of convenience you should refer to the original separate drawings of the pieces, numbering them accordingly with a pencil.

Take up numbers 3, 5 and 4, fitting the two former pieces together as shown in Fig 1. Piece number 4 is shown on the left of this diagram and the procedure is to fit this to the other two so that the outer edge of the bevel E fits into the slot marked S in the diagram.

Fig. 2 shows the position after piece number 4 has been fitted and with piece number 6 ready for dropping into place, the two central points indicated by the arrows fitting together. When this part has been fitted the next to add is piece number 2, the positioning of which will be obvious. The plain piece number 1 comes last and locks the whole together.

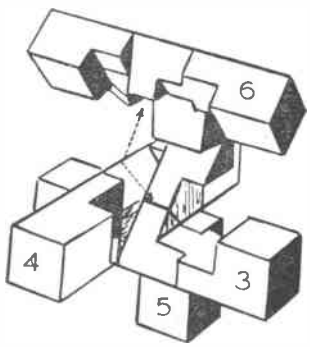
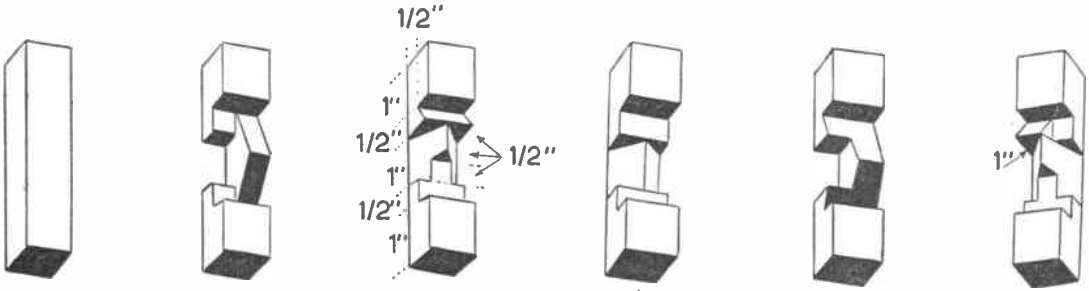


FIG 2



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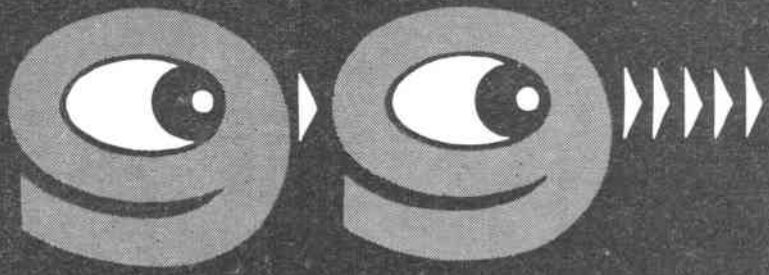

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World Radio History

Making a Razor Blade Compass

By A. E. Ward

DURING the second world war compasses contrived with steel razor blades were used in successful escapes from prisoner-of-war camps in Germany. To would-be escapers a magnet was an object truly worth more than its weight in gold, for it could be used to manufacture any number of valuable compasses. In order for you to make a useful compass, similar to those cleverly improvised by our servicemen, you will need some stout cardboard, a collar stud, a cork, a pin, and a used razor blade of the 'three-holed' type.

Start by making the compass card. Use a piece of white cardboard measuring 2½ in. square. With pen and geometrical compasses draw a black 2 in. diameter circle in the middle of the card. Rule a heavy black line through the centre of the card to indicate North and South, then draw a heavy red line, at right angles to this, to represent West and East. Draw faint red lines, accurately, to indicate the four ordinal points of the compass. The four cardinal points are neatly marked by cutting out the block letters N, S, E, and W, from a magazine heading, and then pasting these into place. Draw a heavy black arrow-head upon the card, pointing to North.

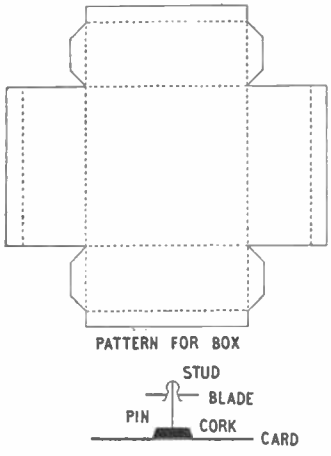
Make the box, measuring 2½ in. by 2½ in. by 1 in. by first marking the pattern illustrated upon stout cardboard and then cutting out the shape, using sharp scissors. Score along the lines to be folded by means of a metal ruler and a point of the scissors. Glue the compass card to the bottom of the box and proceed to assemble the sides and a ¼ in. wide border round the 'face'. Glue the tabs firmly into place. Balsa cement will be found to be an admirable quick-setting adhesive.

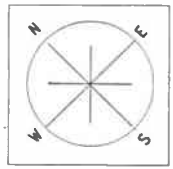
A steel razor blade is easily magnetized by means of a powerful bar magnet. Place the blade upon the table and then commence stroking it, right along its full length, using one of the two magnetic poles. Before each subsequent stroke the magnet must be lifted well clear of the razor blade. Twenty or thirty strokes will suffice. Now your blade will be permanently magnetized. The opposite pole to the 'stroking pole' of the bar magnet will have been induced in the end of the blade which was at the termination of the strokes. Paint the blade black and glue a red paper triangle upon it to mark its North-seeking pole.

Use a wetted penknife to cut a neat ¼ in. thick round slice of cork which will serve as a pivot mount. Paint the cork black. Press the head of the pin into the cork and let the point of the pin stand vertically erect. Glue the cork and pivot to the middle of the compass card. Obtain a collar stud, such as are used to secure the necks of new shirts, and suspend this over the point of the pin. Fix the razor blade compass 'needle' upon its mounting by slipping the 'head' of the stud through the hole in the middle of the blade. You will find that the blade will balance well and swing around until it points to Magnetic North. Turn the box gently until the red arrow-head upon the blade is exactly over the North point of the card. It will now be possible to take a rough compass bearing.

The instrument is completed by covering the box with a piece of celluloid or thin picture frame glass. Secure this with strips of Sellotape. Care must be taken to ensure that the glass top is near enough to the head of the stud to prevent the blade becoming dislodged when the box is inverted. Paint the box jet black with a waterproof paint and fix red coloured gummed paper strips along the edges of the top, in order to cover the Sellotape and provide a tidy frame for the compass.

Use your compass at night to confirm that Magnetic North is somewhat West of the North Star, which is due Geographical North, over the North Pole. The familiar 'saucepan-like' pattern of the seven bright stars of the Plough constellation, with its two 'pointers', will show you where to find the pale North Star.





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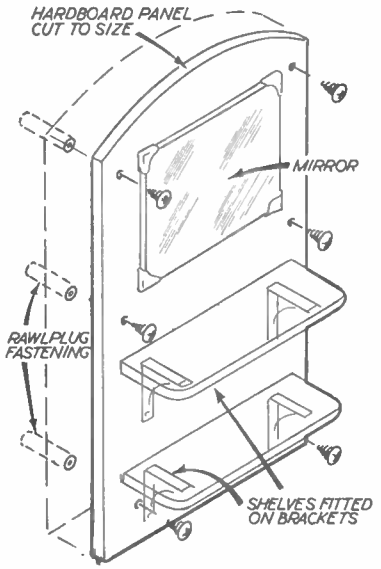

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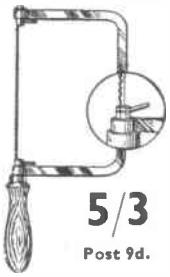
Is This Saw in Your Kit?



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World Radio History

All about Marzipan Sweets

By A. F. Taylor

THERE is no question about marzipan being one of the most popular sweets. Besides being so very appetizing it is most nutritious, and in this form the nuts are made more digestible.

There are two types of marzipan; one made by boiling the ingredients and the other without the use of heat in any form. Boiling makes a more plastic sweet and one that can be moulded much easier.

Unboiled marzipan

½ lb. icing sugar
½ lb. ground almonds
2 egg whites
½ juice of lemon

Sift the icing sugar and place in a basin with the ground almonds and thoroughly mix with the fingers. Then whisk the egg whites slightly, add to the mixture and knead until it is smooth and firm. Should this appear too dry the consistency can be corrected by mixing in a few drops of gelatine water.

When adding the lemon juice it is best to do so very gradually, but if you do happen to put in too much, a little ground almonds and icing sugar added in equal quantities will put this right.

Boiled marzipan

We have chosen two of the very many recipes for boiled marzipan, the first one (A) being very easy to make, and the other (B), while being a little more complicated should produce a slightly smoother sweet.

(A) 1 lb. sugar
6 oz. ground almonds
1 oz. glucose (maize syrup)
1 small teacup water

Dissolve the sugar and glucose in the water and then boil without stirring until the temperature reaches 235°. Remove the saucepan from the stove, stir in the ground almonds and beat up until fairly stiff. When cold, place a little icing sugar on the table and work up the marzipan until it is nice and pliable.

(B) 1 lb. sugar
¾ lb. ground almonds
1¼ gills water
2 egg whites
1 teaspoonful rose water

Dissolve the sugar in the water and then boil without stirring until the temperature reaches 240°. Remove the saucepan from the stove and allow to cool for a few minutes. Now stir gently until the syrup shows a slightly cloudy appearance and then stir in the ground almonds.

The egg whites should now be beaten a little and added to the syrup and stirred in while the pan is placed on the stove again for a few minutes. Add the rose water and turn out on to a marble slab or large meat dish which has been dusted with icing sugar. Allow this to cool and then work it with icing sugar until quite smooth and pliable. When marzipan is wanted coloured it is best to do it during this last stage while kneading it smooth.

Marzipan may be stored in this state for a few weeks if it is first wrapped in waxed paper, then wrapped in a dry tea towel and put in an air-tight tin.

Marzipan intended for moulding into various fruits and vegetables should be coloured as near as possible to the subject being copied. Over colouring, however, should be avoided and pale pastel shades are more attractive for the job.

Marzipan Neapolitans

This is a very nice way of making up your marzipan into a most attractive sweet. You will need three or four equal portions of differently coloured marzipan and they may be suitably flavoured.

Do not over colour or over flavour, and here are a few suggestions. Plain marzipan is usually flavoured with vanilla, pink colouring indicates raspberry or strawberry, while green is always flavoured with almond, and coffee colour of course is just coffee.

Each coloured batch is first rolled out into strips about two inches wide and ⅛ in. thick, and then the top of each is brushed over with either gelatine water or egg white. Gelatine water is made by dissolving powdered gelatine in warm water in equal parts, while the egg white should be beaten slightly.

A piece of wafer paper is now placed on the table and then the marzipan strips placed one on top of the other and finished off with another piece of wafer paper. Cover with waxed paper, place a board on top and then a weight to flatten it out and help to stick the various pieces together. Leave till next day, then trim off any rough edges and cut into convenient sized pieces. Wrap each piece in waxed paper or cellophane.

Harlequin Balls

After trimming up your marzipan neapolitans there will be a number of assorted pieces left over. These and any fragments of coloured marzipan left over from any other recipe can be made into an attractive sweet.

Take an assortment of coloured pieces and knead them lightly so as to just hold them together but not to mix the colours. Roll this out to a little larger than a pencil, cut into neat pieces and roll them lightly in castor sugar.

Marzipan Ginger Squares

Take a batch of plain marzipan and knead in a few drops of ginger essence. When well mixed in roll it out on a board covered with icing sugar and then cut up into neat squares or other suitable shapes. In the centre of each shape press a small piece of glacé ginger and set aside to dry.

Marzipan placed on top of a cake and many other confections is always very acceptable and helps to make them even more delicious. Here then is a simple recipe for a nice almond icing.

Almond Icing

1 lb. ground almonds
1 lb. sugar
Yolks of 3 eggs
1 whole egg
Almond essence

Thoroughly mix the ground almonds and sugar together in a basin, and while some people use castor sugar others prefer icing sugar. Gradually mix in the eggs, stirring with a knife, then add the almond essence, but do not overdo this. Almond essence is a very strong flavour and can be objectionable if too much is used.

At this stage the mixture can be kneaded with the hands so that all the ingredients are well mixed.

Sprinkle some icing sugar on a board and with about three quarters of the batch make a ball and press out flat to the size of the top of the cake. Brush some white of egg on top of the cake and lay the almond paste on to this.

Press down and smooth with a knife, then the remainder of the almond icing is rolled into a strip and applied in a similar manner round the side of the cake. Leave to dry until next day when white icing is put over this if needed.

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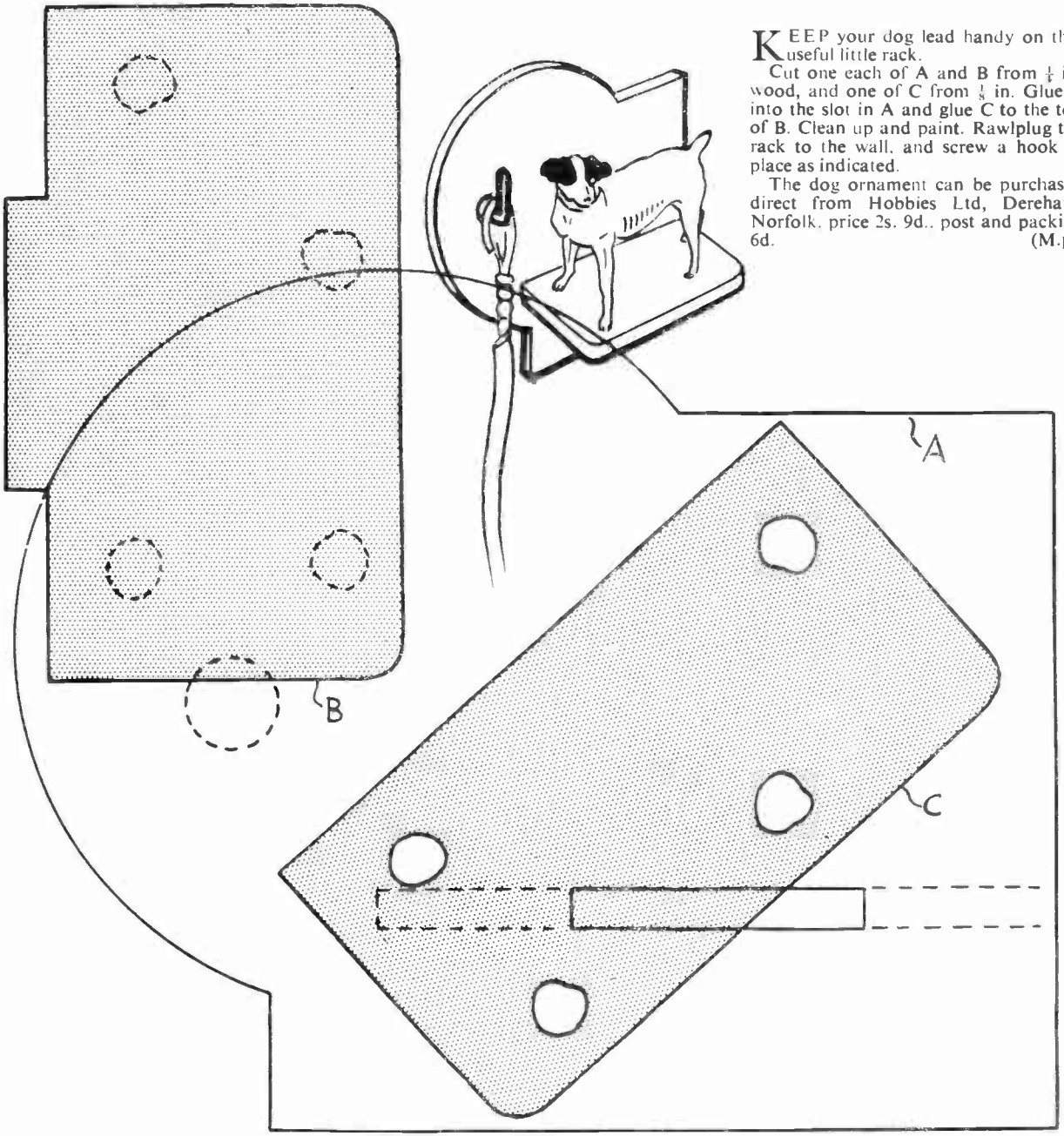
A DOG'S LEAD TIDY



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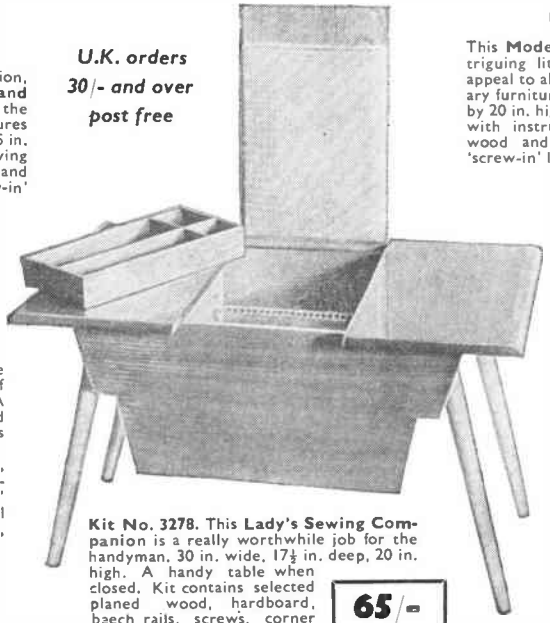

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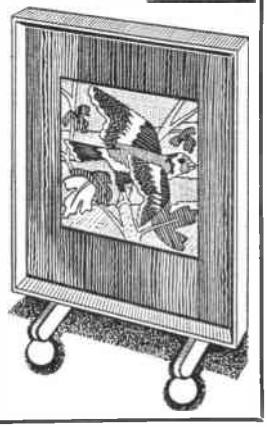

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