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THE ORIGINAL
'DO-IT-YOURSELF'
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HOBBIES *weekly*

FOR ALL
HOME CRAFTSMEN

FREE Design Supplement

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ETC. ETC.



'GUITAR' VASE HOLDER

Adds a note of distinction to the home



Up-to-the-minute ideas

Practical designs

Pleasing and profitable things to make

5^D



THE first railway signal was a tall candle, which one of the stationmasters of the Stockton and Darlington line used to place in a window when he wanted the train to stop.

When the Liverpool and Manchester line opened in 1830, the signalling was done by means of a flag by day or a lamp by night, held in the hands of the pointsman. Four years later the line was fitted with posts, on which the pointsman used to hang the lamp or flag.

Railway Themes

Three years after that, when the line had been extended to Birmingham, it was fitted with posts, on which, instead of a flag, was a disc, which could be turned end on when all was clear. Under the disc was a lamp with a red glass on one side and a white glass at right angles to it, so that the full disc and red light faced one way, and the edge of the disc and the white light faced the other.

In 1841, semaphore was introduced on the railway — first by Sir Charles Gregory at New Cross. As introduced into railway work, the semaphore had three positions. At right angles it signified 'stop', at half a right angle it meant 'go slowly', hanging down straight it showed that the line was clear. Today the semaphores have two positions only.

In 1846 distant signals were introduced. These were placed at some distance in front of other signals to warn drivers in time to pull up. They were worked with a lever like the station signals.

But an ingenious signalman found it a bore having to walk backwards and forwards between the two signals he had in his charge. So he got a piece of wire, and fixed one end on to the lever of one of the signals. He then hooked on a broken iron chain as a counterweight, and then went to the other signal and began to pull.

His idea was approved of by his superiors as saving much labour, and so were developed the wire-pulls now so familiar.

Only one side of the railway signal-arm is of importance. And that is the side to the left of the line as the train approaches. This is the side painted red. The other side is painted the same colour as the post in order to show that no notice is to be taken of it.

Do you know why some signals have square ends and some have swallow-tails? The square-ended arm is a 'home' signal. The swallow-tailed one is a 'distant' signal. A distant signal on a level road may be a thousand yards from a station. On a rising gradient it will be closer. But it will always be far enough away for an express to pull up within the distance.

Platform signals are generally 15 ft. above the rail-level.

When signals are more than 45 ft. high, there is generally another arm on the same post lower down, so as to be visible to the drivers in fogs, etc. When there are 'advanced starting' signals they are at the same height as platform signals. They are placed within 350 yds. of the signal box, so as to be visible both by the signalman and the driver of the train when at the platform.

Distant signals are always within

sight of the home signals they cover. Junction signals are within 220 yds. of the signalman when they defend 'trailing points', and 150 yds. when they defend 'facing points'.

Junctions are also defended by 'disc signals', being dwarf posts fitted with a lamp and plate of metal, with power of turning to show red or green.

All signals are fitted with a pair of spectacles. There is a green glass and a red one. And they move over a white bull's-eye lamp in such a way as to show green for clear and red for danger.

Signals are also fitted with an electrical apparatus, working a model signal in the signal-box, so that if out of sight round a corner, or in thick weather, the signalman can see how the signal stands.

In working a train the driver is informed at what time he ought to pass certain places on the line, which are not necessarily stopping stations. To keep time he has to travel at a certain speed.

Signals and points are interlocked. The signalman cannot work one independently of another.

A visit to a signal-box will show that on every lever are certain numbers, these numbers being those of the levers that are in interdependence with it. The machinery is complicated but easily understood.

Under the floor of the signal-box is a series of vibrating and sliding bars, which work in with notches on the lever in much the same way as the tumblers of a lock. And on parts of the line, out of sight of the signalman, 'detector bars' are used to stop the signals from showing 'all clear' when a train is on that portion of the line. (R.L.C.)



Illustrations of some of the latest Russian labels

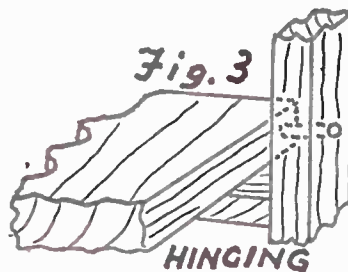
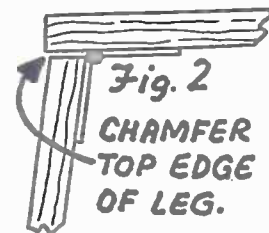
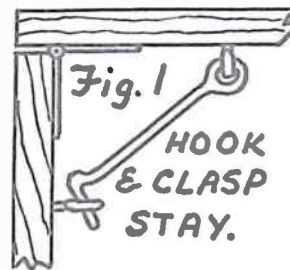


GEORGE PASTELL, noted stage and TV. actor, now starring in 'Flower Drum Song' at the Palace Theatre, London, wants a fitted cupboard that will hold all the dozen and one things used in the kitchen. This is a good idea, for there is no doubt, busy kitchens are apt to get cluttered.

By Ed. Capper

With a little pre-planning, a unit can be made to store everything; a unit simply made from chip or block board or from the conventional batten framework with a covering of hardboard.

In the drawing is shown such a unit.



Plans for A Kitchen 'Stow-all'

 ★
 ★ George Pastell, who is starring in
 ★ 'Flower Drum Song' at the Palace
 ★ Theatre, London
 ★
 ★ *****



If we follow the identification letters, we see just how useful such a cupboard can be:

A — behind-door broom holder; B — storage cupboard; C — duster bin; D — storage space; E — sleeve board; F — electric iron; G — storage cupboard; H — storage cupboard; J — storage cupboard; K — ironing board; L — vacuum cleaner cupboard (if of the cylinder type) or dirty linen cupboard; M — seat for use when ironing; N — storage cupboard; O — boot black platform.

The storage cupboards, B, D, G, H, and J can be used to accommodate detergents, soaps, furniture polishes, pegs, saucepans, etc, whilst N would, obviously, be handy for the shoe polishes and brushes. Incidentally, the boot black at O would not normally be used whilst the ironing seat was in use. It is shown only as part of the general drawing.

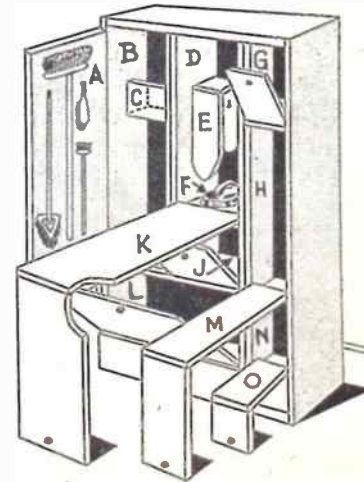
The ironing board would, of course, be padded. Three layers of old flannel-ette, topped with a conventional cloth piece, held with braid and studs, is quite sufficient. Similarly, the ironing seat could be cushioned with a length of foam rubber fixed with adhesive. Where the iron rests, just inside the cupboard, could be protected with asbestos sheet. Care must be taken to keep the electric flex away from any danger of burning from contact with the hot iron.

The ironing board, seat, and boot black platforms, are held firm when extended for use, as shown in Fig. 1, by a hook and clasp. Alternatively, the top edge of the leg piece could be slightly chamfered to allow the leg to splay outward, thus making, in itself, a non-

collapsible fixture as shown in Fig. 2. These two drawings also show how the platforms are hinged underneath to the leg pieces.

The hanging of K, M, O, and the drop-flaps for cupboards, G, J, and I can be carried out in the usual way with butt hinges, or they can swivel on an axle of steel pins driven through the side pieces, as shown in Fig. 3.

In most cases it will be found possible to build the unit right up to a wall, dispensing with back pieces of material. All the flap doors should be held closed with ball catches, as should platform and leg pieces, K, M, and O. The last three fold up and hinge back to form closed doors for cupboards, D, H, and N.



ACTI & SUCCULENTS

SUCCULENTS are plants that have become adapted to survive periods of drought. Undoubtedly the best known of these plants are the American cacti, but many other plant families have members which have become so modified that they can undergo long periods without water.

The cultivation of these plants is comparatively easy and makes a fascinating hobby. Initially most people start with a window sill collection, although they often end up by filling a greenhouse. One still hears it said that cacti live in sand and need no water. This, of course, is nonsense; they are living plants and their requirements are the same as other plants, although they are much more tolerant.

When starting a collection it is important to buy plants that will survive your naturally inexperienced efforts at cultivation and that will 'do something'. By this last I mean that the plants will flower or grow and send out branches, not just sit in their pots and sulk.

The cacti are: *Cleistocactus strausii*, *Cereus peruvianus*, *Opuntia cylindrica*, *Rebutia minuscula*, *Mammillaria bocasana* and *Chamaecereus silvestrii*.

The first three are grown for their attractive form rather than their flowers,

1—STARTING A COLLECTION

although greenhouse specimens growing in ten inch pots will flower. *Cleistocactus strausii* is popularly known as the 'silver torch' cactus. It forms a stout column, covered with silvery white bristles and is a very beautiful, free growing plant.

Cereus peruvianus is one of the *Cereus* group, of which there are many types, most of them easy to grow. This plant forms a tall column with stout spines and a beautiful blue bloom. It is quite a rapid grower. However, should it grow



Bryophyllum Tubiflorum

diameter, when older it produces a cluster of off-sets. About April or May it produces a profusion of scarlet flowers. *Mammillaria bocasana* is popularly known as a 'Powder Puff' cactus. It is a clustering plant, covered with silky white hairs. During the summer it produces rings of tiny cream coloured flowers; these are followed in the autumn by bright cerise berries. *Chamaecereus silvestrii* consists of a large number of finger-like plant bodies. In the early spring silky brown buds are formed and in summer it covers itself with large scarlet flowers.

The 'non-cactus' succulents vary greatly in form, the following six being all completely different and easy to grow. Three of them, unlike the cacti, have leaves. These are *Crassula bolusii minor*, *Haworthia tessellata*, and the *Glottiphyllum*. The *Crassula* is a small cushion-shaped plant with tiny, prettily marked leaves. During the late summer it is a mass of small pale pink flowers. *Haworthia tessellata* has thick leaves with translucent 'windows' in their tops. It bears insignificant bell-shaped flowers on ridiculously long stems, and although not beautiful, they are sweetly scented.

I have just mentioned *Glottiphyllum* without giving any species. This is because many of those sold as named

species are really hybrids. They consist of thick fleshy leaves on very short stems, so that they appear to be almost stemless. In the autumn they have large yellow flowers which superficially resemble daisies. This plant is different from the others in this article as it does not commence growth until about June. From then until about January it should be kept moist; during the rest of the year water should be withheld.

The remaining three succulents are: *Euphorbia canariensis*, *Bryophyllum tubiflorum* and *Stapelia variegata*. The *Euphorbia* is a four-sided column with short sturdy spines, and is leafless. When about fifteen inches high, it branches, giving a candelabra effect. It is a slow growing plant, and this will take some years. The *Bryophyllum* is a rapid grower and looks like a little tree. It has prettily mottled stems and cylindrical leaves, at the ends of which little plantlets are formed. These will drop off and root. In the autumn the plant, when large enough, will send up a flower spike; the flowers are orange. Once the plant has flowered it ceases to increase in length and branches. This spoils its shape and it is advisable to start again from one of the plantlets.

Stapelia variegata produces beautifully mottled, five petalled flowers. These look like starfish and smell like rotting vege-

tation! This is to attract the flies that fertilize the flowers. The plant is leafless.

All these plants may be grown in the same type of soil, the well-known John Innes No. 1 compost, with a little extra sharp sand to improve the drainage. During the summer months the cacti and other succulents should be kept damp (except the *Glottiphyllum*). Once the autumn comes the watering must be gradually reduced and during November to February once a fortnight is ample. When the lighter days of March arrive watering may be gradually increased.

All succulent plants must have the maximum light available. A South-facing window-sill during the winter is ideal. In summer the pots may be placed completely out of doors. In winter the plants like to be kept cool but above freezing. A bedroom or unused room will be better than a heated living room as this ensures that they get their winter rest. If a greenhouse is available a winter temperature of about 40°F should be aimed at.

If your plants grow as they should, they will probably need repotting annually. In any case when the pot is full of roots, it is time to move to a size larger. (P.R.C.)

Next: Some specimen decorative plants.



Chamaecereus Silvestrii



Mammillaria Bocasana

The following list contains six cacti and six African succulents belonging to other families. All these plants will grow in a room, some will flower, whilst others are grown for their attractive colour or spine formation. These latter are plants which reach a large size in their native state and never reach flowering size unless planted out in a greenhouse bed.

too tall, the top of the plant may be cut off in the spring. It should be allowed to dry for a week and then planted, when it will soon re-root.

The Prickly Pear or *Opuntia* group is very large and diverse in form. Most people are familiar with the flat padded types but the cylindrical ones have a neater habit when space is limited. *Opuntia cylindrica* is a tall green column

with tiny leaves on the new growth which fall when the growth matures. If you wish you may cut the plant off near the soil level. The base will then branch and you will have an attractive clustering plant. The top may be re-rooted as for the *Cereus* already mentioned.

The last three cacti are small, freely flowering plants. *Rebutia minuscula* is a small globular plant, about one inch in

The Triangle Puzzle

PUZZLES that at first sight appear easy to solve are very often the most difficult. Here is one of this type which will cause endless fun and puzzle your friends, yet when you know how to do it nothing could be easier.

The puzzle consists of twenty right angle triangles, the base of each being half the length of the upright. All the pieces are exactly alike.

The aim of the puzzle is to form a complete square from the twenty jumbled

up pieces. Stout card can be used, but thin plywood is easier to piece together and will stand up to wear and tear much better.

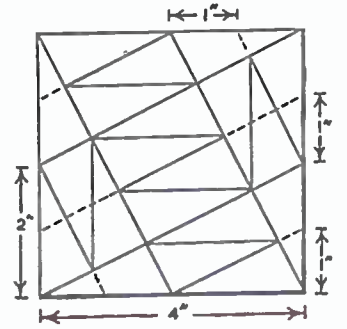
It is important to use one side of the puzzle only and therefore the top and bottom surfaces should be of different colours or have some other distinguishing marking.

The material for the puzzle, whether card or plywood, is 4 in. square and the setting out is clearly shown in the sketch. The black lines only are cut out; the dotted ones indicating setting out points.

Find the centre of each side and draw lines to respective corners to give the foundation markings of the puzzle. Dots placed 1 in. from most corners complete the setting out and it only remains to join these up to form the triangles.

Cut out with either scissors or a fine fretsaw according to the type of material used and clean up where necessary.

Packed in a neat box this puzzle would make an ideal present or be very suitable for bazaars or sales of work. With a picture glued to one face it would become a junior jig saw puzzle. (A.F.T.)



CAN WE HELP?

MR A. A. Moore of Buckleberry Westrop, Cold Ash, Newbury, Berks., was awarded first prize and a silver cup in a local show for his model of a Gypsy Caravan made from a Hobbies design. He has also completed the Stage Coach, with which he hopes to retain the Challenge Cup. Mr Moore who has taken a renewed interest in model making since his retirement, would now like to have a go at some more Hobbies designs featuring models on wheels, such as an old four-wheeler cab or a hansom cab. Unfortunately these designs are now out of print, but if any reader could help Mr Moore and get in touch with him direct, I am sure he will be fully appreciative.

MR. G. E. Beardwell of 186 Whalebone Lane South, Dagenham, Essex, is particularly anxious to obtain an old copy of Hobbies 1938 Handbook, and also the design for a Country Inn No. 204 Special. If any of our readers could help with this request, they should write direct to Mr. Beardwell.

A 'GUITAR' VASE HOLDER

THIS model of a miniature guitar gives a modern setting to a charming wall decoration which is intended to be used as a flower vase. Though conforming to the authentic shape the guitar is not, of course, playable but sufficient details are incorporated to give it a 'musical' appearance.

It hangs on the wall from a cord, and flowers are inserted in the vase container. The model overall is 12 in. high and 4½ in. wide, and the guitar itself is of solid construction.

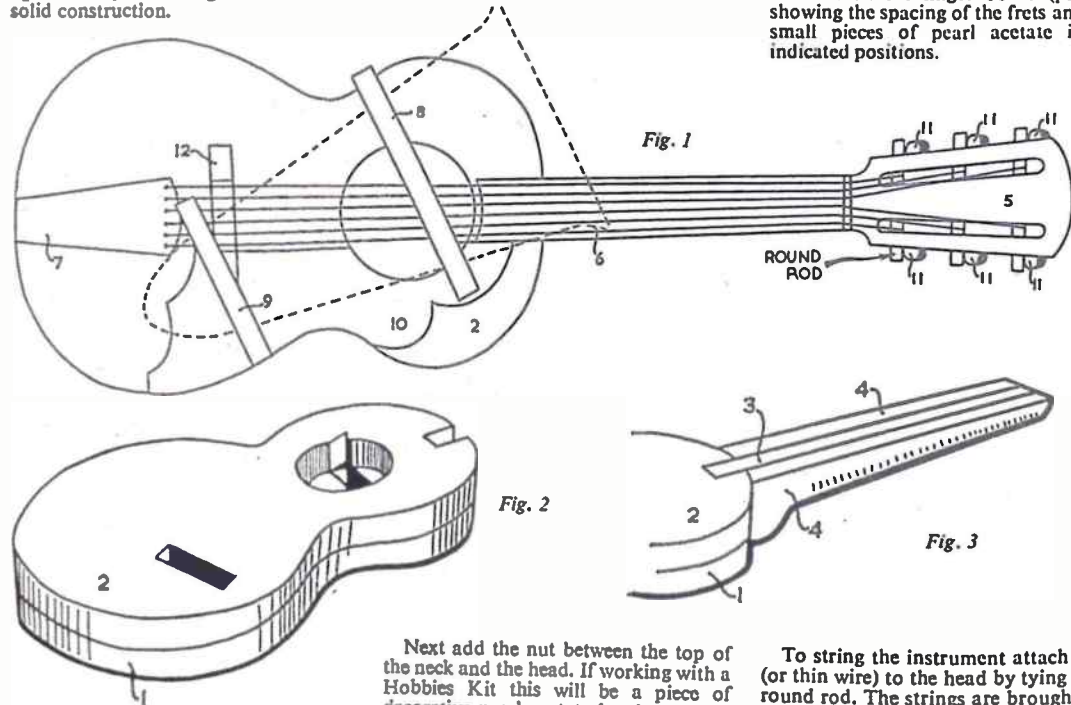
pieces 4. The tenon of piece 3 is glued into the mortise in the body piece 2, as shown in Fig. 3.

The next step is to glue the head (piece 5) to the end of the neck and at the same time glue on the finger board (piece 6). As this involves the gluing together of two end grains make sure of a strong joint between the head and neck. Coat both pieces with adhesive and allow it to harden. Then reglue before joining the two pieces together.

A KIT FOR 7/9

Hobbies Kit No. 3376 for making this Guitar Vase Holder contains panel of wood, stripwood, round rod, acetate sheet, thonging, plastic vase, etc. Kits price 7/9, from branches or from Hobbies Ltd, Dereham, Norfolk (post 1/6 extra)

Mark off the finger board (piece 6) showing the spacing of the frets and glue small pieces of pearl acetate in the indicated positions.



All the parts which go towards this model are shown full size on the design sheet together with thicknesses of wood and arrows indicating the direction of the grain of wood. Trace the parts and transfer them to their appropriate thicknesses of wood by means of carbon paper, thoroughly cleaning up each piece preparatory to assembly. See Fig. 1 to get a good idea of the relative positions of the parts.

The first step in assembly is to glue together pieces 1 and 2 as shown in Fig. 2, piece 2 being at the top.

The neck of the instrument is made up by sandwiching piece 3 between two

Next add the nut between the top of the neck and the head. If working with a Hobbies Kit this will be a piece of decorative pearl acetate but it can also be made from a piece of ordinary hardwood suitably painted. To represent the machine head of the guitar, pieces of dowel are glued in holes in the head and the keys (11) are glued alongside as shown in Fig. 4 on the design sheet.

Next put temporarily in position the rings 8 and 9 which will hold the vase. Note that piece 8 has a longer tongue than piece 9, piece 8 being glued into piece 1 of body and piece 9 into piece 2.

Shape the bridge (piece 12) to the section shown on the design sheet and glue it in the position indicated by dotted lines on piece 2. Similarly add piece 7 on piece 2.

To string the instrument attach cords (or thin wire) to the head by tying to the round rod. The strings are brought over the nut, over the bridge and then glued into piece 7. Note also that the strings will be taken through the vase holders (pieces 8 and 9). These are marked and drilled to take the strings and then glued permanently into their respective positions.

The guard (piece 10) can be added after finally decorating the instrument. This can be obtained by staining and polishing or varnishing, or it would look quite well painted.

A screw-eye is added in the neck near the head and another in the body. They are joined by a piece of cord or plastic thonging for hanging the guitar on the wall.

DECORATIVE FLOWER POTS

ORINARY earthenware plant pots are easily transformed into gay containers for indoor plants by texturing the outside with plastic paint. The material is bought in powder form and any good paint stores should be able to supply in small quantities. Plastic paint is similar to plaster in many ways and sold under several trade names, Marb-l-cote being used for this example.

The main advantage of using plastic paint — which is widely used for relief decoration — is that a surface texture is easily achieved by means of very simple tools. It is extremely tenacious and permanently bonds to earthenware pottery without any difficulty, ultimately being painted in one, two or three colours to produce charming effects.



The finished pot

Each coat must be allowed to dry before applying the next. For a tinted glaze use a transparent scumble to which linseed oil and turpentine has been added for thinning with a little red stainer to make a pink glaze. This is applied sparingly with a brush so that it fills all the crevices. Take a lintless cloth, roll into a firm ball and carefully wipe the surface of the pot. The glaze is removed from the high relief parts of the texture and remains in the crevices, producing a two tone effect.

In texturing, an old comb with fairly wide teeth may be used for producing either a rustic effect or wavy lines. If a small sponge is applied to the plastic paint while wet and given a quarter turn it will produce a swirl effect. If the



Fig. 1—Texturing with a block of wood

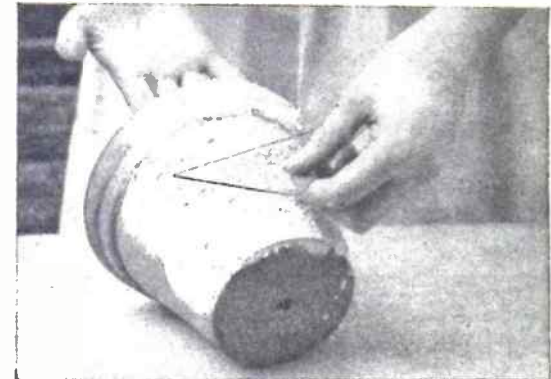


Fig. 2—Flattening the raised texture with a set square while plastic paint is still wet

A pot should be allowed to soak in clean water for a time until all the 'fire' has been quenched, and then dried. Pour some tepid water into a dish, adding the plastic paint a little at a time while stirring. Keep adding the powder until the mixture is reasonably thick but not too stiff.

The prepared paint is laid evenly on the pot with a paint brush. It is advisable to apply the material texturing immediately and I find it better to treat one half of the pot, texture and then proceed similarly with the other half, with little loss of time and before setting commences. In the example shown the lower portion was treated first and then the broad rim.

In Fig. 1 you will see the simple tool used for texturing — a small block of wood. The latter is applied to the pot,

pressed and withdrawn several times in one position. This action creates suction, lifting the paint and making very sharp irregular points. Continue until the entire pot has been so textured.

Fig. 2 shows how to use a piece of celluloid for flattening all the points of paint raised by the suction and ultimately making a lace effect. After texturing the pot is allowed to dry naturally overnight.

You will find that on drying the pot is covered with the lacy, textured paint but sharp points and loose particles can be removed with coarse glasspaper.

Plastic paint is very absorbent and you are recommended to apply at least three coats of a pale ground colour in either gloss or flat paint. Painting plays quite an important feature for the textured surface permits two or even three colour-

material is allowed to set, a little you will also find that a leaf or flower can be modelled with a sharply pointed stick. This treatment will transform an ordinary plant pot and may also be used for bulb bowls or jam jars.

(S.H.L.)

STOP THOSE BLISTERS

DOES your wife complain that the continual grasping of her sweeping broom shaft causes blisters to appear on her hand? A simple remedy is to slip a bicycle handlebar rubber grip over the end of the shaft. She will find this much softer to hold and kinder to her hands.

(F.K.)

CRYSTAL SET CIRCUITS

A CRYSTAL radio receiver can be made up with very few parts indeed, and in most localities it will give good headphone reception, when used with an earth and reasonably effective aerial. The aerial need not, always be out-of-doors, as an indoor wire is often sufficient. The earth connection is taken to any metal object in contact with the ground — a cold water pipe, earth spike, or anything similar.

Crystal sets do not need any battery or mains supplies, and the crystal detector and phones can give good service for very many years. Crystal

sold as surplus, none of the circuits will be able to give proper volume. This point is very important indeed if a crystal diode or crystal valve detector is used, because there is no means of

By 'Radio Mech.'

adjusting such a detector. With the older type of catwhisker detector the whisker can be adjusted to find a sensitive spot on the crystal.

the receiver does not need a variable tuning condenser. Instead, two coils are wired in series from aerial to earth, as shown in Fig. 1, and the coupling between these coils is adjusted, to tune the set.

So that coupling can be regulated by swinging one coil away from the other, flat 'basket' coils are most convenient. These are made by cutting two discs of strong cardboard about 3 in. to 4 in. or so in diameter, and cutting slots about 1 in. long in these, as shown in Fig. 1. There must be an odd number of slots. The coils are wound by taking the

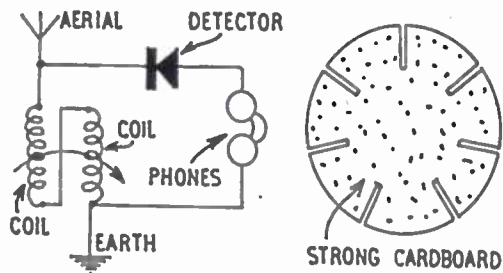


Fig. 1—Variable inductance tuning

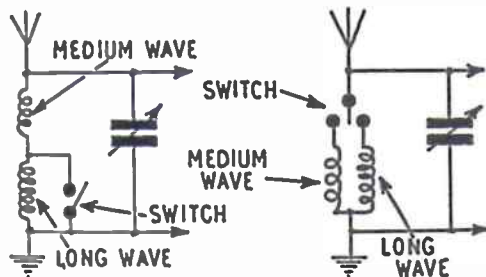


Fig. 5—Two circuits for dual-wave tuning

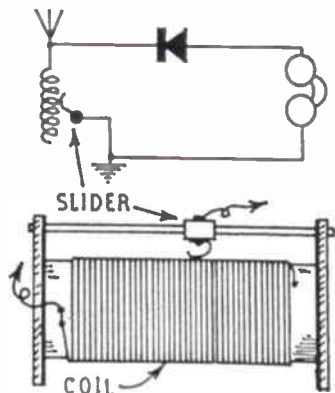


Fig. 2—Slide coil tuner

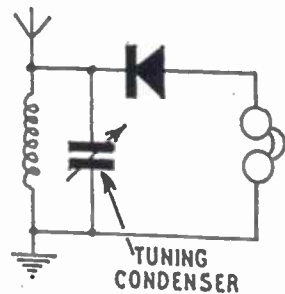


Fig. 3—Variable condenser tuning

The phones should also be of good quality. These may be surplus or ex-service items provided they are of medium or high impedance. Low impedance phones will only give poor volume, because they are intended for valve receivers and similar equipment. If necessary, two pairs of similar headphones may be worked from a crystal set.

Inductance tuning

This can give very good volume, and

wire through each slot, as it is reached. If there is an odd number of slots the wire will overlap one side, then the other, through the whole coil. At the outside, the wire is held by passing the end through one or two small holes in the cardboard.

As with the other coils described later, the gauge of wire is not very important. But very thin wire may easily break, and very thick wire takes up too much space, so that something about 28 S.W.G. is usually most convenient. The wire may be enamelled, or cotton- or silk-covered.

For most medium-wave stations,

about 45 turns on each coil will be satisfactory. It is not necessary that both coils have the same number of turns. One coil is fixed, and the other secured to a rod so that it can be swung away to reduce coupling. Reversing the connections to one coil (not both) will also change the wavelengths which can be tuned with any two coils. The actual aerial used also influences tuning. If it is necessary to tune to higher wavelengths to reach any particular station, turns should be added to the coils. On the other hand, if the set will not tune to a low enough wavelength for some station which is wanted, turns must be removed from one or both coils. This also applies to other types of coil.

Slide coil tuning

As tuning can be accomplished by varying the number of turns on the coil, a slider may be used for tuning, as shown in Fig. 2. The coil itself is wound upon a Paxolin or Bakelite tube about 1½ in. to 2 in. or so in diameter. Square pieces of thin wood or other insulating material are fixed to each end. This can be done by passing a long screwed rod right through the tube and both pieces; or by cutting wooden discs which are a tight fit inside the tube, and fixing the square ends to these.

A solid wooden former may be used instead, and the ends can then be fixed to it with panel pins.

The coil has about 150 turns, of 28 S.W.G. or similar wire. As the insulation has to be scraped away so that the slider can make contact, enamelled wire is recommended. The slider moves on a metal or insulated rod, and has a flexible lead for connecting to earth. The actual contact is of brass, bent so that it bears on the turns of the coil.

Used alone, such a coil will tune over all the medium waves. If long waves are also wanted, a minimum of about 200 turns should be put on, and a condenser of about 0.003μF to 0.005μF should be connected from aerial to earth when L.W. reception is necessary. The detector, and terminals for phones, etc., can be mounted on the square insulated ends.

Condenser tuning

When a variable condenser is used for tuning, a fixed coil can be employed, as shown in Fig. 3. For medium waves, this coil can have about 80 turns, side by side, on a 1½ in. diameter or similar insulated tube. For long waves, about 300 turns will be needed. The coil can be for M.W. only, L.W. only, or both, as described later.

The tuning condenser is about 0.005mfd. maximum capacity. Air spaced condensers give slightly better volume than the smaller, solid-dielectric type.

If the condenser is less than 0.005mfd. then stations of high wavelength cannot be tuned in, though stations of lower wavelength will be received just as well as if 0.005mfd. were used. An airspaced 0.005mfd. condenser will have about 14 fixed plates and 14 moving plates, while the small solid-dielectric condensers will have about 5 fixed plates and 5 moving plates, for 0.005mfd. Old or surplus condensers can be identified, if this is remembered. The moving set of plates must not touch the fixed plates.

The condenser is fitted with a dial or knob, and this is the tuning control of the receiver. For a crystal set, a knob with pointer is sufficient, because tuning is fairly flat, or unselective.

Sharpening tuning

When a crystal set is used fairly near a powerful BBC station (say up to 20 miles or so distance) this may spread over the tuning range, so that it interferes with other stations. To avoid this, it is necessary to sharpen tuning when such interference arises.

One method is to shorten the aerial. The shorter the wire, the sharper will tuning be. But this cannot be carried very far, or volume will be reduced too much, because the aerial will not pick up a strong signal when it is too short.

Another system is to take the aerial to a tapping on the tuning coil, as shown at 'A' in Fig. 4. The nearer this tapping is to earth, the sharper will tuning become. But volume will also be reduced, so a tapping about one-quarter to one-half the total number of turns up the coil will usually be best. Several small tapping loops can be made on the coil, and the aerial tried on each in turn.

At 'B' a condenser is added between aerial and receiver. Its capacity should be about 0.001mfd. to 0.003mfd. An old variable condenser can be used here, and adjusted for best results. Very small capacities, such as 0.001mfd. and less, will tend to reduce volume rather badly.

The last method, shown at 'C', has an aerial coupling winding. This has about one-half the number of turns which are present on the tuned winding of the coil. Selectivity (sharpness of tuning) can be increased by reducing the number of turns on the aerial coupling winding, or moving this winding farther away from the tuned winding.

All these systems reduce volume somewhat, but the overall improvement, due to sharper tuning, will often be worth while. When maximum possible volume is necessary or a very short aerial is used, there will be no need for the aerial connections shown in Fig. 4.

Dual-wave tuning

In some parts of the country it is necessary to tune long waves, to get the

Light Programme. As the Home Services are not broadcast on long waves, it is then best to use a circuit which will tune both L.W. and M.W.

Two ways of arranging this are shown in Fig. 5. The first has a dual-wave coil. This has M.W. and L.W. sections in series, and a switch short-circuits the L.W. section for M.W. tuning.

Such a coil can be wound on an insulated tube about 1½ in. or so in diameter and 3 in. or so long. The medium-wave section can have about 80 turns, as already described. An aerial tapping can be made at about 40 turns. A clear space of about ½ in. is then left, after the M.W. winding is completed, and the L.W. winding is put on. This can have roughly 300 turns, and can be wound in two compact piles, with about 150 turns in each. (The tube will be too short to take 300 turns side by side.)

Make sure that all the turns throughout the coil are wound on in the same direction—especially that the M.W. and L.W. sections are wound the same way. The switch is simply closed for M.W. tuning, and opened for L.W. tuning.

Another method is also shown in Fig. 5. This has two quite separate coils. One is wound for M.W., and the other for L.W., and a two-way switch connects either coil, as required. This method is generally considered to give slightly better efficiency than obtained from the dual-wave coil. However, such dual-wave coils are often used, and give good results.

The circuit with two-way switch is particularly convenient if a miniature or other ready-made M.W. coil is to hand, and is to be used. It is then only necessary to obtain, or wind, a separate coil for L.W. reception.

Details for building one-valve radios will be given in next week's issue. Also other exciting and useful projects for the modeller and handyman.

MAKE SURE OF YOUR COPY

receiver circuits are so simple that wrong connections are unlikely. But if mistakes of this kind are made, nothing will be damaged. Instead, the set will simply fail to work properly until the error is corrected.

It is wise to obtain a good detector, because if this is a manufacturer's reject,

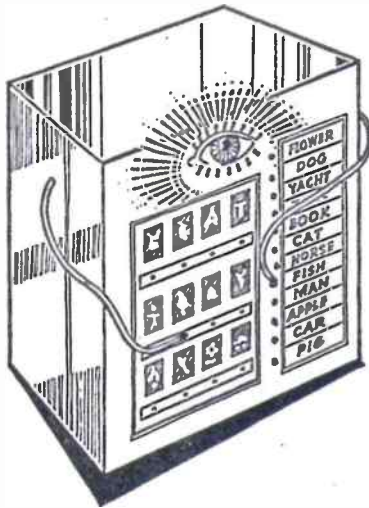
MAKE THIS QUIZ MACHINE

YOU need not be a master electrician in order to build an imposing quiz machine which will provide great fun in the family circle and at party time. A flashlamp bulb and bulb holder, a 4½ volt flat battery, some paper fasteners, and scraps of thin insulated copper wire will be needed, in addition to a large cardboard box. An ideal size for the box will be 20 in. by 15 in. by 5 in. This may be a shirt box obtainable at a draper's shop, or you can make up your own cabinet, using stout manilla board or plywood. We will assume that you have obtained a shirt box of the dimensions suggested. Now, proceed as follows.

Begin by preparing a 10 in. by 8 in. card, upon which a dozen picture cards may be glued in three rows above ¼ in. wide slots. The colourful bird and flower picture cards given away with certain brands of tea will be very suitable because, as a rule, the titles of the pictures are not printed beneath them. Cut out the slotted card, as illustrated in Fig. 1, using a metal ruler and a sharp penknife. The blank spaces for the cards above the slots should each measure 8 in. by 2½ in. Prepare a second card measuring 12 in. by 3 in. to serve as an 'answers' strip, and divide this into twelve equal horizontal spaces by means of a pen and ruler.

Twelve pictures

Stand up the box, on end, as shown in the main illustration, and secure the questions and answers cards to the outside of the bottom of the box with paper fasteners. Place the picture 'question' card to the left and fix the answers strip, like a margin, down the right hand side. Glue twelve pictures, evenly spaced, above the three slots upon the question card. Fix a paper fastener through the



cardboard cabinet beneath each picture, within the various slots. Also, fix paper fasteners to the left of the answers card, beside each of the twelve spaces. Write the twelve titles of the pictures in a jumbled order upon the answer strip.

Turn the box around. Next you must join up the backs of the fasteners beneath the pictures to the fasteners beside the appropriate titles, using lengths of insulated copper wire. Do not forget to bare the ends of the wires, by scraping away the covering, before making your connections by twisting the ends of the wires

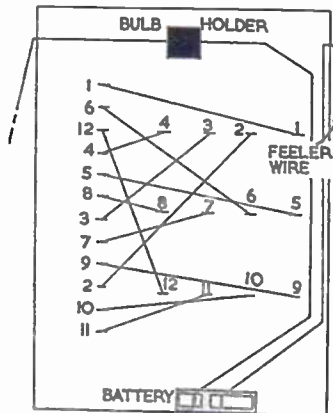


Fig. 2

on to the backs of the various fasteners. Fig. 3 will make this procedure quite clear to you. Bore a hole in the middle near the top of your cabinet, into which a flashlamp bulb may be tightly fixed. Secure the bulb in position by screwing it into a bulb holder placed inside the box.

Final wiring

Make a small hole on each side of your cabinet, near the top. Secure a 4½ volt flat battery inside the base of your cabinet with strips of Sellotape. You are now ready to commence the final wiring of your quiz machine. Join up one contact of the bulb holder to the battery with copper wire. Connect the other screw of the bulb holder to a 20 in. length of copper wire, which you must thread through one of the holes in the side of the cabinet. Connect a 30 in. length of copper wire to the other terminal of the battery and thread this wire through the hole in the other side of the box. These long wires will be the 'feeler' wires of the machine.

Now, when you touch one of the two feeler wires against a contact beneath one of the pictures and press the other wire to the contact beside the correct title of the picture, an electric circuit will be completed, and the flashlamp bulb will verify your selection by lighting up. It will be obvious that each question and answer pair will cause a circuit to be completed, and the light to flash whenever the proper contacts are touched by the feeler wires. If coloured plastic-covered wire is used to make the feeler wires the appearance of your machine will be considerably enhanced.

Useful for clubs

The cabinet should be painted black. If you use a cardboard box you can strengthen it by securing dowel rods at the back, using nails or tacks. When in use the 'lid' of the box can be placed on the back and held in place with strips of Sellotape. It is fun to glue a large bright eye, cut from a magazine, where the flashlamp bulb can be screwed through a hole in its centre. Note that the arrangement described will make it possible to fix new sets of questions and answers to your machine. If you prefer, questions may be typed upon the large cards, or you can write out little mathematical problems there. Teachers and Club Leaders will find purposeful uses for the machine, and those concerned with the raising of funds for charity may profitably adapt the idea to their requirements.

(A.E.W.)

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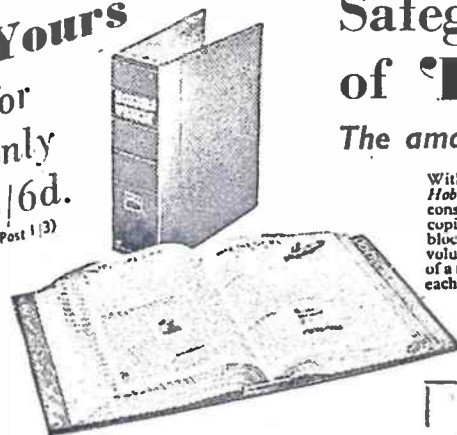
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A KALEIDOSCOPIIC THEATRE

THE kaleidoscope was one of the most popular inventions of the last century and in its many forms has continued to provide pleasure to young and old. Basically, the kaleidoscope is a triangular tube consisting of three mirrors in which an infinite variety of patterns, formed from the repeated reflections of a few haphazardly arranged objects can be seen. Two disadvantages of conventionally made kaleidoscopes are that the patterns can only be viewed by one observer at a time, and that a design of particular beauty cannot easily be repeated.

A kaleidoscopic theatre will overcome both of these disadvantages and will permit adjustment of the angle between its two mirrors, thus enabling patterns of varying complexity to be seen. Furthermore, patterns composed of coloured paint spots, cut paper shapes or figures and decorative objects drawn in Indian ink may all be represented upon a continuous paper band, to produce a fascinating sequence of designs when the strip is moved beneath the mirrors.

Select a strong cardboard box, with a separate lid, measuring approximately 9 in. by 5 in. by 4 in. Such a box can usually be obtained from a draper's shop.

Bore holes near each end of the box, about 1 in. from the bottom, through which spindles, cut from $\frac{1}{2}$ in. diameter dowel, can be loosely inserted. A cork borer will do this neatly.

Make the two spindles about $\frac{3}{4}$ in. longer than the width of the box. Cut four $\frac{1}{2}$ in. thick slices of cork, 1 in. in diameter, and bore holes through the centres of these, so that they can be fitted tightly upon the ends of the dowel spindles. Bore holes near the edges of two cork slices, into which 1 in. long stubs of $\frac{1}{2}$ in. diameter dowel may be firmly inserted, to form miniature handles. The completed parts of the two spindle units may now be roughly assembled, as illustrated in Fig. 1.

Figs. 2 and 3 will show how the two spindles must be mounted in the box. Make sure that both the handles are on the same side, and then glue the cork and dowel parts together. Balsa cement is a suitable quick-setting adhesive. Cut two dowel rods equal in length to the width of the box and fix these in place, near the top of the box, 2 in. from each end, using drawing pins. The rods will enable the paper band to move across,

flush with the lid of the box, when the kaleidoscope is finished, and will also serve to strengthen the apparatus. Fig. 3 clearly indicates the positions of the rods.

Mark out and cut away a large aperture in the box lid, rather resembling a wide church window, as shown in Fig. 2.

Form a holder and support for the two mirrors by hinging together two pieces of stout cardboard, measuring 3 in. by 5 in., using Sellotape. A pair of 2 in. by 3 in. mirrors, such as ladies carry in their handbags, may be held fast within the holder, using paper clips. This arrangement will make it possible for you to adjust the mirrors at any angle to each other, whilst their inner edges may be pressed firmly together (see Figs. 2 and 4).

The paper band, which will be housed within the box, is formed by gluing together $3\frac{1}{2}$ in. wide strips of white drawing paper, to form a strip which may be 8 ft. or more in length.

Now comes the most exciting part of the whole project, which is the decoration of the paper band. Use your imagination freely. Random splashes and daubs of brightly coloured poster paints will provide lovely effects. Fantastic ink 'doodles' will also prove successful, as will weirdly tattooed 'cartoon' figures, strange insects and fantastic monsters. Pieces cut out of magazine pictures, such as eyes, faces, flowers, shoes, exotic birds or machinery, will produce bizarre effects and symmetrical designs of incredible beauty.

Fasten the ends of the bands to the spindles, using Sellotape, and 'wind' on the paper band. Place the lid upon the box and stand the mirror holder across the hole in the lid in such a manner that the mirrors are set at 60° to each other (see Fig. 2). Now look into the mirrors and cause the band to pass beneath them, by slowly turning one of the handles. A diorama of perfectly balanced patterns will appear to grow and dissolve. There will be 'explosions' of bright colours as the inked designs give way to patches of paint, and you will be able to stop the band whenever you wish, in order to pause and inspect any especially lovely effect. Youngsters will love the flowing procession of brilliant colours and forms, and older persons will marvel at the ever changing variety of patterns in your kaleidoscopic theatre.

A more substantial theatre can, of course, be made from plywood and using slices of dowel rod in place of the corks.

(A.E.W.)



Fig. 1

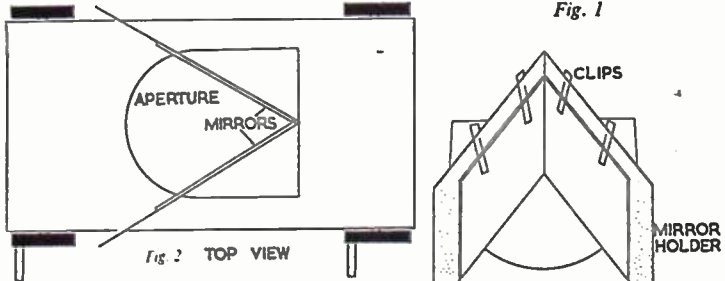


Fig. 2 TOP VIEW

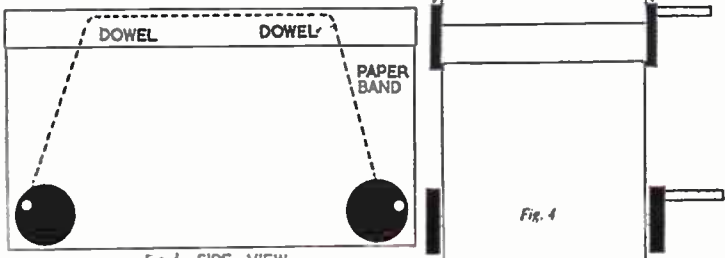
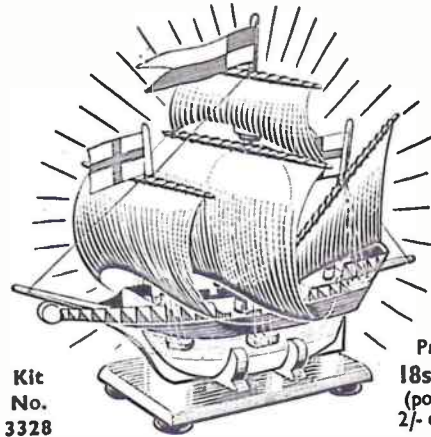


Fig. 3

Fig. 3 SIDE VIEW

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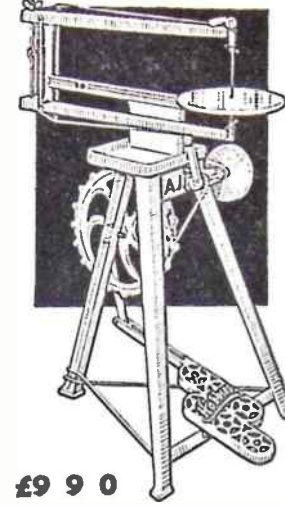
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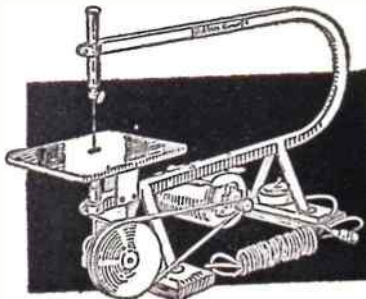
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LOG LORE

DESPITE all the excellent modern household heating fuels, what is more cheerful on a cold day than a blazing log fire? To ensure a good supply of wood fuel the time to start collecting is now, bearing in mind when logging that the wood should be selected with care. Ideally, logs should be neither too green nor too rotten.

As each varying grade of fuel gives a varying result, so it is with logs. Each different wood burns in a different manner, so before collecting the wood pile it is as well to know just how each kind will act as fuel.

ALDER. — Easy to saw and burns brightly but very rapidly, giving little heat.

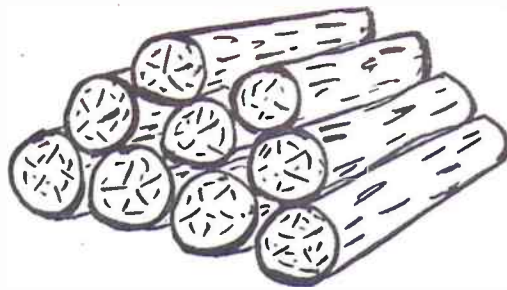
APPLE. — Moderate burning speed with a uniform heat.

ASH. — Gives a sweeping blaze and lively flame. Is almost the only wood to burn well when still green.

BEECH. — Soon ignites, so fine for kindling. While burning gives a delicate aroma.

BIRCH. — Not a good fuel. Burns too quickly and leaves a sticky solution in the chimney.

By J. A.
Chalk



CEDAR. — Is long-lasting and burns with a wonderful fragrance.

CHERRY. — Gives a sweet smell while burning and, being a hard wood, burns slowly with a fair heat.

CONIFERS. — Fire guard is a necessity, for while they burn extremely well with glorious hues they noisily spit out.

ELM. — Usually smoulders rather than burns. Even when well weathered gives far more smoke than heat.

FIR CONES. — When dry they make perfect firelighters and have a delightful smell.

HORSE CHESTNUT. — A slow smoky fuel with little heat as compensation.

OAK. — An outstanding fuel, giving

out the greatest heat and lasting longer than others. Also, the flames are bright and colourful.

PEAR. — Quite a steady heat while burning slowly.

PINE NEEDLES. — Another cheap and efficient firelighter.

RAILWAY SLEEPERS. — Burn fiercely with great heat but dangerous without a fire guard.

ROAD BLOCKS. — Burn extremely well, but the embedded gravel 'spits' badly.

SEAWEED. — Needs patience, as very smoky, but burns surprisingly well.

WOODS FROM SEA. — All woods, once impregnated with sea salt, burn splendidly when thoroughly dry.

MAKING A HOBBIES SCRAPBOOK

SCRAPBOOKS of articles from *Hobbies Weekly* are almost worth their weight in gold to the busy craftworker, keen photographer or enthusiastic collector, etc. Hours of thumbing through back copies are saved and in that form the very useful material obtained week by week has a greater significance.

It's easy — buy two copies of *Hobbies* every week instead of one. This gives you a duplicate of everything and saves 'broken pieces' when clippings are finally pasted up. Never mind the extra cost — you will think it very much worthwhile when the idea really gets you.

Ordinary scrap-books are used, which can be bought for a few coppers each. There is one difference . . . everything is not put into one scrapbook, otherwise it would be a mere hotch-potch. You specialize in making a different scrapbook for each subject. For example, you may have one on 'Photography', 'Fishing', 'Useful Toys to make', 'Tricks for the Party', 'Garden', 'Radio', or 'Painting' according to your aim. It really is amazing what new meaning is breathed into, say, 'Lamps and Lampshades' when all the cuttings are neatly arranged

in one book, and if you are in a hurry, you can pick out which one you want to make in a jiffy.

Obviously you will not be interested in every subject and, generally speaking, six or seven scrapbooks will be ample to cover your particular choice. If a subject is likely to be wider than most others, it is advisable to get a thicker scrap-book. Cut the clipping as near the print as possible to save space, and leave a blank space on the inside cover for any page indexing.

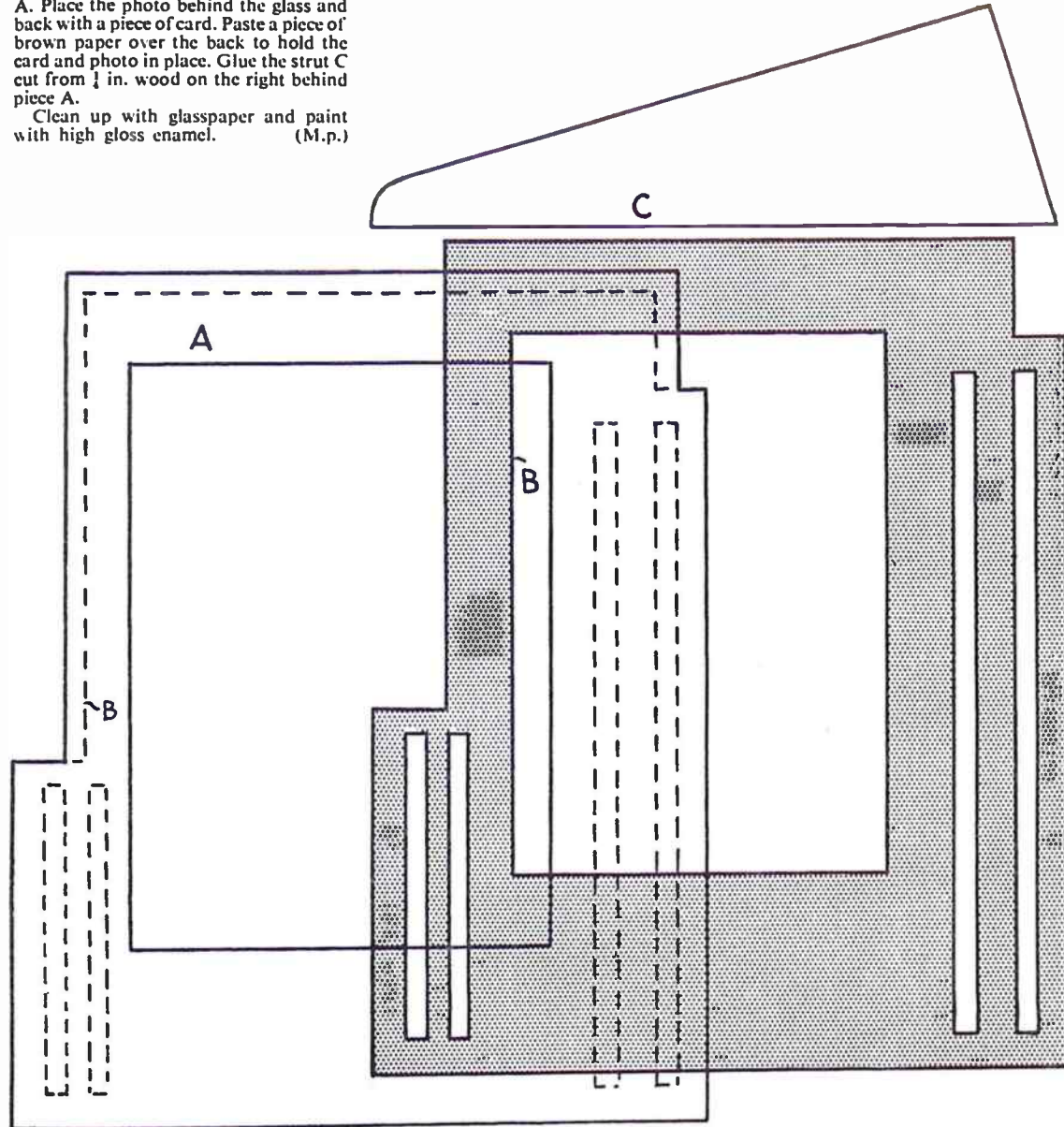
The advantages of this method are many. It is a neat filing system, it helps you to keep the 'cream' while disposing of unwanted material, and gives you an easy-to-read reference book on your favourite subject — certainly a very fine textbook which you could never buy ready bound.

The foregoing suggestions are for readers who wish to concentrate on one or two particular subjects. Many of our readers, of course, prefer to maintain a valuable library of their *Hobbies* magazines by having them bound complete in volumes. There is no easier way of doing this than by the Easibinder, particulars of which are given on page 371. (W.A.)

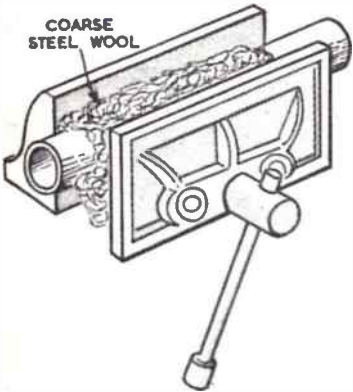
A MODERN PHOTO FRAME

CUT one of A from $\frac{1}{2}$ in. wood and one of B from $\frac{1}{4}$ in. Glue B to the front of A in the position shown by the dotted lines on piece A. Cut a piece of glass to fit the opening in A. Place the photo behind the glass and back with a piece of card. Paste a piece of brown paper over the back to hold the card and photo in place. Glue the strut C cut from $\frac{1}{2}$ in. wood on the right behind piece A.

Clean up with glasspaper and paint with high gloss enamel. (M.p.)



375



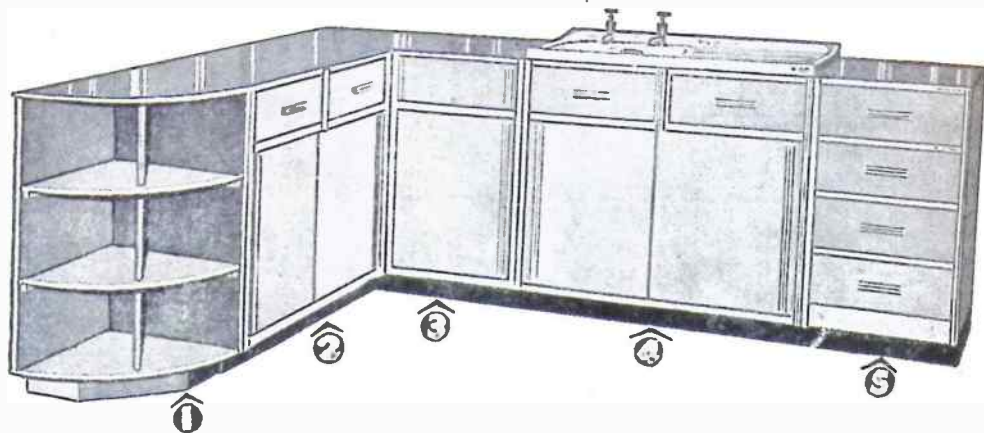
PADS FOR GRIPPING IRREGULAR SHAPES

AN ordinary vice may be used to grip rounded mouldings, dowels or pipes without damage if they are placed between pads of coarse steel wool. Place one pad on each side of the work to be gripped and tighten up. Considerable pressure can then be applied. (M.h)



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Complete £8 15s. 0d. (part p. & p. 10/6 extra) (Easy Payments £2 down (plus 10/6 part p. & p.) and 6 monthly payments of £1 3s. 11d.) Kit £6 19s. 6d. (part p. & p. 7/- extra)

3 CORNER UNIT — No. 54

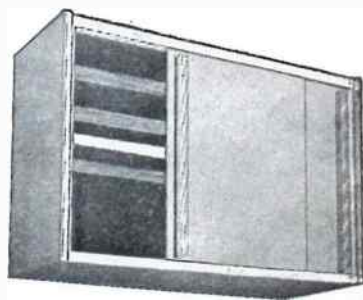
Complete £8 13s. 6d. (part p. & p. 10/6 extra) (Easy Payments £2 down (plus 10/6 part p. & p.) and 6 monthly payments of £1 3s. 8d.) Kit £6 18s. 0d. (part p. & p. 7/- extra)

4 SINK UNIT — No. 55 (without sink and taps)

Complete £6 15s. 0d. (part p. & p. 10/6 extra) (Easy Payments £1 15s. 0d. down (plus 10/6 part p. & p.) and 6 monthly payments of 17s. 9d.) Kit £5 10s. 0d. (part p. & p. 7/- extra)

5 DRAWER UNIT — No. 52

Complete £8 14s. 6d. (part p. & p. 10/6 extra) (Easy Payments £2 down (plus 10/6 part p. & p.) and 6 monthly payments of £1 3s. 10d.) Kit £6 19s. 0d. (part p. & p. 7/- extra)



WALL UNIT (to match)

No. 53 (36" x 23" x 12") Complete £4 10s. 0d. Kit £3 5s. 0d.

No. 56 (36" x 17" x 8") Complete £3 12s. 6d. Kit £2 12s. 6d. (part p. & p. unit 7/6, kit 5/-)

EASY PAYMENT TERMS

The attractive easy payment terms quoted apply to COMPLETED Kitchen Units valued at £5 and over and are subject to completion of a simple form of agreement. Send the deposit mentioned (plus part carriage and packing charge) to Hobbies Ltd (Dept. 99), Dereham, Norfolk. An agreement form for you to fill in will then be sent.

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