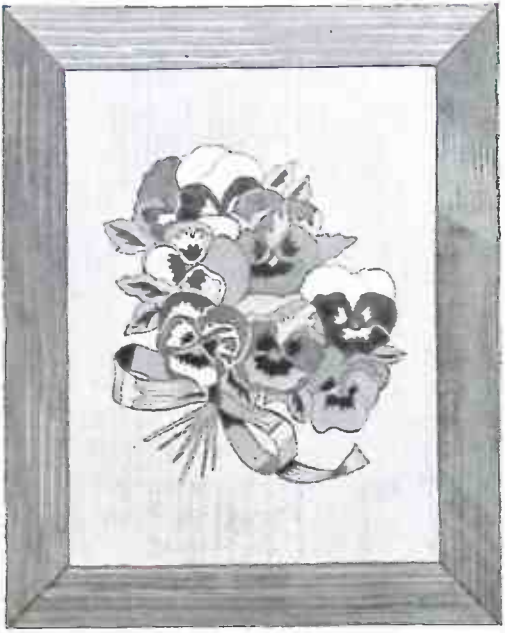
13th JULY 1960 VOL. 130 NUMBER 3370

THE ORIGINAL 'DO-IT-YOURSELF' MAGAZINE

HOBBIES weekly

FOR ALL HOME CRAFTSMEN

FREE plan for making . . .



'PANSIES'

A delightful picture in coloured woods

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5D

IN five years, 13-year-old Suzanne Rose Lovett of La Rue, Ohio, U.S. America, has obtained the autographs and favourite quotations of over 2,000 world-famous people, simply by writing and asking for them. This hobby makes an interesting sideline to autograph collecting.

Suzanne's collection has won over fifty blue ribbons and eight trophies in hobby shows.

Her contributions include:
Sir Anthony Eden: 'Never stop a job until you finish it'. President Eisenhower: 'The fear of the Lord is the beginning of Knowledge'. (Proverbs 1:7). Joe E. Brown: 'The family that prays together, stays together'. Bob Hope: 'Not everything that is allowed is honest'. Sam Snead: 'Do your best at all times, because that's the only way to be a winner'. Cecil B. De Mille: 'The greatest truths may be found in the Bible'. Lionel Barrymore: 'A good reputation is more valuable than gold'. Jack Dempsey: 'Live clean, work hard, get all the education you can — and live to be a good citizen'.

Collectors throughout the world are now collecting the words the famous live by.

Several interesting sidelines suggest themselves here. An hotel label collector could collect the autographs of hotel managers.

A meadophologist — autographs of pub landlords.

A phillumenist — autographs of match label manufacturers, etc.

LOOKING FOR 'PIPS'

James Palin collects playing cards. He is looking for cards with unusual 'pips'. He lives at 26 Robinson Avenue, Greenock, Renfrewshire, Scotland.

Russian matchbox covers

THE first two known clock-makers of the Black Forest were Simon Dibyer (or Dilger), and Frank Ketterer. Both were born in about the year 1675.

Friedrich Dibyer, the son of Simon, continued in the craft and went to Paris to learn the craft at first-hand in the French centre. He returned to Germany and established himself with a shop in St. Georges, a village in the Black Forest.

The names of several other clock-makers who worked after 1720 are also known. There was Christian Wehrle, for instance, of Simonswald, who first introduced the pendulum in Black

CLOCKS—2

Forest clocks in 1735. In the earliest examples, the pendulum was attached directly to the verge without a crutch, and arranged to swing in front of the dial. It consisted of a thin iron rod with a small bob and was called a 'Kuhschwanz Pendel' or a 'Cow tail' pendulum. The use of the pendulum with crutch came later, and was adopted gradually.

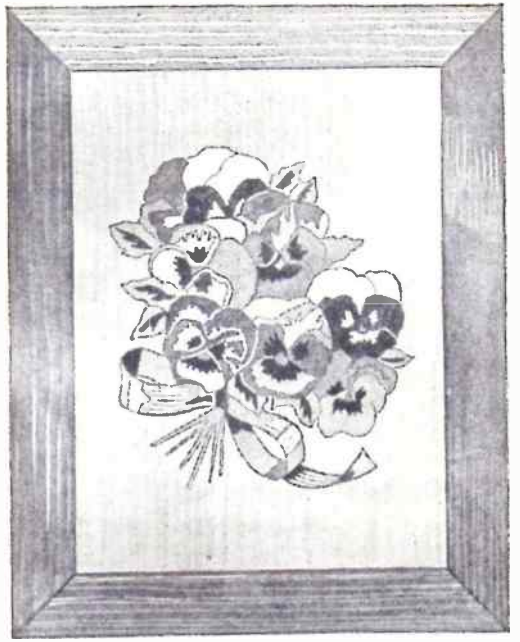
The clocks of the earlier period marked the hours only, with a single hand. The minute hand was added, for the first time, late in the eighteenth century. However, after the introduction of the pendulum, a small quarter hour dial with minute hand was added to the front plate and placed below the dial.

Some of the earlier clocks were fitted with an alarm, but it was of the crudest form of construction. The central part of the dial was carved out, leaving only an hour ring, and exposing the wheel to which the hour hand was attached. To this was added a ring having twelve holes drilled into it. The alarm was set by placing a little wooden pin into the appropriate hole. To provide a half hour setting, the number of holes would be doubled to twenty-four occasionally. The alarm was indicated at first by a single stroke, or it continued striking until the detent slipped off the pin. Often it was arranged that the alarm struck until the weight ran down completely.

The striking of quarters is found in Black Forest clocks of the second half of the eighteenth century, not before. Quarter striking was ordinarily accomplished with three trains having three weights. Another form which came into use in what were known locally as 'surrer' clocks utilized only two trains and weights. These, however, were limited to twelve-hour clocks only.

In coloured woods

Marquetry Picture 'Pansies'



THERE are many colours which cannot, of course, be exactly produced in marquetry pictures when using only natural wood veneers. Our picture 'Pansies', however, lends itself to the use of artificially dyed veneers which give a magnificent range of colour so necessary for this particular floral subject. Though this is a step away from the accepted marquetry picture made from natural veneers, we think the greater variety and authenticity of colouring will more than satisfy the worker.

The completed picture measures 10 in. by 8 in. and is intended for hanging on a wall. Alternatively, with the addition of a strut at the back, it would look very attractive standing on the sideboard. Our black and white illustration cannot, of course, do full justice to the lovely tones which are incorporated in this picture. As enumerated in detail on the design sheet, ten colourful veneers are used, including blues, reds, greens, etc, and workers will appreciate that a greater variety in tones and shading can also be given by changing the direction of the grain of the veneers, such as, for instance, where two pinks adjoin.

Hobbies kit for making the picture consists of a plywood baseboard 10 in. by 8 in., and also a light oak veneer of the same size, which forms the background to the picture. Also included are all the coloured veneers, and veneers for adding the border frame.

It will be noted on the design sheet that in a few instances a particular colour has not been designated. This is because there is not enough room for indication and workers will use their own discretion of colours for such spaces by using veneers in contrast with the adjoining pieces.

Make a start by gluing the light oak veneer to fully cover the ¼in. baseboard. Spread the adhesive evenly on the back of the veneer, using a straight piece of wood if necessary to ensure that the veneer will lie entirely flat. Press it down on to the baseboard and weight with heavy objects, such as books, until thoroughly dry.

Now it is necessary to transfer all the details of the picture, including the border veneers, on to the light oak background. To do this, align the picture on the design sheet on to the wood, insert a sheet of carbon paper in between, and with a sharp-pointed pencil trace all the details through to the wood. In tracing round the individual pieces do not mutilate the design sheet, as this will be required later on for transferring the individual shapes to the veneers.

You can now commence adding the veneers, working from the top of the flowers. From the guide sheet, trace the outline of the pink petal on to its appropriate veneer and cut out the shape with a sharp knife. Position this pink petal shape where it is outlined on the light oak, and using it as a template, cut cleanly all round through the background to the baseboard.

Place the pink petal veneer on one side and prise up the cut shape from the light oak veneer. When doing this it is not advisable to use the sharp point of the modelling knife, as the blade tips have a tendency to break off, and they need to be kept in perfect condition for cutting. It will be found that an ordinary penknife is quite satisfactory for prising up the unwanted portion of light oak veneer. In its place glue the pink petal shape, which should be an exact fit. Press down well with the fingers, especially making sure that the veneer does not lift at the corners.

Carry on in like manner with adjoining pieces, cutting out the coloured veneers as indicated, and using them as templates each time before removing the light oak shape.

When working with extra small shapes it may be found difficult to hold them exactly in place with the fingers while using them as templates. It is then a good idea to secure the coloured veneer to the background with Sellotape, as this holds it in position while cutting is in progress.

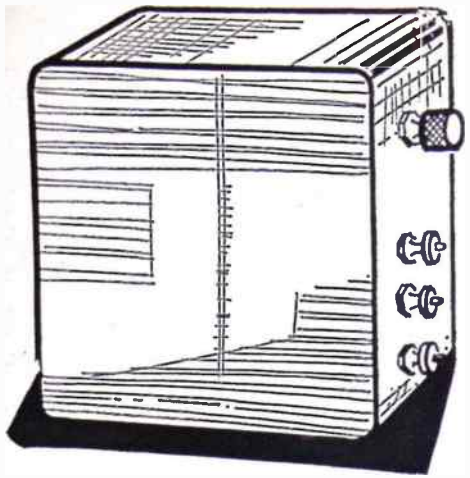
When all the floral pieces have been inserted, the border veneers can be added in a like manner. They are shown full size on the design sheet and are mitred at the corners after removing the correct portion of light oak veneer background.

Although when working it is advisable to ensure that each veneer is as flat as possible and perfectly adhered to the baseboard, the finished picture will, of necessity, be a bit 'bumpy' and uneven. To obtain an even surface when the glue is thoroughly dried, it is essential to scrape and glasspaper.

When as flat a surface as possible has been obtained, the picture is ready for polishing. Apply white wax polish with the finger tips, rubbing well into the veneers. Then go over lightly with a duster and give a rub down with a fine grade glasspaper. Repeat this process of wax polish and glasspaper until such time as a high gloss finish is obtained. Remember that the more work you put into this operation, the better and more lasting will be the finish.

★★★★★★★★★★★★★★★★
★ Hobbies Kit No. 3370 for making ★
★ this colourful picture in wood con- ★
★ tains plywood baseboard and all ★
★ veneers, including a colour pack. ★
★ Kits cost only 9/9 from branches, ★
★ etc., or from Hobbies Ltd., Dere- ★
★ ham, Norfolk (post 1/6 extra) ★
★★★★★★★★★★★★★★★★

A MINIATURE 1-TRANSISTOR



By 'Radio Mech'

COMPONENTS

Red Spot transistor; 5/-, Henry's Radio, 5 Harrow Road, Paddington, W.2.
Single winding M.W. coil; 4/-, Osmor Radio, 418 Brighton Road, South Croydon, Surrey.
Crystal diode; 3/6 | Lasky's Radio, 370
500pF padder; 2/6 | Harrow Road, London, W.9.

THE containing case for the receiver is made first, and has to be approximately 2 in. by 2 in. by ¾ in. deep inside. If wood ⅛ in. thick is used, two pieces should be cut 2 in. by ¾ in., and two 2¾ in. by ¾ in. These can then be joined with small pins, and glue, so that the case is 2 in. by 2 in. inside. The front and back of the case are both 2¾ in. by 2¾ in., and can be of ⅛ in. thick material such as Paxolin, though wood is also perfectly satisfactory. The back is permanently fixed with adhesive and pins. The front, however, is attached by four small screws only, so that it can be removed to replace the battery.

The case should be glasspapered and varnished before wiring up the receiver. Attempts to use a tin box, or make a case with any metal parts, are not recommended, because of the danger of short circuits.

Parts needed

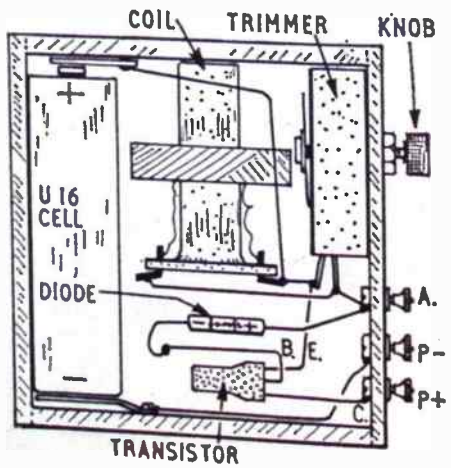
A single 1½V. U16 cell provides current for the receiver, and this fits a case of the size mentioned. Any other single dry cell will give the same results, but the dimensions of the case will have to be changed to suit. With the circuit employed, there is little point in fitting a battery of higher voltage. Nor is a large cell worth while, because the single small cell will last for some months, with normal use.

The tuning coil covers medium waves (about 200 to 550 metres) and is given in the component list. Other coils can be used, but may need a larger case. For a home wound coil, about 80 turns of thin insulated wire (say, about 34 S.W.G.) wound in a pile about ¼ in. in diameter, and resting flat in the case, can be tried. Efficiency will be slightly less than with the ready-made coil, but sufficient volume will often be obtained. If a home wound coil of maximum efficiency is to be made, a former with iron dust core should be used, and the winding should be of 7/48 or similar Litz wire. Very careful soldering will then be needed at the ends of the winding, because each of the seven individually insulated strands of the wire must be cleaned and soldered to the others, without breaking. For this reason, a ready-made coil, or home wound coil of single strand wire, is recommended.

The tuning condenser is a 500pF trimmer or padder. This has a screw for adjustment by means of a screwdriver. As this is not very convenient, a longer 6 B.A. bolt should be substituted, so that it projects outside the case. A small insulated knob is secured to this screw by means of locknuts. An insulated terminal head, small screw cap, or anything similar, will do for this knob.

Any crystal diode, in good condition, will be satisfactory. The circuit is intended for a cheap 'Red Spot' transistor, which is best with the arrangement adopted. If both diode and transistor are in good condition, really good headphone volume can be expected.

Three small 6 B.A. bolts, with nuts and terminal heads, provide connecting points for phones, aerial, and earth (if used). No on/off switch is fitted because the circuit is so arranged that the battery is switched off by disconnecting the phones.



Wiring up

All connections can be made from thin copper wire such as might be used for winding the coil. Or thin bell wire is easy to use. Short lengths of insulation can be stripped from this type of wire, and slipped over the transistor and diode leads, to prevent short circuits.

The battery fits between two flat pieces of metal screwed to the case, as in Fig. 1. Very short screws are needed here. The outer zinc case of the battery is negative, and the battery must never be put into the receiver the wrong way round. After fitting the battery clips, with leads, the battery should be temporarily, removed.

The trimmer has a fixing bush with nut, and this holds it to the side of the case. See that full adjustment is possible, without the knob reaching the bush, or the screw-head touching the coil.

Soldering is not essential, but is quite easy if a clean, really hot iron is used, with a cored solder. Soldering instructions will be found on the solder carton. The iron must not be kept in contact with the leads longer than required, or heat may travel along the wire and damage the transistor

● Continued on page 258

Binding Colour Transparencies

By S. H. Longbottom

COLOUR photography has become increasingly popular during the past few years, and it is possible that you have often wondered whether your transparencies should be bound. You will discover that your stock soon increases and you are warned that these are far more delicate than black and white negatives. Any blemishes appearing on the latter are usually remedied by retouching the enlargement, but there is little we can do with the projected image. And the degree of magnification is so great that the tiniest speck of dust will be seen on the screen.

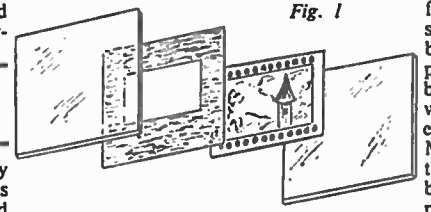


Fig. 1

It is essential, therefore, that transparencies should be handled both carefully and preserved from damage. When they are returned from processing they are usually mounted in cardboard frames. There is no protection whatever against scratches or fingermarks, and while the covers are handy for viewing through a pocket viewer, there are several reasons why we should take further precautions if they are to be projected.

There are many types of plastic holders available but not all of these offer full protection. Moreover, they are quite expensive. The real solution to the problem is mounting between small squares of glass, and this is not the tedious job you may imagine if tackled in the correct manner. There are many advantages of mounting between glass, the chief one being that they are protected from fingermarks and become dustproof. The film is held perfectly flat over its entire area during projection, giving a sharp picture of the whole.

When a transparency is projected while in a cardboard mount it will buckle slightly, even if the projector has a good cooling system. This buckling causes the film to become out of focus, necessitating readjustment of the focusing. And this can be annoying if you are showing a number of slides.

Investigation of costs will reveal that sandwiching between glass remains the cheapest and safest method, and the following will help you with the binding process.

The most popular size of cover glass for 35 mm. transparencies is 2 in. by 2 in., made to fit the projectors. In conjunction with these we use thin metal foil masks and some gummed binding strips. At one time it was the practice to bind the slides in the same way as a picture in passé partout, but the use of a binding jig and the prepared strips — which are mitred at the corners — eliminates the tedious part of the job. Moreover, the strips are packeted so that three-quarters are all black and the balance have a white side for titling purposes.

The jig shown is a 'Nebro', costing 12/6. Made in plastic, it has a small trough for holding water and a rubber sponge fitted in the base. A brush is included in the kit.

We have already said that dust is the main enemy, so every care must be taken during the operations. A quantity of cover glasses should first be washed and leathered, since they are sometimes a little greasy. Lay these on the table along with some binding strips, the transparencies and the jig. Keep out of draughts as much as possible to avoid floating dust. During the process of binding always hold the glass or transparency at an oblique angle against strong light, when you will be able to detect any traces of dust, which must be removed.

If the transparencies are in cardboard mounts the easiest way of removal is to cut the mount about ¼ in. from the bottom with a pair of scissors, when the two halves will open. The shiny side of the film is the back, and this should be

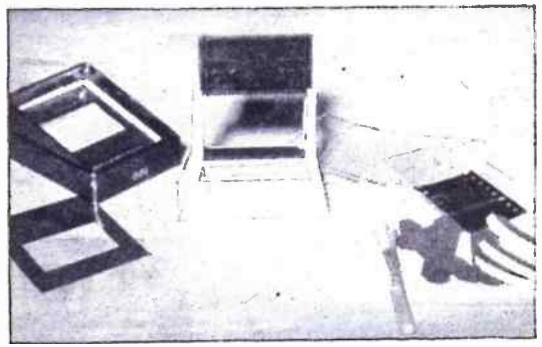


Fig. 2—On the left is the box of metal foil masks, and on the right are cleaned cover glasses and binding strips. The pressure block is ready to secure a strip placed in the jig.

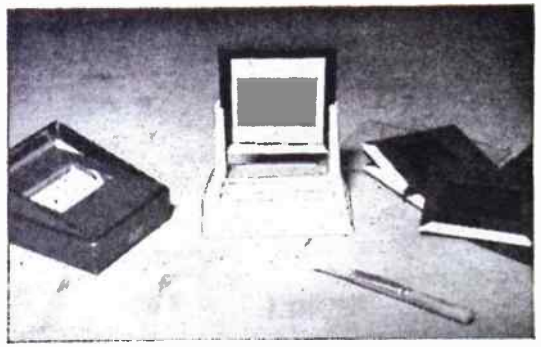


Fig. 3—A completed slide in the jig. Mounted, but untitled slides are on the right of the picture.

Fig. 4

clean. Breathe on the film and gently polish with a soft lintless cloth. I use a piece of old velvet which quickly absorbs the dust. If there are any fingermarks they can be removed by damping the cloth with a little carbon tetrachloride, but you are warned never to apply this chemical to the emulsion side of the transparency. Experience has proved that it is wiser to blow away any dust since scratches appear easily.

The position of the components is shown in Fig. 1, where we have a glass at the bottom, the transparency right way up and shiny side on top, a metal foil mask and the top cover glass. All have been cleaned and are ready for binding. These few components are held against the light separately and re-examined for dust. If there are any traces whatever, glide a soft camel hair brush over the surface and then place together. The transparency itself must be adjusted so that the horizon is level.

The binding jig is simple to use and will quickly bind the slide, but note the following points. A white binding strip is inserted in the bed of the jig, gummed side uppermost, as shown in Fig. 2, and the pressure block depressed. This secures the strip temporarily in the jig. The gummed surface is now moistened with the damp brush — do *not* overload the brush with water — the combined slide placed in the slot with the picture the right way up and the pressure block used for pushing the whole into the sponge rubber pad which lies underneath the strip. This action binds the base of the slide in the one operation and the same procedure is followed for binding the top, but using a full black strip instead. Finally, the two other sides are bound together with black strips and the slide is complete. This operation is shown in Fig. 3.

When a slide has been bound in this fashion it is left with the white strip on the base of the slide. Reverse the slide so that the transparency is upside down and the white strip at the top ready for the title and number, as shown in Fig. 4. The slides are stored and projected in this position, that is upside down and with the emulsion side facing the screen. This is most important, otherwise the projected image will be reversed.

You can use the binding strips without a jig, but this is more tedious, and the one described is a real speedy asset.

Beeswax is very handy in the home

BEESWAX is a very handy substance for the home handyman to keep about the house. It is surprising, though, how many people are completely unaware of its usefulness, so here are a few simple jobs to show you how handy it can be.

People who do home woodwork should always keep a block of beeswax at hand. It makes an ideal lubricant for planes. Not only does it make planing much easier, but it also imparts a lovely polish to your planes. Beeswax can be applied to saws to make cutting easier, and to give them a protective skin which prevents rusting.

Wood screws which are difficult to insert can be eased by smearing them with a little beeswax. This is specially recommended when screwing into hardwoods.

When you find drawers beginning to stick, then that is your cue to rub a little beeswax on the sides and drawer rails. This will make them slide freely again. Beeswax is also a good wood preservative and keeps insects and moths at large, so it is advisable to treat the insides of drawers and wardrobes periodically.

It is a good plan to rub the sash cords on windows, clothes lines and fishing lines frequently with beeswax. This gives them a protective covering, and helps them to resist weathering and rotting.

When decorating the walls of a room, here is a tip to prevent drippings spoiling the polished floor. Rub a thin film of beeswax on the surround of the room extending approximately one foot from the base of each wall. When you have finished decorating, then any paint that may have dropped can be easily wiped off with a dry cloth. There won't be any marks left, because the beeswax film will prevent the paint or distemper from drying on the floor.

Another useful job for this handy substance is stopping up small nail holes and cracks in wood. If the job is to be stained, then this method of stopping is specially recommended, because putty and plastic wood tend to show through.

Beeswax is a principal ingredient for the majority of furniture polishes. Melted beeswax, however, may be used by itself with excellent results. So, if you run out of furniture polish then remember — beeswax is the answer. (F.K.)

● Continued from page 256

MINIATURE TRANSISTOR SET

or diode. For this reason, the transistor and diode wires are left their full length. Satisfactory joints can be made in two or three seconds. Carefully twisted joints will also work. Heatless solder, as sold in tubes, should not be used, as it is not intended for electrical connections.

With the Red Spot transistor, the red spot on it marks the Collector, shown by C in Fig. 1. The centre lead is the base, shown by B, and the remaining wire is for the emitter, this being marked E in Fig. 1. If other transistors are used, the maker's system of identifying leads should be followed. Note that the red or positive end of the diode goes to terminal A. If the polarity is not marked, the best way round to connect the diode can be found by trial.

The usual kind of medium or high impedance phones, as used with crystal sets, will be satisfactory. A single earpiece, with a length of thin twin flex, can be carried more easily than a pair of phones with headband. If the phones have polarity marked, take positive to the P-positive terminal in Fig. 1, and negative to the P-negative terminal.

The aerial connection is taken to the terminal marked A. As the transistor can provide quite a lot of amplification, a fairly short aerial will often be sufficient. A piece of thin, insulated flex can often be arranged to provide a temporary aerial, either indoors or out-of-doors, or when camping, etc. A few trials will soon show what kind of results will be obtained with the aerial wire arranged in different positions.

If an earth connection is available, it is taken to the P-negative terminal, together with one phone lead. Out-of-doors, a temporary earth can often be devised by pushing a metal object into the ground, or clipping the lead to any earthed metal.

Any changes to the aerial or earth will make re-tuning, by means of the knob, necessary. The actual wavelength coverage can be adjusted to some extent, if required, by screwing the dust core of the coil in or out. This should be remembered if a station near the ends of the waveband mentioned cannot be reached.

WITH ROD & LINE

NEW TACKLE ITEM

There has recently come on to the market a range of plastic maggots in various colours. These will be available at tackle dealers all over the country, and I think that they will be a very useful item in your bag. For women anglers who don't like handling maggots these will fill the bill admirably. I have given these products a thorough examination and they look good to me, and I shall certainly give them a thorough trial when the season opens. It is a fact that already they have aroused keen interest amongst anglers.

AN ANGLING HOLIDAY

By 'Kingfisher'

MANY, many years as an angler-writer on all branches of the sport from shark to gudgeon fishing has brought me in contact with many thousands of anglers all over the country. My travels have taken me to all parts of England and Wales, both coastal and inland, in my search for good fishing waters, and the information I have gathered has enabled me to help anglers to enjoy first-class fishing holidays.

Now, apart from wanting to know of places which can provide good fishing there are a great many anglers, particularly those new to the sport, who want to know how to arrange for a fishing holiday.

First of all you have to decide what kind of accommodation you require, and here you have the choice of four types: hotel, boarding house, caravan or chalet, and camping. The two latter are often the best as you are then able to come and go as you please, and make your meal times to suit yourself. Unfortunately, the majority of hotel and boarding house keepers have not yet become sufficiently alive to the potentials of catering for anglers.

Let us take camping first of all. You must be well provided with warm clothing, as nights can turn very cold when camping near the water. A good sleeping-bag is a 'must'. Cooking utensils will be required, and unless you have your own transport you should arrange to camp within easy reach of a town or village, and also within the same easy reach of public transport, as you will want to obtain food supplies.

The site for your tent should be on higher ground than the river bank in case of rain and flooding, which can be uncomfortable to say the least, and the danger element of sudden floods cannot be ignored. This isn't intended to scare you, but to make you realize that caution is needed, and also a bit of foresight in choosing the spot for your tent.

Before the holiday arrives you should have written to the nearest town, a tackle dealer in the town will help, and found out all about the fishing, such as cost of licences and permits, the kinds of fish to be caught in the waters you intend to fish, the best baits and methods to use. And don't forget to enclose a stamped and addressed envelope for the reply. If you need licences and permits, send the money, and get these back before you start out for your holiday. Should you be in the country, the best way to ensure fresh bait is to arrange supplies to be sent to you on certain days by one or other of the many dealers who specialize in this service.

The foregoing remarks apply to those who prefer a tent to a caravan. If you choose a caravan then you won't require a sleeping-bag, but make sure beforehand what is provided in the way of sheets and blankets by the person from whom you hire the caravan.

Things are not quite so easy in the case of hotels and boarding houses unless they make a speciality of catering for anglers. If not you will most likely find that meal times are religiously adhered to, and if you are a bit late you may not be able to get a meal. When writing about accommodation it is wise to submit a short questionnaire on the following lines:

1. Are you willing to cater for anglers?
2. Are you prepared to put up packed lunches and flasks, so that the angler does not need to return for a mid-day lunch?
3. Are your times for the evening meal rigidly adhered to, or are you prepared to allow a little latitude?
4. Do you provide facilities for drying clothes?

This is important, as you may get caught in a heavy rainstorm or, looking on the pessimistic side you may possibly fall in the river!

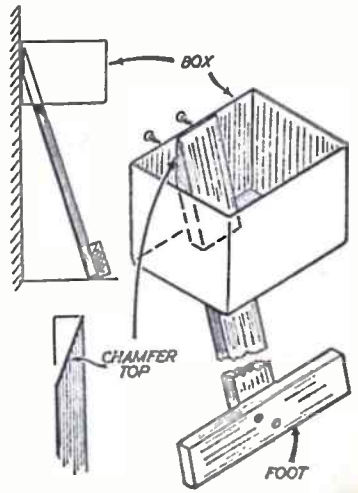
If you are staying near the coast for sea fishing, find out whether boats are available. It is surprising how many places with good fishing do not have boatmen willing to take anglers out.

One way of covering your mid-day meal is to book your accommodation bed and breakfast only, arrange with a local cafe to put up snacks for you, buy yourself a flask, and let them fill it for you, and if they put on good meals in the evening, you can go there for your dinner. Usually you will find plenty of places putting on cooked meals until a very late hour.

One thing is certain, you cannot afford to forget the subject of meals and merely trust to luck. A day on the water creates a wonderful appetite, and so the subject of food is one of major importance.

A CHIP BOX FOR RAWL-PLUGGING

USE this chip box when Rawl-plugging or drilling a plaster wall. Chippings and scraps are collected in the box instead of falling on the floor. Use any available size of scrap timber for the upright and foot. A card box will be strong enough for the job, fastened to the chamfered end of the upright with woodscrews. (R.H.W.)



WATER SKI-ING AS A MAJOR SPORT

ONCE regarded as a 'daredevil' stunt, water ski-ing is fast becoming one of the most popular water sports in this country. It looks easy enough, too — and once you have got past the novice stage it *is* easy. It is not a sport which demands super athletic ability, or any lengthy training. And as you learn you find it becoming more and more exciting as you begin to master new manoeuvres with all the excitement of speed and the exhilarating combination of sun, spray, and blue-green water.

Of course, you need the help of a fast motor boat for towing — and you have to be a reasonable swimmer. Outboard motors have brought the price of fast boats down to a figure that many families can now afford, with boat sizes small enough to trail behind the family car. So water ski-ing is no longer a sport for the wealthy only. Also you do not necessarily need to be an expert swimmer to be safe on water skis. Once past the 'beginner' stage you can water ski without hardly getting your feet wet — taking off and landing back on dry land!

The sport is said to have started with a group of French ski-troops in 1929 who tried using standard snow skis for being towed on water 'just to see if it would work'. It did, after a fashion, but they found it necessary to modify the skis by widening them and also using rubber bindings for their feet. The style of ski they developed by experiment is the standard pattern used today.

By R. H. Warring

Actually there are now several patterns of skis made in a number of different lengths, choice of the latter depending on the weight of the skier. The width of a water ski is usually about 6 in., or 7 in. for beginners. A pair of skis 5 ft. 6 in. long is then suitable for a person up to about 8½ stone in weight — 5 ft. 9 in. skis for someone up to 11 stone — and 6 ft. 3 in. skis for the bigger chaps! The longer length of ski is also a typical choice for beginners. Skis for children may be as short as 4 ft., again depending on their weight.

These refer to pairs of skis, intended for ordinary, conventional water ski-ing with one ski on each foot. Single skis — sometimes called slalom skis — are for the expert. A typical size is 6 ft. 3 in. long with a width of 7 in. One foot is fitted in the ski and the other is used to switch weight and balance and control direction of the ski — a technique which demands instant co-ordination of balance.

Long before those French soldiers invented water skis as we know them today, however, water skis had been developed for *walking* on water. The first record of their use, in fact, dates back to 1799. Most of the early attempts at walking on water, however, were unsuccessful, partly because the skis were too heavy, and partly because users found it very difficult to master 'balance'. One long-lasting difficulty was that if the water skier fell over he usually found it almost impossible to get up again. More often than not he found himself suspended upside down in the water by his skis, and had to be rescued hurriedly before he drowned!

Walking on water with canoe-type skis, in fact, can be very dangerous for this very reason. Modern skis which do not supply floatation are quite different. You certainly cannot walk on water with them — you would just sink. They provide support by planing over the water, when towed at a suitable speed. And if you do have a spill the foot fitting is so designed that you can kick your foot free, if necessary.

Notwithstanding the limitations of the early 'walking' water skis their use persisted right through until the 1930's. Karl Nanjestnik — an Austrian school-teacher — even walked across the Channel in eight hours on a pair of canoe-like skis and water-ski clubs were formed all over Europe. But this application of the sport never gained any real popularity and it was the towed method which eventually overshadowed it completely. Most of the recent technical developments in water ski-ing as we know it today have come from America, which is virtually the 'home' of amateur high-speed boating popularized by the powerful outboard motor.

To tow a water skier successfully a boat must have *speed*. The ordinary type of plodding motor boat is no good at all. You need a speed of at least 15 miles per hour, and preferebly more, to get proper support from the skis.

The real limit then becomes the size of motor required on a *suitable* type of boat. By 'suitable' boat we mean one that can plane over the surface of the water like a speedboat. Boats which *displace* water by cutting their way through it have a limit to speed which can be reached however much power you apply. Most modern 'runabouts', which can be as small as 8 ft. in length, are designed with *planing* hulls for high speed operation, and are quite modest in cost if built from 'do-it-yourself' kits.

Most experts agree that a 15 horsepower outboard is about the minimum size for successful ski-towing However, with the right type of boat — light, with a good width of stern — you *can* get away with a smaller motor, although you may not be able to pull the skier out of the water to start. In other words, you will have to start by pulling the skier off from the bank or ramp — literally 'snatching' him off into motion. A 7½ horsepower outboard will just about tow a 10 stone skier on a pair of 6 ft. 3 in. skis, and a 10 horsepower motor a 12-stoner on the same size of skis. An 18 horsepower outboard should be able to tow a total of nearly 20 stone on skis — two fairly lightweight skiers, for example, each on a pair of 5 ft. 9 in. skis. If you want to be more ambitious you have to use the next size up in power units — 35 horsepower. That sort of outboard will push a small boat along at well over 40 m.p.h.!

For towing, a standard length of tow rope is 75 ft., attached to a bar which the skier holds. Practice starts on land — how to balance, how to hold the towing bar. Then comes the time when the skier is ready for his first 'water start'.

With the skier in the water the towing boat starts forward at idling speed until the tow rope slack is fully taken up. The skier meantime is literally squatting in the water with his skis angled upwards and with the tips out of the water. With the rope taut, the boat driver opens the throttle wide, lifting the skier up into his proper skiing position in a matter of seconds. He can then adjust his speed, as necessary — and leave it to the skier to stay upright, skimming over the surface of the water!

The 'take off' drill for the skier is — arms straight, knees bent — and let the boat pull you up! If the skis start to wobble, they will automatically straighten out when there is sufficient speed — about 15–20 m.p.h. And once ski-ing straight, provided you do not lose your nerve, everything should be fine.

Since you cannot travel on in a straight line indefinitely, however, you will have to learn to turn — and also to stop! There are two types of turning or steering — one where you keep *inside* the wake of the boat and the other where you *cross* the wake. Once you have mastered the first you can try the second.

Steering is done by leaning and foot pressure. To steer to the right, relax at the knees, push down with your left leg and lean inwards to the right — and off you go to the right! Reverse the procedure, and back you veer to the left. It all sounds very simple on paper — and is not very much more difficult in practice.

To cross the wake, exactly the same technique is used, except that it is best to veer off to the opposite side *inside* the wake first and then take a sweeping turn so that you can cross over the rough edge of the wake more or less at right angles, bending the knees slightly to take the shock of the rougher water. The same applies to getting back inside the wake — take a wide enough sweep outwards to meet the rough water 'head-on', rather than try to slip through it sideways.

Before you reach the stage of mastering turns, you will almost certainly have fallen into the water at least once! Unless you get into real trouble, all you should need to do is to keep afloat in a 'sitting' position, like the start position, until the tow boat returns and drags the tow rope into a position where you can grasp it again. Then you can make ready for another normal start. The skis will have enough buoyancy to keep you afloat, and if you hang on to the tip of each ski you can keep your head well above water.

Stopping is the easiest of the lot. Just let go of the tow bar and crouch down in a squatting position. After skimming along the surface of the water for 10 or 15 ft. the skis will slowly sink into the water, leaving you in that familiar sitting position again, ready to be picked up. The more expert skier can arrange for this to happen in shallow water, when all he has to do is walk ashore — or even slide out right on to the shore, so that he can step out of his skis on to dry land.

The safety of the skier depends largely on the tow boat driver. His job is to steer a smooth course, giving other boats and obstacles (particularly swimmers) a wide berth. He misses half the fun, anyway, because he has to look ahead all the time, with just an occasional glance astern to check the position of his tow. Good technique means *safe* technique — there is no room for 'show offs' who are really only displaying their ignorance of the requirements of the sport. Water ski-ing is spectacular enough done properly. It can be positively *dangerous* if tackled in an irresponsible manner.

Normal sitting start

Preparing for a dry land start

THE BEAUTIFUL PEAFOWL

THE common peafowl is a native of India and Ceylon. It was introduced into England several centuries ago, and in the Middle Ages roast peacock was a great delicacy.

Nowadays peafowl are kept for the beauty of their plumage, the long tail coverts forming a train in the male bird. During the spring the cock may be seen displaying his beautiful plumage to any available female.

A white variety of peacock has been produced by domestication. A second variety is found in Burma and Java. This has a green-gold neck and breast.

(P.R.C.)

3—RETRACTABLE LOFT LADDER

FOR those of you who have a large trap opening and a comparatively low floor to ceiling height on the landing, a retractable ladder, as shown in Fig. 1, is for you.

The ladder is built as previously described, except that it is built solid and not hinged in two sections. It should be of a length that allows a gentle slope when in use, to 2 ft. above the trap level.

The opening and closing of the trap door is automatic, the door being allied to the ladder. The ladder runs on a wheel bearing, housed in two 1 in. square timber guide pieces, extending the whole length of the ladder sides and screwed in position (see Fig. 2). Use a rubber-tyred wheel as used on tea trolleys. It pivots on an axle of a nut and bolt, traversing a block of wood, which itself is screwed firmly to the trap door.

Start off with a good tight fit of the wheel in the channel, to allow for subsequent wear. Washers or distance pieces should be used to build up the wheel level into the channel, and to keep the ladder just free of rubbing the trap door when being moved.

As this wheel mechanism will determine the width of the ladder, it should be fitted first. To facilitate still further the easy movement of the ladder, a roller bearing is fitted at the top of the well opening (Fig. 3). As described before, it should consist of a metal tube running on a metal bearing. Extend the length of timber through which the bearing bolt traverses to a height of 12 in. This extension will serve as a retaining piece, keeping the ladder in place and on a straight course during movement.

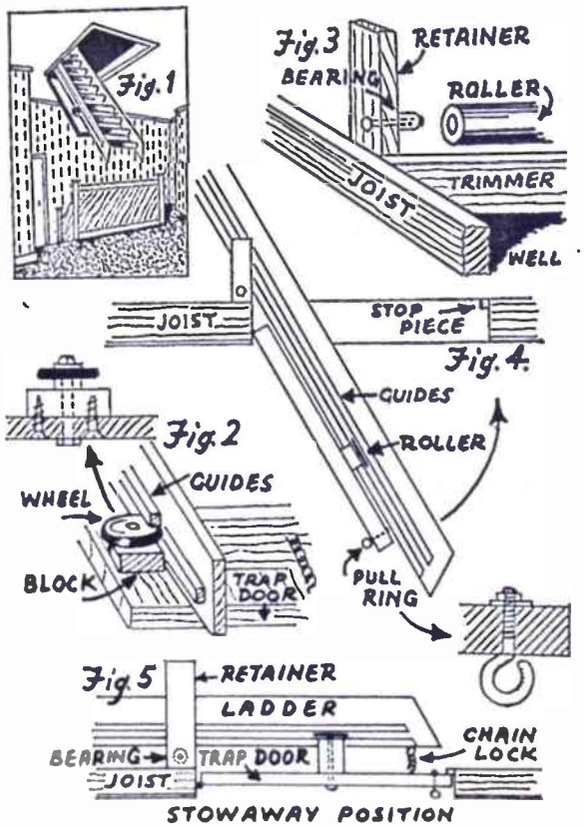
Fig. 4 shows the ladder being raised to its stow-away position. Note that the hingeing of the trap door is important. It must swing on the same axis as the ladder. Note also the stop piece, which is a length of 1 in. square timber, screwed to the well trimmer piece in such a position that when the ladder is stowed away, the trap door also closes level.

Also shown here is the pull ring into which the operating stick (see previous article) will locate to raise and lower the door. This pull ring will, however, have to take an added strain, for the ladder is affixed to the trap door. It must, therefore, be stronger than an ordinary shelf hook. A length of ¼ in. steel rod is threaded at one end, the other is shaped to a ring, then the whole is fitted through a hole drilled through the trap door and held with a nut and washer, as shown.

Fig. 5 shows the ladder stowed away and the trap door closed. A short length of chain should be affixed to the bottom rung of the ladder. The free end will be hooked into a shelf hook screwed into the trap door.

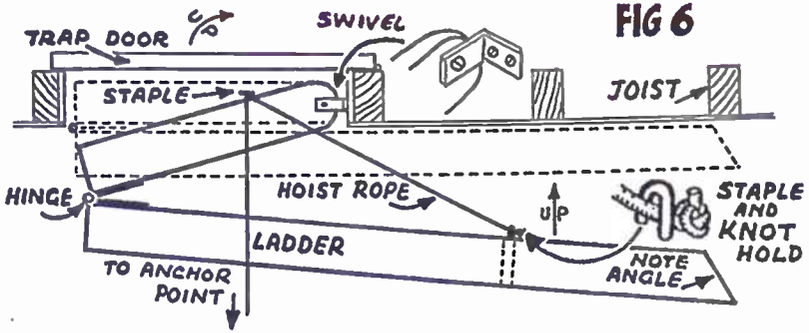
Before the ladder is finally pushed home to its resting position, the chain lock should be brought into use. This will prevent the ladder from 'wandering' in the attic or falling down, out of control, when being lowered.

The work on this type of ladder should not be rushed. As will be seen, every movement depends, in some respect, on the movement of other parts. Not that it is a complicated job. Check the work, as you progress, at every stage. When completed, you will have a fitment to be proud of.



For those of you who already have quite a sizeable trap opening into the attic and feel it is a lot of trouble to rehinge the door to hang downwards, Fig. 6 shows a simple suspended loft ladder that you may like. The disadvantage is that it is always on show, being hung up to the ceiling instead of out of sight in the attic itself.

A hinged type of ladder is used as described before. The difference is that the hinge cut must be made at a point that allows a short top part of the ladder to lie within the well cavity when it is stowed away.



In Fig. 6 the dotted outline shows this position, whilst the heavy black outline denotes the ladder being hoisted or lowered from this stow-away position for use. The ladder top swivels on an axle of a wood screw through the top hole of an angle bracket; the return end of the bracket being screwed into the well trimmer piece. Remember to round off the top of the ladder, so that it will not foul when swivelling. Remember also to cut the foot of the ladder at an angle, so that it rests level on the floor when opened out to its mounting position.

The ladder is raised or lowered by a rope of sash cord. It should be held to the ladder by driving a heavy-duty staple into the rear of the second or third tread, passing the rope through it and tying a knot.

From there, the rope passes through another staple driven into the well trimmer piece at an appropriate point, as shown in Fig. 6. The rope continues downwards, and its free end is anchored to a convenient hook, screwed into the wall, skirting board or door moulding.

Next: The floor and wall supports.

HOLIDAY NOTE BOOK

By R. L. Cantwell

OVER the years, while exploring the sea shore I have made many interesting discoveries which have furnished unusual data for my note book.

For example; on beaches where the current is strong one may find the egg-cases of the dog fish clinging to seaweed. When found they are empty, the new-born fish having escaped while still in deep water.

These egg-cases, about 2ins. to 3ins. long, are usually brown and the four tips of each are provided with coiled tendrils sometimes 1ft. long. They can be distinguished by the presence of these tendrils from the skate which they otherwise resemble. The tendrils serve to anchor the cases to seaweed or stones. In some species the outer surface of the case is quite smooth; in others it is delicately ribbed.

Cockles

Great quantities of cockles are sold for food in England. At low tide the cockles are completely buried and must be dug out, but when the tide flows over them, they push out two short tubes or siphons which just reach the surface of the sand, and through these tubes a stream of sea water flows, thus providing the cockles with oxygen and the tiny organisms which they require for breathing and nourishment. When disturbed from the wet sand a cockle quickly buries itself again, using its muscular feet for the purpose. A full-grown cockle measures just over 1in. in width.

Mussels

These are found everywhere around the English shores where the force of gales is not too strong. The dark slate-coloured, oval shells are attached to rocks or stones by a secretion formed by a number of sticky threads which harden immediately on contact with water. In suitable situations mussels grow in clusters and many thousands may be counted in a small area. A fully-grown one is about 2ins. long.

Oysters

These are for the epicure. British oysters were much esteemed by the Romans. Like most bivalves (molluscs with two hinged shells) oysters feed by filtering minute food particles from a stream of water which passes continuously through the body. They reproduce by discharging large numbers of minute larvae into the sea. These (known in the oyster trade as fry) settle down after a few days' swimming and grow shells.

At this stage the young oysters are called 'spat', and one of the most important duties of those engaged in oyster cultivation is to provide a suitable firm surface for the spat to settle on. Oysters rarely exceed 4ins. in length.

The Sea Horse

This is a true fish, but one which has undergone much modification. In the ordinary fish the tail-fin is the main organ of propulsion, but in the Sea Horse the tail-fin has completely disappeared, and the tail has become long, slender, and prehensile. Coiled round the fronds of seaweed, this tail acts as a support when the fish is resting. When swimming, the Sea Horse holds its back vertically and drives itself along by rapid vibration of the dorsal fin. The male takes care of the eggs until they hatch out, keeping them in a kind of marsupial pouch on the ventral side of the fish. Average specimens measure 3ins., but some are much longer.

Next time you visit the sea-shore, take a note book. The sea is a marvellous repository of curiosities.

★★★★★★★★★★★★★★★★
★ Next week's issue will contain ★
★ patterns for a Noah's Ark and will ★
★ describe how to make a folding bed ★
★ table and a modern padded stool. ★
★ Make sure of your copy. ★
★★★★★★★★★★★★★★★★

Mainly for Modellers

SWIVEL GUNS. — These are used by mounting on bulwark rails, and can be fired in any direction. They can be added to any galleon model of the sixteenth century and first decade of the seventeenth century, if the scale of the model is sufficiently large. I have fitted them on the larger of the Hobbies models, the Ark Royal, etc. They were filed out of brass wire, drilled for inserting a lill or bank pin, which was bent to shape (Fig. 1). The actual swivel gear was made from brass shim and a bank pin.

PAGES FROM MY NOTEBOOK

By 'Whipstaff'

TRESTLE TREES AND CROSS TREES. —In the Elizabethan period, the practice was to fit these on upper masts. They can be built up from stripwood, using size suitable to scale of model (Fig. 2).

PARREL. — This is a unit assembled from ribs and trucks. Through these the parrel rope passes to form a collar (Fig. 3). A parrel is used to attach the topsail yards to the mast in a manner that allows the yards to slide up and down the mast easily. The ribs were made of ash, and for scale modellers the following were the sizes in actual use. The rib was in length the diameter of the mast, and one-third as wide. The outside edge divided into two semi-circles with a hollow between, holes for the rope being bored through the middle of each semi-circle.

The truck was also of ash, the diameter being the same measurement as the width of the rib, and one and one-third of the diameter in length. It was also bored for the rope to match the rib.

There were several kinds of parrel — a single rope, a parrel with ribs and trucks, a parrel with trucks and single rope, and a truss parrel.

In making parrels, a lot depends on the scale to which we are working, which will govern the materials we use. For the smaller models in Hobbies range (Elizabeth Jonas, etc) I have found that the best result is obtained by using thin celluloid for the ribs and tiny flattish beads for the trucks. For the larger models (Ark Royal, etc) we can use the correct materials. I still prefer, where possible, the use of wood where this was used in the actual vessel.

Those with the Hobbies or other lathe can turn the trucks, and the ribs can be cut from thin wood, $\frac{1}{32}$ in. or $\frac{1}{16}$ in., according to the size of the model. Of course, for those who prefer to use them, larger beads can be used for the trucks in these larger models.

SWIVEL GUN
FIG.1.

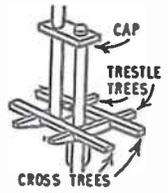


FIG.2.

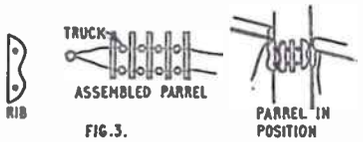


FIG.3.

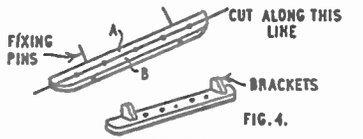


FIG.4.

GLUE A ON HULL, FIX SHROUDS & ADD B BY GLUEING & PINNING THROUGH INTO HULL

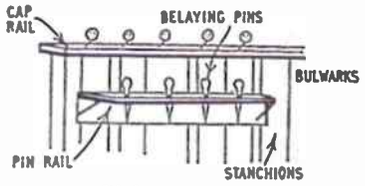


FIG. 5.

STRAKES. — These are what we also know as wales, and are actually made of thicker plank than the rest of the hull. This causes them to jut out above the level of the other planks to form buffers and run entirely around the hull, the main wale at the ship's greatest girth. Their purpose is to save damage to the hull from friction when in contact with landing piers, dock sides, etc.

In making these, I have found that the main defect in the average model is that they jut out too far from the hull, being sadly out of scale. When making up Hobbies old time kits, wales of accurate appearance can be added to your model by the use of strips of Bristol board for the smaller models in the series, and thin wood in the larger ships.

CHANNELS OR CHAINWALES. — In most of Hobbies models these are given on the design sheet and are usually in one piece, to simplify the actual rigging of these models, also to add strength to the channels when assembled. I use the method in Fig. 4.

The channel is made in two pieces by cutting down the centre of the holes drilled for the lanyards, after drilling through the edge to allow of two pins for securing them to the hull. Never rely on glue alone if you can add the additional security of pinning any part.

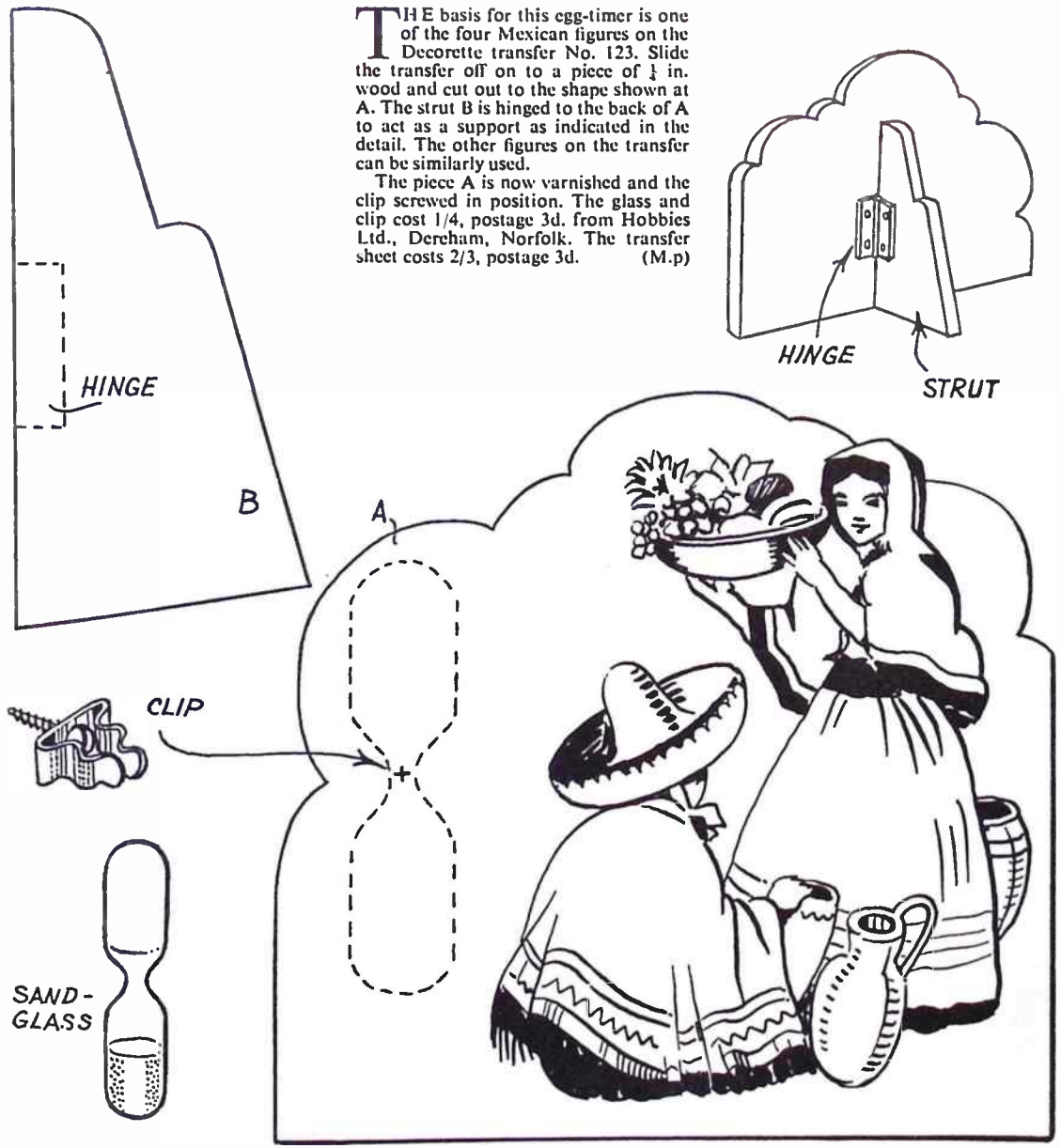
My actual procedure is to cut the channels in one long piece, or use a piece of stripwood the same width as the channel. Mark out the separate channels along its length, drill the lanyard holes and the edge holes, finally cutting off each channel. Extra support can be added by following in some models the full size method of supporting brackets.

PIN RAIL. — In models of later vessels, such as clipper ships, one can include the bulwark pin rails and, if firmly attached to the inside of the bulwarks, they can be used for belaying the lines of rigging that are secured here in actual practice.

The pin rail, as shown in Fig. 5, is below the cap rail, and secured across the stanchions. It holds the belaying pins with which the ends of running lines are secured.

For smaller models, suitable belaying pins can be made from pins. First flatten the head in a vice and give two or three turns of gummed paper around the head end. Simple ones can also be made from slivers of bamboo and adhesive paper. In larger models I find that they can be turned on the Hobbies lathe quite simply from brass or copper wire, a piece being chucked in the drill chuck and shaped with needle files.

A 'MEXICAN' EGG-TIMER



THE basis for this egg-timer is one of the four Mexican figures on the Decorette transfer No. 123. Slide the transfer off on to a piece of ¼ in. wood and cut out to the shape shown at A. The strut B is hinged to the back of A to act as a support as indicated in the detail. The other figures on the transfer can be similarly used.

The piece A is now varnished and the clip screwed in position. The glass and clip cost 1/4, postage 3d. from Hobbies Ltd., Dereham, Norfolk. The transfer sheet costs 2/3, postage 3d. (M.p)

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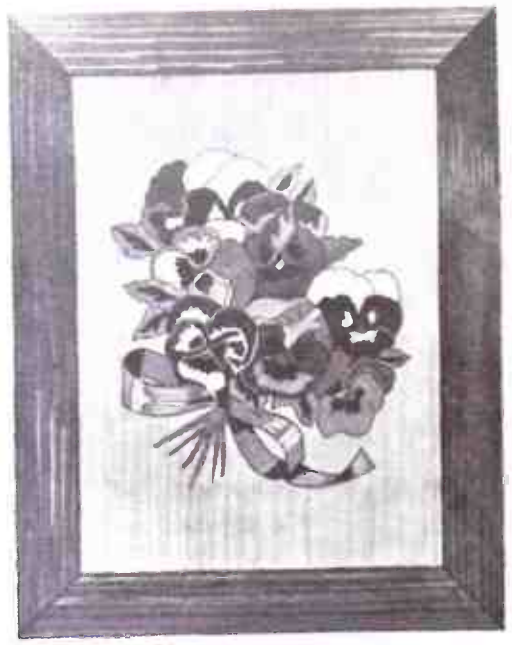
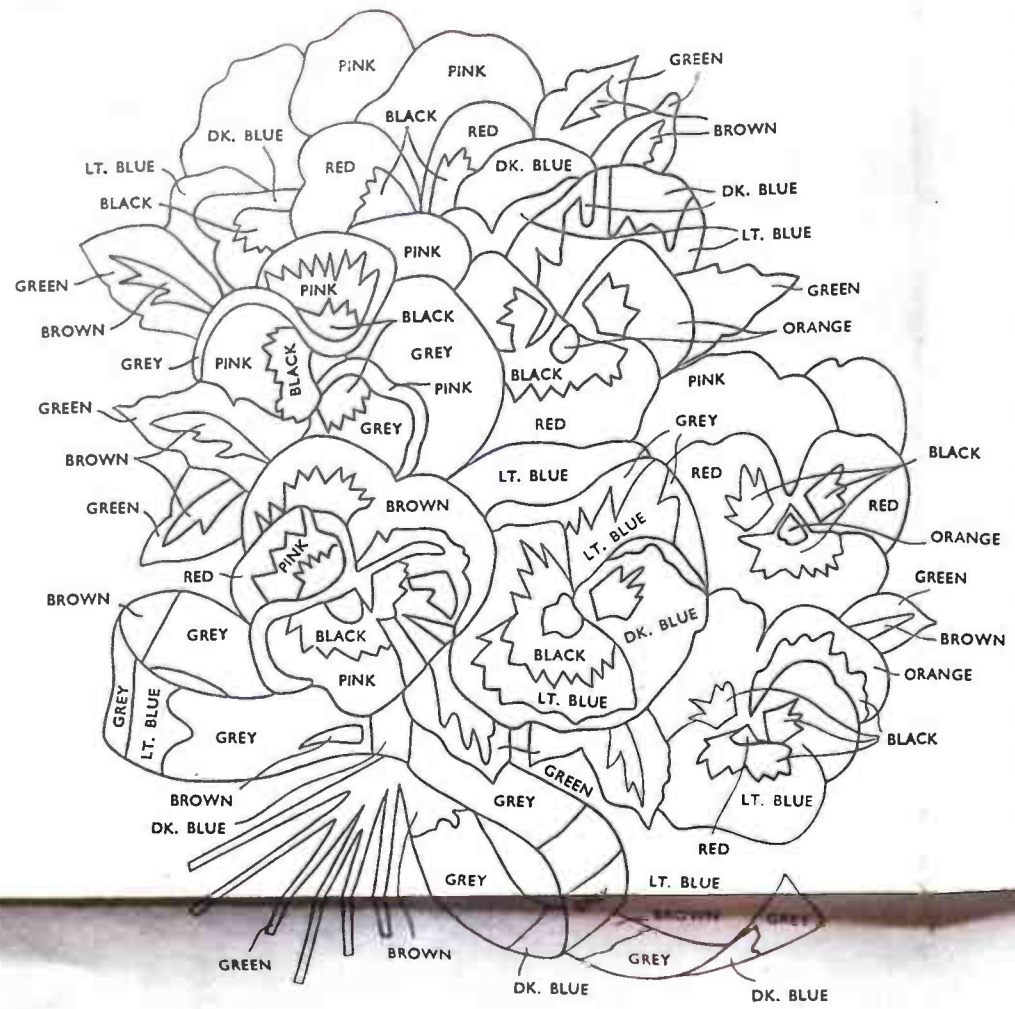


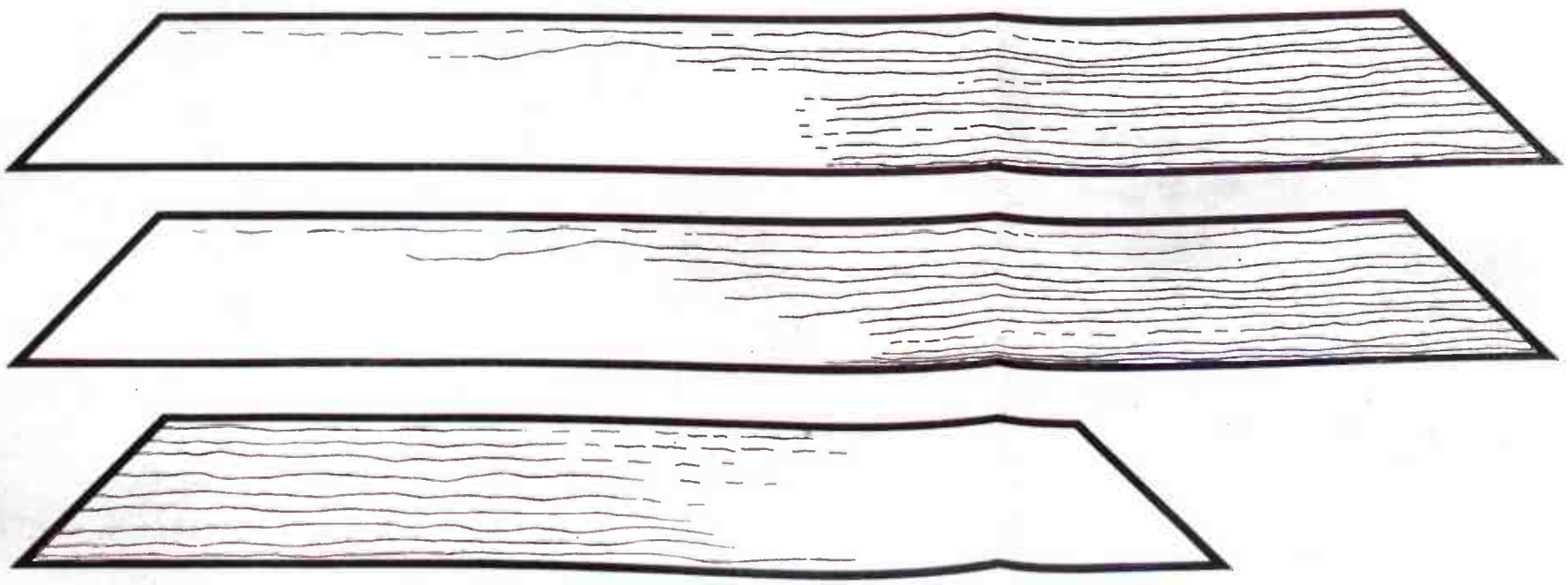
LIGHT OAK



BORDER VENEER

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

PRICE ON APPLICATION.



BORDER VENEERS

CUT ONE

OF EACH

PRINTED IN ENGLAND

1933 was a good year for Austrian philately. Highlight of the year was the WIPA exhibition in Vienna. A large variety of interesting private postal stationery exists from the show.

A special WIPA flight, Vienna–Budapest and Budapest–Vienna was organized, and special cachets were used on all mail carried.

AUSTRIA

For airmail collectors, the year 1933 brought two Kronfeld glider flights to the Semmering, and the Gray-Maribor (Jugoslavia) glider flight with a variety of private stationery with imprinted stamps. In addition to the events mentioned, no fewer than nine Austrian rocket mail flights also took place.

On 13th July 1933, just after the WIPA, the four-country flight of the Austrian glider pioneer Kronfeld, took place. He toured Austria, Switzerland, Italy and Hungary, and three special official cards were issued by the Austrian Government for it.

Three other semi-postal sets were issued by Austria that year, a record for the period before World War II. The first F15 set appeared in conjunction with the ski championships at Innsbruck on 9th January. The stamps commemorating the 250th anniversary of the relief of Vienna from siege by the Turks, appeared on 6th September.

The first Winterhelp set also appeared that year.

Below: Austrian stamps

MEADOPHOLOGISTS who enjoy good beer and a gossip with country folk will find The Harbour Inn at Exmouth in Devon an interesting place.

In summer you may meet famous cricketers and other noted sportsmen at this 800 years' old inn.

Mine host, Mr M. A. Rodmore, is assisted in the summer season by Oxford undergraduates. The first team of young men from Oxford were presented by local Cambridge undergraduates with a suitably inscribed and autographed china bowl, on which many others from the Varsities subsequently made their mark.

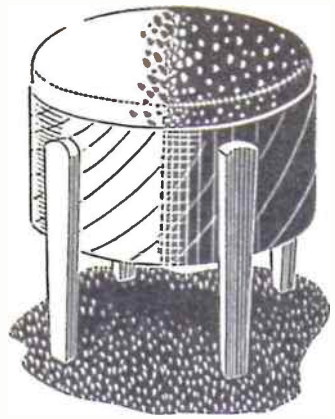
Exmouth was once the foremost port of the West Country.

Our photograph is of Kenneth Christie, who would like to thank readers for all their help. He is completely disabled, but since writing to the Editor he has found many new friends. Their kindness is helping him to get well. Why not write to Kenneth at 8 Oakland Villas, Reynoldson St., Newland Ave., Hull, Yorks.

Frederick Medis of 'Ivanhoe', Jambugasmulla, Nugegoda, Ceylon, writes — 'I am a regular reader of your magazine. I would like to write to other readers who collect match labels, stamps, coins, razor blade covers, postcards, antiques, dolls, shells, and cigarette cards.' The air mail cover of his interesting letter is illustrated below.

Rosella Jonas, of 1608 Mahaning Avenue, Youngstown 9, Ohio, U.S.A., writes: 'My main hobby is postcards. I would be glad to hear from any postcard collectors in the hope that I can exchange with them. I can furnish other hobby material in return for cards.'

And if you would like a friend in Grenada, write to Pansy Rowley, 3 Tyrrel Street, St. George, Grenada, West Indies.

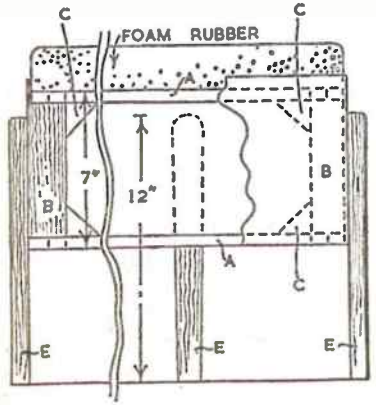


In modern style

A COMFORTABLE PADDED STOOL

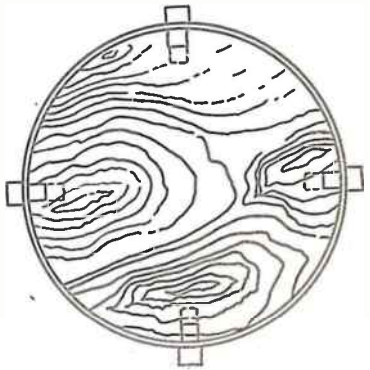
THIS stool is both smart and practical and can be made in a few hours by the handyman. The padded portion consists of a slab of foam rubber which forms a soft and comfortable seat for televiewing and other occasional uses. The sides and seat may be covered with material to match or harmonize with curtains or other upholstery.

The side view and plan in Figs. 1 and 2 show the general layout and the suggested sizes. The framework is made up from two circles of ½ in. plywood (A) and four supports of ¾ in. wood (B). These are shown in Fig. 3 where it can be seen that pieces B are notched to correspond with the cut away portions of pieces A. Glue and pin these pieces together and leave to dry.



SIDE VIEW

Fig.1



PLAN

Fig. 2

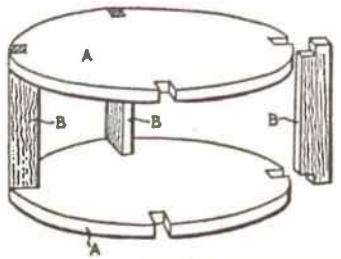


Fig. 3

The framework is covered with stout cardboard and heavy quality material as shown in Fig. 4. The material is overlapped round the cardboard and glued at the back. The cardboard should project about ⅜ in. at the top to hold the foam rubber in position. Glue the cover round pieces A, making the join down one of the pieces B.

The four legs (E) are now cut from ¾ in. thick wood, drilled to take countersunk screws and painted or varnished ready for fixing. They are fixed in position as seen Fig. 5. They must of course be screwed through the sides into pieces B.

The foam rubber seat is covered with material which is stitched in position underneath. (M.h)

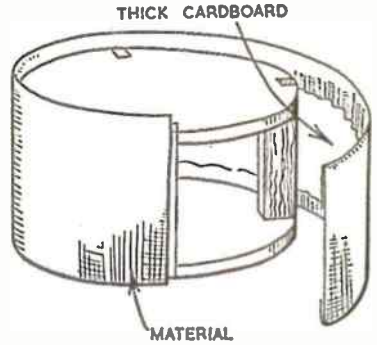


Fig. 4

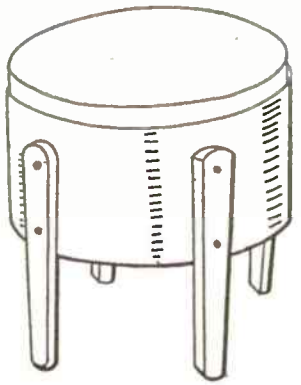


Fig. 5

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★ Next week's free design will be for ★
★ making a Child's Desk — a very ★
★ popular project which should created ★
★ a lot of interest. Make sure of your ★
★ copy. ★

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MARIONETTE CONTROLS

TO make the controls for your marionette described in previous issues, the following materials and tools are required: One wood lath, 2 ft. long; two small screws; one 1 in. small-headed nail; Tenon saw; hand-drill and a selection of bits.

Cut the lath into the following lengths: 12 in.; 4 in.; 4 in.; 3 in.. Bore small holes at each end of the 3 in. and both the 4 in. lengths, and proceed with the following instructions as illustrated in Fig. 1.

At 2½ in. from the end of the 12 in. length fix one 4 in. length across it with one of the screws. This is the bar for the hand strings and must be tightly screwed.

Turn over the 12 in. length so that the hand bar is now underneath. Measure ½ in. from the same end as before and drive in the nail. At 5 in. from the same end the 3 in. bar is attached by the other screw. Firstly, however, a hole must be drilled in the centre of the 3 in. bar slightly bigger than the diameter of the screw. The screw is driven in tightly enough to stop wobble, whilst still permitting easy lateral movement. This bar will take the shoulder strings.

Immediately behind this bar two holes are drilled side by side. They must be sufficiently far enough from the bar to ensure that the head strings that come through them are not impeded in their movements.

Finally, a small hole is drilled at the far end of the control to take the back string, and the control is now ready for the strings to be attached.

The materials required for stringing are as follows: Black button-hole thread if possible, but black cotton will do; a needle; one small curtain ring; one 1½ in. elastic band; one drawing pin.

It is advisable to make the strings only as long as is needed to bring the controls to waist level when the puppet is standing on the ground. Any performance longer than ten minutes duration can be very exhausting to an operator who is forced to keep his hands high owing to the inordinate length of the puppet strings.

By G. A. Edmonds

Begin with the shoulder strings. In this way the puppet can be hung from the controls when completing the remainder of the stringing. Lay the puppet on the table and sew a shoulder thread through the seam halfway along each shoulder. Tie the other ends of the threads to the holes at each end of the shoulder bar on the controls. Keep each thread separate and do not allow them to cross. The control can now be hung for the easier stringing of the remainder.

We now deal with the head strings. Prepare the curtain ring by hitching the elastic band around it (as seen in Fig. 2.) so that it is ready when required.

The head is replaced on the head strings that were left at the neck of the puppet. A thread is tied on each of these strings close to the head and any excess string is cut off. Keeping the head threads as taut as are those from the shoulders, thread one through each of the holes behind the shoulder bar and tie both to the curtain ring. Fix the end of the elastic band to the centre control shaft by a drawing pin after making sure that the shoulder and head threads are of equal tension (Fig. 2)

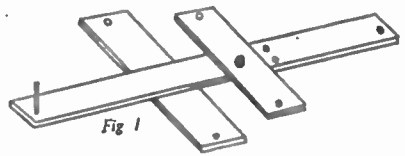


Fig. 1

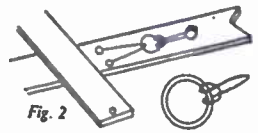


Fig. 2

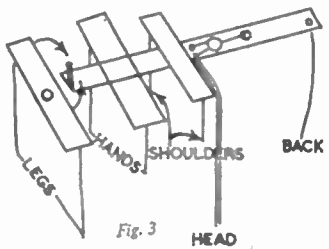


Fig. 3

The head is now upright and there should be little tendency for the puppet to turn whilst it is hanging. A test should now be made to see if the curtain ring mechanism is working smoothly.

Hold the centre shaft as if for normal operation, and place the forefinger of the hand holding the shaft into the curtain ring. If the threads are running easily through the holes, then move the finger forward and the head should drop. Let go the ring, and the head resumes its normal position. Pull the ring back, and the head looks upward. Move the ring backwards and forwards, and the head makes the 'speaking' movement.

The five remaining strings are looser than those already fixed, but be warned about having them too long.

Tie a thread to each of the strings that emerge from the backs of the hands, and cut off the excess string. These threads are attached to each end of the hand bar, making sure that the hands hang loosely.

The back thread is sewn to the dress on the back of the puppet at a point just below the waist, and the other end is tied to the hole at the back of the controls. This ensures that when the upper half of the puppet is bent forward, the hips and the legs remain erect.

Finally the strings for the legs. Take the remaining 4 in. bar and drill a hole in the centre big enough to allow the bar to be placed on the small-headed nail at the front of the controls, and to be removed easily, as in Fig. 3.

With this bar in place on the nail, sew a thread to the top of one knee and tie the other end to this leg bar, leaving the thread to hang limply. Do the same with the other leg.

Operating the Controls is best described by listing each operation separately. It is a good idea to stand a mirror on the floor against a chair so as to see the reflection of the puppet; then the operator gets the same view as the audience.

Walking

Hold the controls in one hand and remove the leg bar with the other. When the bar is rocked sideways one leg after another should lift and bend at the knee, with the lower leg still hanging down, and then straighten out as it returns to the ground. As the controls are moved forward, we have the typical puppet walk.

Should the legs not perform in the manner described, then perhaps the feet should be weighted. Experiment with Plasticine, plaster, solder, or lead, or any other usable material, until the desired effect is obtained. It is also worth looking at the dress around the knee to see if it is too tight.

Hand movements

The hands may be moved separately by pulling at the appropriate string, or together by pulling at both.

Head and shoulder movements

The head and the shoulders may be made to move for the puppet to look

● Continued on page 273

For the model maker

Low Voltage Circuit Interrupter

THIS circuit interrupter works automatically, and is intended for use in a model light-house, or any other model where small bulbs need to be switched on and off at regular intervals. The 'on' and 'off' periods can be adjusted somewhat, but will usually be at intervals of between about 1 second and 6 seconds. This is satisfactory for flashing lights in many models.

The interrupter is made on a strip of wood about 5½ in. long, 1½ in. wide, and ¼ in. thick. The actual dimensions of the various parts will not make any difference to the working, however. Two blocks of wood, with two long bolts, to clamp the bi-metal strip, are also needed. At the other end of the interrupter, a small piece of brass, such as can be cut from an old dry flash-lamp battery, is fixed with a small bolt, as in Fig. 1.

By 'Modeller'

The bi-metal strip

This consists of two strips of thin metal, each about 4½ in. long and ¼ in. wide. Different metals must be used, so that they expand at different rates when heated. Thin tinned iron, and thin aluminium, such as can be cut from household canisters, will be satisfactory. Copper is suitable instead of the aluminium. With some household commodities, the barrel of the container is made from tinned iron, and the end (or lid) from an aluminium alloy.

The two strips are the same size, and should be flat, with no rough edges to cut the insulation. A small bolt holds them tightly together at one end, as in Fig. 1. A layer of thin insulation, such as paper or transparent tape, is bound tightly round the strips. The heater winding is made on top of this insulation, as shown. For most small bulbs and batteries, 32 S.W.G. resistance wire will do, and about thirty or forty turns are wound on the insulation, slightly spaced from each other.

One end of the winding goes to the small bolt mentioned. The other end is taken to one of the long bolts. The bi-metal strip is then clamped tightly between the two blocks of wood, as shown. The bolts should not touch the metal strips.

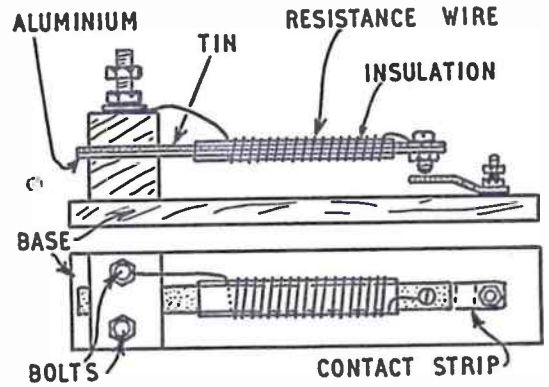


Fig. 1—Bi-metal strip and contact

The operation of the strip can now be tested by connecting a small battery from the long bolt to the projecting end of the bi-metal strip. After a few seconds, the unequal expansion of the metals should make the free end of the strip rise ¼ in. or so.

The small fixed contact strip is so adjusted that the point of the small bolt bears lightly upon it, when the strip is cold. As current flows, the strips slowly heat, until the end rises and interrupts the circuit. The strip then cools, so that the contact is restored. Current then flows again, and this sequence is repeated as long as the battery is connected.

Interrupter circuit

The wiring for a small light-house or similar model is shown in Fig. 2. Interrupter, battery, and bulb are simply joined in series. To stop the bulb permanently, the battery is disconnected, or a switch added in one battery lead.

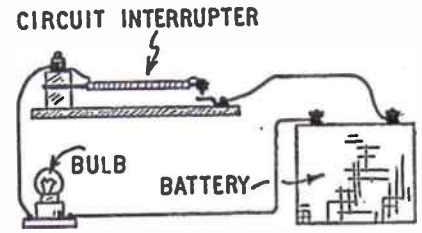


Fig. 2—Electrical circuit

Some voltage drop arises in the interrupter winding, so the bulb must be of lower voltage than the battery — for example, a 2½V. or 3½V. bulb with a 4½V. or 6V. battery. The current taken by the bulb also governs the speed with which the strip heats, and the brightness of the bulb, with a given battery. So a few trials should be made with different bulbs and batteries, if necessary.

If the metal strips are thin and flat, the resistance winding will only need to grow warm — not hot. The device can only work if the strip is clamped firmly, and the end bolt is tight. It is also necessary to have the aluminium at the bottom, as shown.

The interrupter cannot be used with mains voltages. But it can control the flashing on and off of several low-voltage bulbs, if needed. Other gauges of resistance wire will also work. The timing interval can be changed by bending the contact strip, or altering the number of resistance wire turns on the strips.

● Continued from page 272

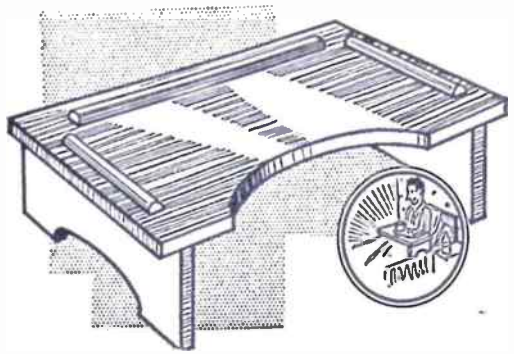
MARIONETTE CONTROLS

around by pushing forward one side of the shoulder bar which is loose on its screw. If this movement is not excessive the legs and waist will remain pointing to the front whilst the upper part of the body turns.

For other movements, practise before the mirror will soon bring what is wanted within the limitations of the puppet.

A simply-made stage for the marionette will be described in another article.

A FOLDING BED TABLE



By F. Kerr

EVERY home should have a bed table of some sort because it is such a handy item during times of illness when invalids usually have to eat, write and possibly do some light work in bed. The illustration at Fig. 1 shows a handy table which folds flat when not in use so that it can be easily stored away or used as an ordinary tray. The construction is very simple and there are no intricate joints to make. The measurements given in the accompanying illustrations will make a handy-sized bed table but of course these may be modified to suit individual requirements.

The table top is made from ¾ in. thick plywood. Cut this to the required size and round off the corners for added appearance. Note also, that a shallow curve should be cut from the front edge to allow the table to be drawn closer to the body when in use. Smooth off the sawn edges with a rub of glasspaper. After this, three lengths of moulding, about ¾ in. broad, should be fixed to the top surface to serve as a border. The three pieces of moulding may be fixed quite independently from one another so that no corner joints are necessary. Position them about 1 in. or so in from the edges. If desired, plastic topped plywood may be used for making the table top. However, if you intend to use ordinary plywood and cover the surface afterwards with some plastic material then do this before fixing the three border mouldings in position. This will avoid unnecessary cutting of the plastic material.

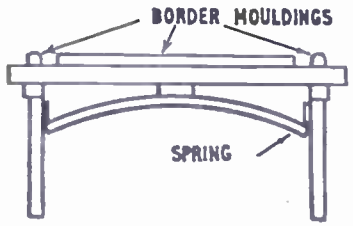


Fig. 1

Next, the legs should be made. These are also made from ¾ in. thick plywood and should be cut to the shape shown in Fig. 2. Use a bow saw, coping saw or padsaw to cut the necessary curves. Once again smooth off the sawn edges with glasspaper.

Two hinging strips, ¾ in. square, should now be screwed to the underside of the table top. Note from Fig. 3 that they are positioned directly underneath the side mouldings on the upper surface. This will ensure that the points of the fixing screws will not be noticed on the surface. When this is done, hinge the two brackets in position using two pairs of brass butts.

The spring block, 3 in. by 1½ in. by ¾ in. should now be glued and screwed in position at the centre on the underside of the table top.

Now comes the fixing of the spring. This consists of a piece of hardwood, preferably oak or beech, 1½ in. by ¾ in. Fig. 3 shows how the spring operates. The ends are held in position by means of two plywood stops which are fixed to the sides of the legs. The length of the spring should be carefully made to suit the job. A tight fit is desired so that the legs are kept firmly in the open position.

Finally, complete the job by painting, staining or polishing, as desired.

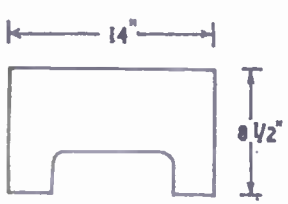


Fig. 2

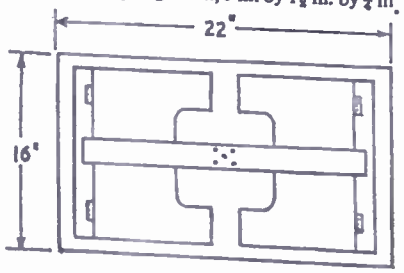


Fig. 3

PHOTO FILTER CASE

AN attractive vest-pocket filter case can be made easily by modifying a cheap cigarette case for this purpose.

Remove the elastic bands and cut a piece of plywood to fit into one side; cut the corners and shape the sides carefully so that the wood fits neatly, and flush with the edges of the case.

Cut a number of holes in the plywood sufficiently large to take the filters. They should be cut a shade smaller than required and glasspapered round until a neat fit is obtained for each individual filter.

Place a white card in the case before fixing the wooden frame in place. Stain the wood slightly and then fix it in the case by bending down the flanges which originally held the elastic bands. Write the names of the filters on the white card before putting the filters away.

Fit another piece of decorated wood to the other side, to hold the filters securely in position when the case is closed. (R.W.)

CHEMISTRY AT HOME

In response to requests from some of our readers, Lawrence A. Fantozzi, the contributor of these articles, is now incorporating chemical symbols, formulae and equations as applicable. It is hoped by this means further to assist the more advanced student while at the same time maintaining the general interest. —Editor.

INDUSTRIALLY known as 'yellow prussiate of potash', potassium ferrocyanide has the formula $K_4Fe(CN)_6 \cdot 3H_2O$. Two interesting facts arise from this formula. First, that it owes its crystalline form to the three molecules of water of crystallization and, second, that it is derived from hydroferrocyanic acid, $H_4Fe(CN)_6$. That an acid should contain iron, Fe, is in itself curious, for iron usually acts as a base. Despite its sinister name, potassium ferrocyanide is not poisonous.

Gently heat a little potassium ferrocyanide in a crucible. It turns from yellow to white, losing its water of crystallization and falling to powder.

Add some solution of ferric chloride, $FeCl_3$, to one of potassium ferrocyanide. An intense blue precipitate forms. This should be ferric ferrocyanide, $Fe_4[Fe(CN)_6]_3$, in accordance with the equation:

$$4FeCl_3 + 3K_4Fe(CN)_6 = Fe_4[Fe(CN)_6]_3 + 12KCl$$

but unless special conditions are observed mixtures containing potassium are obtained. These mixtures comprise the pigment Prussian Blue.

To obtain pure ferric ferrocyanide it is best to start from hydroferrocyanic acid, but before passing to this you will undoubtedly like to prepare Prussian Blue. In industry the preparation of this pigment is one of the most important uses of potassium ferrocyanide.

Dissolve 15 grams of ferric chloride in 200 c.c. of water and 12·6 grams of potassium ferrocyanide in 200 c.c. of water (warming the water will speed the solution of the salt). Stir the potassium ferrocyanide solution into the ferric chloride solution. Pour the blue liquid into a big bottle fitted with a siphon (Fig. 1) and nearly fill with water. When the blue precipitate has settled well, siphon off the clear upper liquid by blowing down tube A, and then fill up again with water. Repeat this washing by decantation several times, and then filter off the Prussian Blue and dry it in a not too hot oven or in the air.

It looks rather like indigo, and has a similar bronzy lustre. The latter is increased by rubbing. Another pigment can be made from this. Heat a little of it in a lidded crucible. Do this in the open air or in the fire, since poisonous vapours are given off. When the crucible has been red hot for a few minutes, let it cool. A brown powder will be found within. Boil it with water, filter off, and wash it several times. The resultant pigment is Prussian Brown and consists of ferric oxide, Fe_2O_3, and carbon, C.

By rubbing up a little of each of these pigments with weak gum water on a glass sheet by means of a pliable knife, blue and brown water-colours may be made.

The hydroferrocyanic acid needed for the preparation of pure ferric ferrocyanide is obtained by precipitation from potassium ferrocyanide solution with hydrochloric acid, HCl:

$$K_4Fe(CN)_6 + 4HCl = H_4Fe(CN)_6 + 4KCl$$

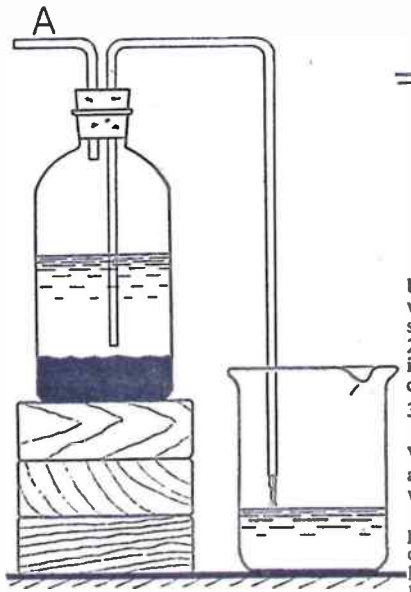


Fig. 1—Siphon washing of Prussian Blue

potassium chloride, KCl, remaining in solution.

Dissolve 42 grams of potassium ferrocyanide in 170 c.c. of boiling water and continue boiling for a few moments to expel dissolved air, for this would otherwise cause slight oxidation of the hydroferrocyanic acid. Let the solution cool and then stir in 50 c.c. of strong hydrochloric acid (caution; corrosive). A white precipitate of hydroferrocyanic acid appears which turns faintly greenish-blue.

Now filter off under reduced pressure using a filter pump (Fig. 2). Wash with several small lots of strong hydrochloric acid. Keep the acid in a well-closed bottle just large enough to hold it until needed, so as to protect it as far as possible from the air.

Remove about a quarter of it to a beaker and stir in small quantities of water until it has dissolved. Add a solution of 9 grams of ferric chloride in 200 c.c. of water, and stir well. An intense blue precipitate of ferric ferrocyanide forms:

$$3H_4Fe(CN)_6 + 4FeCl_3 = Fe_4[Fe(CN)_6]_3 + 12HCl$$

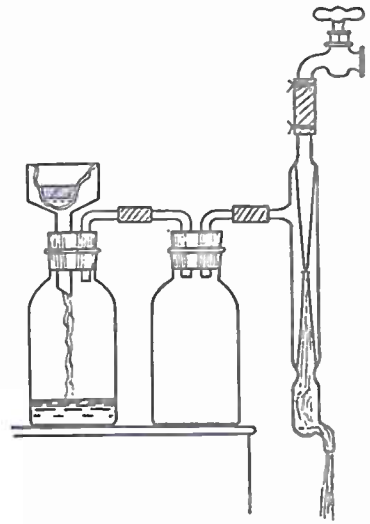


Fig. 2—Filtering hydroferrocyanic acid under reduced pressure

Wash it several times in a large funnel, and then let the bulky blue mass dry in a warm place.

Some soluble ferrocyanides may be prepared by acting on ferric ferrocyanide with a metallic hydroxide. The latter produces insoluble ferric hydroxide, $Fe(OH)_3$, which may be removed by filtration. Calcium hydroxide

(slaked lime), $Ca(OH)_2$, for instance, gives calcium ferrocyanide, $Ca_2Fe(CN)_6$:

$$Fe_4[Fe(CN)_6]_3 + 6Ca(OH)_2 = 3Ca_2Fe(CN)_6 + 4Fe(OH)_3$$

Take about half the ferric ferrocyanide you prepared, and suspend it in enough water to give a very thin cream. Clamp the flask in a boiling water bath, and add small quantities of calcium hydroxide until the blue colour just disappears and gives place to a brown. Filter off the brown ferric hydroxide and expose the pale yellow filtrate to the air. This removes any dissolved calcium hydroxide by letting it combine with atmospheric carbon dioxide, CO_2, with precipitation of white calcium carbonate, $CaCO_3$:

$$Ca(OH)_2 + CO_2 = CaCO_3 + H_2O \text{ (water)}$$

When the solution grows no more turbid, filter it, and you have a filtrate consisting of calcium ferrocyanide. As it is difficult to crystallize, it is best kept in solution.

For the preparation of soluble ferrocyanides the free acid may also be made to react with a carbonate in the normal way. Magnesium ferrocyanide, $Mg_2Fe(CN)_6 \cdot 12H_2O$, is formed by dissolving magnesium carbonate, $MgCO_3$, in a solution of the acid:

$$H_4Fe(CN)_6 + 2MgCO_3 = Mg_2Fe(CN)_6 + 2CO_2 + 2H_2O$$

the twelve molecules of water of crystallization appearing when the solution is crystallized.

It should be noted that the magnesium carbonate of the laboratory is a mixed basic carbonate. Consequently, no exact formula can be assigned to it. Hence the convenient use of the formula of the normal salt, $MgCO_3$, to show the main reaction.

Dissolve about half the remainder of the hydroferrocyanic acid in just enough cold water, and stir in small quantities of magnesium carbonate. When the effervescence due to evolution of carbon dioxide no longer takes place, filter from excess magnesium carbonate and evaporate to the crystallization point, and allow the solution to cool down overnight.

Pale yellow crystals of magnesium ferrocyanide separate and may be dried on a porous tile. Further crops can be obtained by evaporating the mother liquor.

In a similar way strontium ferrocyanide, $Sr_2Fe(CN)_6 \cdot 15H_2O$, may be obtained by substituting strontium carbonate, $SrCO_3$, for magnesium carbonate.

Fire Races and Magic Pictures

HAVE you ever seen one of those mysterious 'fire races' that are sometimes found in Christmas crackers? The novelty is classed as an 'indoor firework', is quite safe to use, and consists of a thin sheet of rough paper upon which pictures of racehorses or aeroplanes are often printed. You are instructed to bend down the edges of the paper, stand it upon a plate, and then to touch several numbered black crosses with a red hot nail or cigarette end. To everyone's surprise little lines of sputtering fire will proceed upon erratic courses from the black crosses. Great fun is had in guessing which smouldering 'racer' will be the first to reach a printed 'finishing line'.

You can easily manufacture these amusing games and make exciting fire pictures of animals and people. Apart from a little artistic skill, a fine water-colour brush and some sheets of soft finish notepaper, you will need a saturated solution of potassium nitrate in water. Another name for potassium nitrate is saltpetre. Obtain an ounce at a chemist's shop. You had better explain to the chemist what you intend to do with your purchase. Prepare your saturated solution by dissolving the potassium nitrate in an eggcupful of hot water. Keep stirring with the end of a spoon and only stop adding the solid when no more can be dissolved by the water.

Make your games or pictures by painting the solution on to the paper in simple and continuous outlines. You will not be able to draw odd details like eyes and separate ears. Leave a gap of ¼ in. between where your outlines start and finish. Mark an ink or pencil cross where you intend the start to be. If you decide to make race games, let the various tracks wander about in a haphazard fashion. This will cause much hilarity later on. Now you must let the solution dry upon the paper. When your fire games and pictures are finished, the trails of saltpetre should be invisible.

In order to demonstrate your fiery miracles, turn down the edges of the papers and stand them where the smouldering fire can do no harm. Touch the crosses with the point of a red hot knitting needle and watch the hissing points of fire trace out the secret tracks of saltpetre. A series of 'fire Derby's' may be run, and youngsters will bo delighted to see the little animals and people 'grow' before them. If you are not very good at drawing, cut out the simple shapes of beasts and men from magazines, and use these as templates by carefully painting round them with the brush. Do not make your outlines too wide. (A.E.W.)

● Continued from page 277

FUN WITH STATIC ELECTRICITY

the crease, in the left hand. Stroke the paper, downwards, using the thumb and first finger of your right hand. Note that the ends of the strip fly apart and remain so, because you have given them like charges of electricity. Repulsion between similar electric charges is the principle of the static detector, or electroscope.

You can soon make a simple, but very effective, type of electroscope. Fashion two little spheres out of ¼ in. cubes of cork, using a razor blade and glasspaper, and join the balls together by means of a 6 in. length of cotton or silk thread. Make cork balls may be suspended, by bending an 18 in. length of ¼ in. diameter glass tubing over a Bunsen flame. Fig. 2 will illustrate the correct shape. Nail a cotton base, then erect the gallows by inserting the lower end into the cotton reel. Suspend the cork balls from the top of the gallows, in such a manner that they hang at the same level.

Put a charge on one side of a rubber balloon and hold the negatively charged surface just beneath the cork balls of your electroscope. Electrons will jump across to the cork balls, which, being insulated from earth by the glass gallows and thread, will become strongly charged negatively. Like charges repel, so the cork balls will fly apart, whilst vibrating in a curious manner, and may remain parted for several seconds after you take away the charged balloon. When you test the uncharged side of the balloon your electroscope will not be affected. Try testing plastic or sealing wax rubbed with wool, or a dry glass rod, rubbed with warmed dry silk.

Static electricity exists everywhere. You will produce electricity whenever you rub your feet upon a mat, tear a piece of paper, or stretch a rubber band. Ladies will have noticed the lively crackle of electricity whilst they are undressing and warm nylon garments rub against wool.

FUN WITH STATIC ELECTRICITY

HAVE you ever combed your hair and then used the plastic comb, like a magnet, to pick up little pieces of newspaper and bits of thread? If not, try the experiment and demonstrate how your body can be a generator of static electricity. Hold the 'charged' comb above your head and look at yourself in a mirror. Your hairs will stand on end and repel one another. If the weather is very damp and hot you may be disappointed. For the best results, experiment by the fireside.

'Static' means electricity standing still. It does not flow like current electricity. Static charges accumulate upon the surfaces of insulators, like glass, plastic, and sealing wax when we rub them with fur, silk or wool. If you hold a key near a plastic comb which has been charged by friction through your hair, you may hear a tiny crackle, as a miniature spark of electricity jumps across to the metal and is conducted, via your body, to earth. You will have proved that static can be converted to current electricity by 'discharging' through a conducting substance. All metals, together with water, carbon, and human beings are good conductors, or 'carriers', of electricity. Now you will know why it is difficult to perform experiments with static electricity on summer days, for then the warm air is bound to hold some moisture which will constantly conduct away electric charges as they are produced.

Take a large sheet of thoroughly dry newspaper, hold it against a dry wall and rub it hard, all over, with a piece of dowel or broomstick. When you stop rubbing and remove your hands the whole sheet will adhere to the wall and will remain 'stuck fast' for a period of time which depends upon the dryness of the air and wall. When you rub the paper it acquires an electric charge which causes it to attract the surface of the wall, just as a magnet will cling to a corrugated iron fence. Equip your friends with wooden rods and sheets of paper and see who can make his paper stay longest upon the wall.

For the next experiment you will require a simple turntable, made as follows: Construct a little pedestal by screwing a

By A. E. Ward

4 in. length of ½ in. diameter dowel to a wooden base block measuring 3 in. by 3 in. Firmly insert a sawn off piece of a steel knitting needle into the top of the dowel 'pillar', in such a manner that it points vertically upwards for about 2 in. Seal over one end of a 1½ in. long stub of narrow bore glass tubing by holding the end in the top of a hot Bunsen flame and steadily rotating the glass between your fingers. Bore a hole in the middle of a 1½ in. diameter slice of cork, into which the sealed end of the glass stub can be tightly fitted. Mount the cork platform upon the steel spindle and make sure that it will be able to spin round very easily. Press four tacks into the cork, in order to provide supports for the various rods and other objects which will be placed upon the platform. These directions are clearly illustrated in Fig. 1.

Rub a vulcanite fountain pen with a piece of woollen cloth and place it upon your turntable. Run a comb through your hair and hold it near one end of the fountain pen and observe what happens.

The pen will move away, causing the turntable to rotate, because the two electric charges will repel one another. Two rods of plastic tubing, cut off an old hula hoop, will be ideal for this and many other experiments with static electricity. Rub a warmed glass rod with a piece of dry silk and place it upon the turntable, then rub a second glass rod with silk and hold it near one end of the first rod. Again repulsion will occur between the two charged objects. Now rub a fountain pen, or plastic rod, upon your coat sleeve and hold the charged pen or plastic near the charged glass rod upon the turntable. Attraction will occur!

These experiments will suggest to you that there are really two kinds of static electric charges. When we rub plastic, rubber, or vulcanite with fur or wool, we give a negative, electric charge to the object rubbed, whilst the fur or wool becomes positively charged. This is because all atoms are composed of evenly balanced numbers of positive electric particles, or protons, and negative electric particles, or electrons. Electrons can be rubbed off fur or wool on to plastic, rubber or vulcanite so that those substances may be given a negative electric charge. When glass is rubbed with silk, electrons are rubbed off the glass, so that the glass will have a deficiency of electrons and acquire a positive charge, whilst the silk is given a surplus number of electrons and becomes negatively charged. Positive and negative electric charges were given their names by the great American scientist, Benjamin Franklin.

Inflate a rubber balloon and rub it several times upon a woollen garment. It will now be possible for you to make the balloon adhere to the wall or ceiling. By rubbing the balloon you give it a strong negative charge of electrons. The electrons on the surface of the balloon repel the electrons in the atoms near the surface of the wall, so that the wall acquires positive charge. Thus attraction between opposite electric charges is the cause of the balloon sticking to the ceiling. This explanation will not be hard to understand if you pause to think awhile. It is great fun to cover the ceiling with rubber balloons in this manner. Note that any two charged balloons placed close together will be repelled and roll away from each other, across the ceiling.

Repulsion can be demonstrated, using a 2 in. wide long strip of newspaper. Fold the paper in two and hold it, just beneath

● Continued on page 276

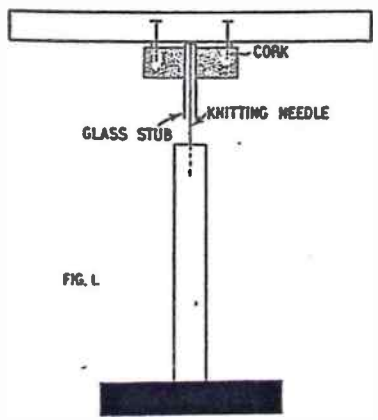


FIG. 1.

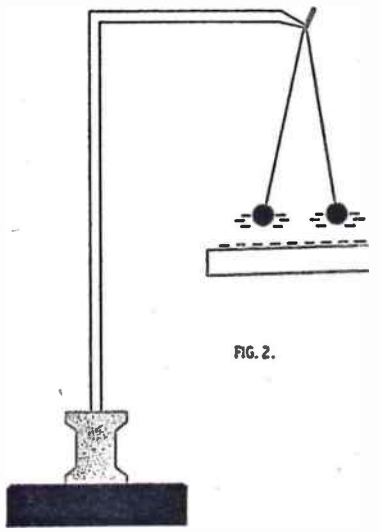
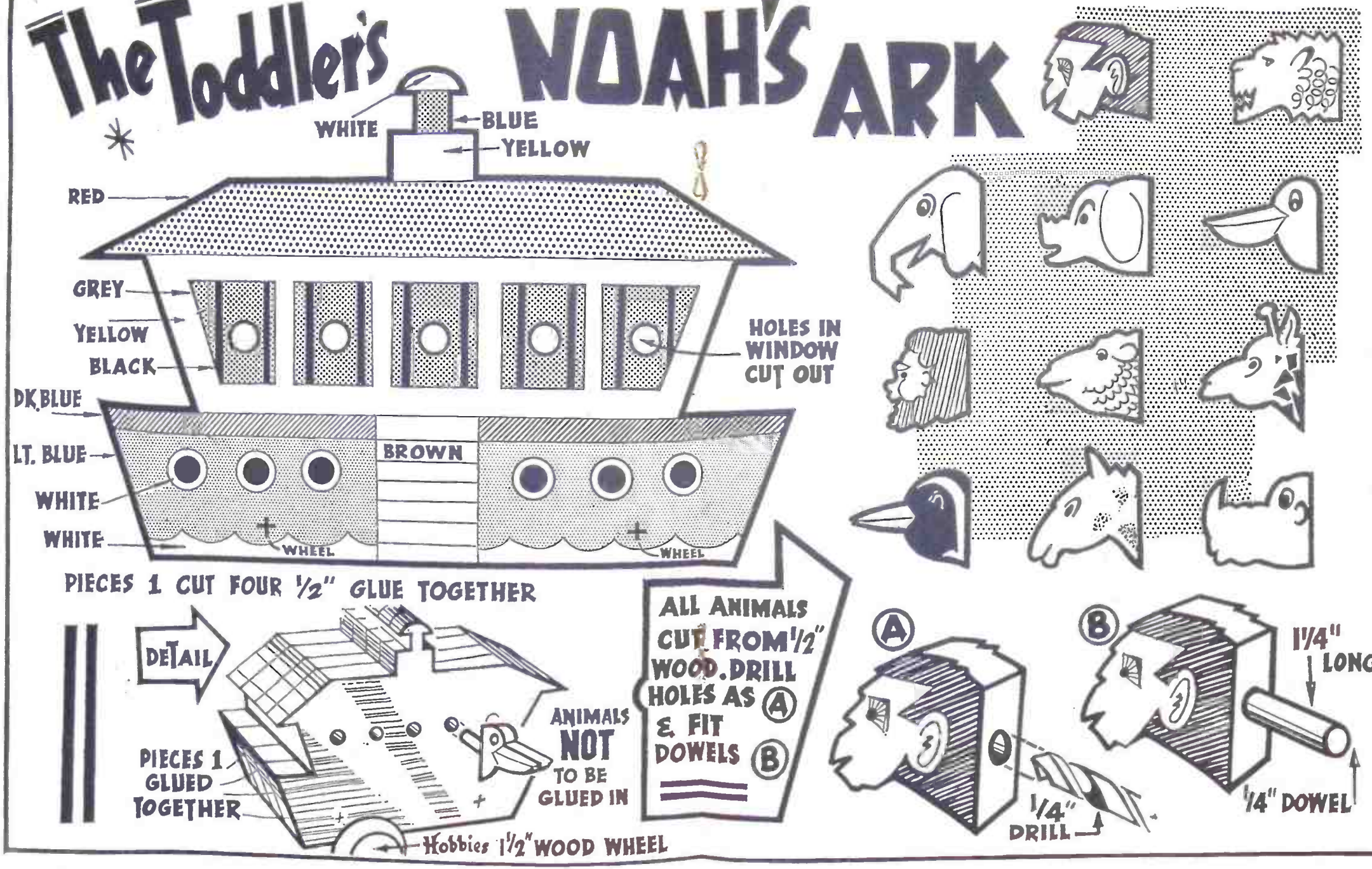


FIG. 2.

The Toddler's NOAH'S ARK



LAYING the stronger 7 by 1¼ in. joists is the first step in the actual construction of the room. It will be ticklish laying the first two; after that a gangplank can be laid across them, and succeeding joists, to facilitate a foothold.

4—FLOOR AND WALL SUPPORTS

The new joists are laid alongside the existing 4 by 2 in. joists. They are held together by screws. Three screws for each pair of joists will be sufficient. Drill clearing holes in the larger joists before laying.

On no account use nails. You will shudder the ceiling below, causing cracks or falling plaster. It is wise to use screws for all future fixings.

Remember, the joists must rest on the tops of internal walls or the wall plate of the main outside walls. The wall plate end of the joist should be cut at an angle to match the rafter slope. This ensures that the maximum under surface of the joist rests on the wall plate.

The next step is to fit the grounds of 2 by 1 in. deal. These grounds will eventually carry the short upright part of the wall panelling; the remainder continuing up the rafters to the ceiling.

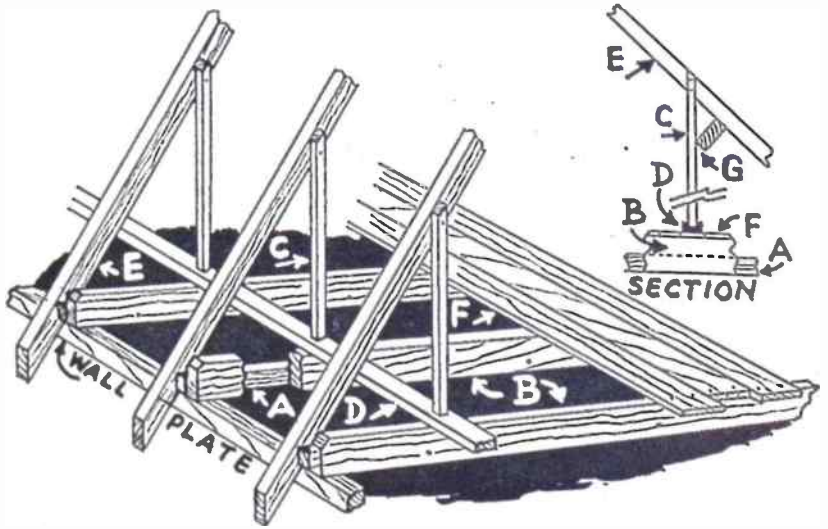
A 2 by 1 in. bearer plate is first fixed across the tops of the new joists at a point approximately 4 ft. from the wall plate. Into this are housed the 2 by 1 in. grounds (see section). Add a spot of glue to the housings. The tops of the grounds are screwed to the rafters, as shown. Be sure they are fitted upright.

In actual practice, the grounds will be fitted in front of the purlin (see section). It has been omitted from the main drawing for the sake of clarity.

Next, the actual tongued and grooved floorboards should be laid. Here again, use screws and not nails. Three or four boards should be placed in position, cramped up tight with a joiner's cramp, guiding pencil lines drawn across them in line with the joist centre below and finally held with two screws per board per joist. If joins have to be made in lengths of flooring they should be made down the centre line of a joist.

Before laying the boards, some thought should be given to the electric wiring needed for the completed room. Junction boxes are sure to be on view on the existing 4 by 2 in. joists. These can be tapped, but remember they most likely carry only a lighting circuit. They should not be tapped for power or heating until expert advice has been called in.

The point to remember is that wiring can be hidden tidily under the floorboards and behind the wall panelling to emerge just wherever it is needed.



POLYSTIK AS A BONDING AGENT

ONE of the lesser known, but none the less important, uses of Polystik as a bonding agent is in plaster and cement work, as it eliminates the necessity for hacking out or keying when repairs are being made. How to make a lasting and secure job of concrete and cement screeding, flooring, rendering and patching is contained in an informative pamphlet which can be obtained free upon request from the manufacturers Messrs. Croid Ltd, Imperial House, Kingsway, London, W.C.2

For the Bench Lathe

TWO USEFUL ACCESSORIES

By R. N. T. Burke

A MITRE attachment is a neat and easily-made extra for the circular saw, which is fitted to the Hobbies Lathes. It will be of particular interest to those whose pastimes entail picture framing.

Briefly, it is a metal plate (thin plywood will do, but aluminium, brass or steel are better) with a guide rail below, and a double-sided mitre block above (see Fig. 1). The wooden parts are fastened by countersunk screws. Needless to say, accuracy of construction is essential — the sides of the metal plate must be absolutely parallel, and the two oblique faces of the mitre block at 45° to the guide rail. The guide rail must not be too deep in order that it should clear the saw spindle, but otherwise measurements may be adapted to suit materials available.

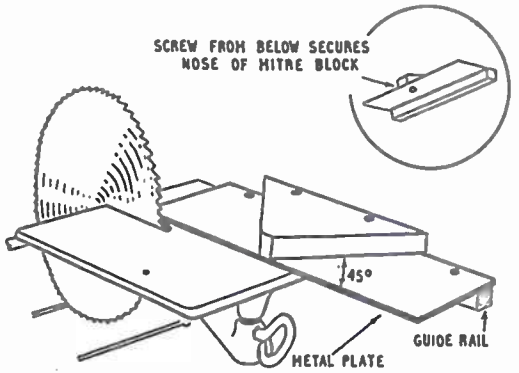


Fig. 1

To cut a mitre, set up the saw, mark the wood and (with the thumb and first two fingers) grip it to the attachment in such a position that the saw will make the required cut. Start the lathe and slide the attachment along the saw table, with the guide rail pressed gently to the edge. The device is reversible and can be used left- or right-handed. It is hardly necessary to add a warning to be careful not to mitre your fingers!

A sanding table with mitre guides can be made from any wooden box which is 6 in. deep or can be cut to this size. Use a carpenter's square to check that the box is true, and then pin guide rails to the work bench, so that when positioned by them one edge of the box is close to and parallel with the sanding disc. Make a mitre sanding guide, as shown in Fig. 2, and drill holes in the table to position it, bearing in mind that sanding with a table is normally done only on the descending half of the disc.

These two attachments will enable a quick, neat, and accurate job to be made of mitres, and the sanding table is useful as well for general work.

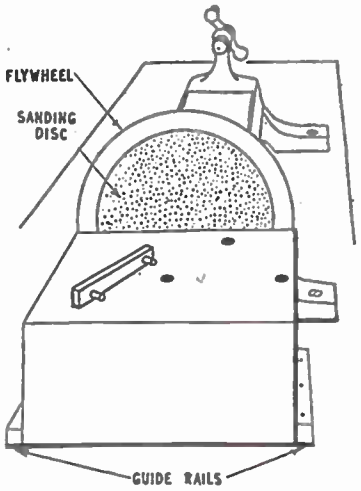
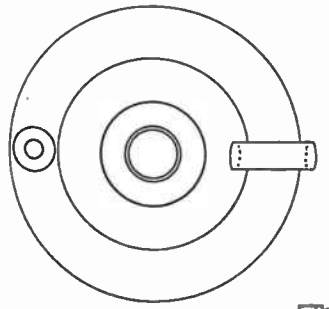
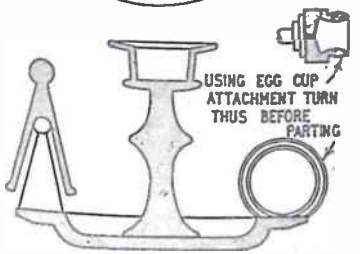


Fig. 2



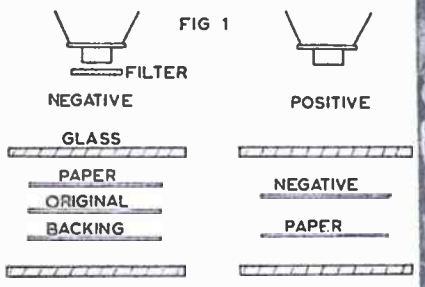


A NOVELTY CANDLESTICK AND SNUFFER

A MOST attractive and useful article to make on the lathe is this candlestick and snuffer. The base, 4¾ in. diameter, may be turned on the wheel arbor (as described in our 30th December 1959 issue), and dowelled to stick for finishing between centres. Turn snuffer between egg-cup bit and tail stock, and withdraw tail to finish off inside.

COPYING WITHOUT A CAMERA

OCCASIONS arise when a copy of a picture or photograph is required, and the normal process is to take a new photograph for the production of a negative. This can be particularly difficult, especially if the original is small, but by employing what is termed the reflective method we can make copies of diagrams, maps, line drawings in books, and similar illustrations, without having to use a camera, and in next to no time.



The reflective method of copying presents little trouble. You will require a contrasty grade of enlarging paper, some plate glass, a yellow filter, and some black paper.

We will assume that you wish to make a copy of a drawing from a book or magazine. This is opened at the appropriate page and the sheet of black paper placed underneath the illustration. It is necessary to ensure perfect contact between the page and the sheet of sensitized paper which is laid emulsion side down on the picture. This is achieved by placing a piece of stiff card or glass underneath the black paper and a piece of plate glass on top of the sensitized paper. The glass may be weighted down to ensure perfect contact, the whole arrangement being shown in Fig. 1. The essential point to note is that the sensitized paper is laid face down on top of the picture about to be copied.

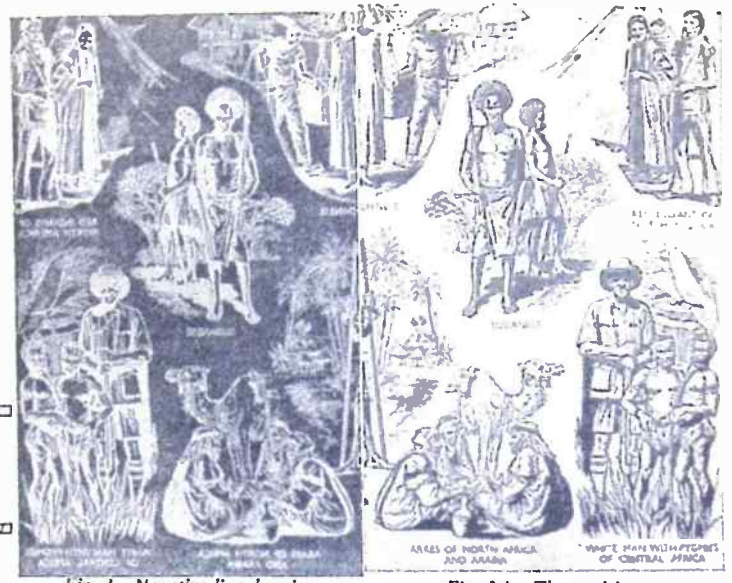


Fig. 3—Negative line drawing

Fig. 3A—The positive

If you use an enlarger as illuminant it is best to cover the lens with a piece of yellow celluloid or similar material. In fact the accompanying pictures were made with the aid of a piece of clear yellow wrapping obtained from a bottle of fruit juice. This is the 'yellow filter' and it can be temporarily held in position by means of a rubber band. It should be noted that while the new negative is made with the yellow filter the latter is not used for making a positive copy.

Exposure will vary with the strength of the lamp and the size of the aperture, and it is advisable to make a few tests. Fig. 2 shows the best way of making a test negative, the horizontal strips being exposed for 2½, 5, 7½ and 10 seconds respectively. When the positive is made the tests are vertical as in Fig. 2A, for 2½, 5 and 7½ seconds. This method not only gives the correct exposure time for the positive but also indicates which density will produce the best results. Make suitable notes on the back of these test prints for future reference, including details of light and the distance between light and the paper. Here a 60 watt lamp was used.

Once the exposure has been made and

● Continued on page 284

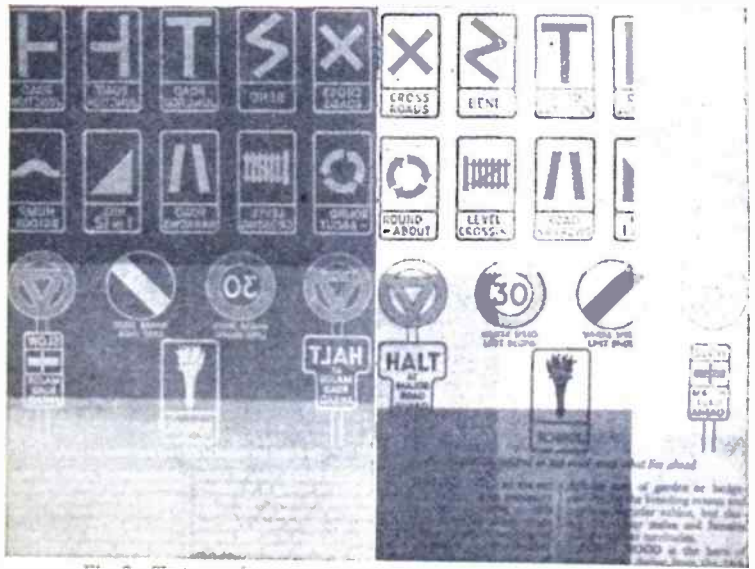


Fig. 2—Test negative

Fig. 2A—Test positive

A Holiday Snapshot Album

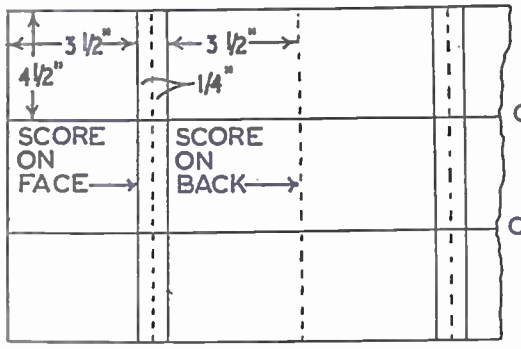
HERE we describe how to make a novel pocket album for your snapshots. The leaves are made from long strips of paper folded and pleated, so that no sewing or lacing is necessary, and the album is suitable for either of the popular 2½ in. square or 2¼ in. by 3½ in. sizes.

You are advised to use a good quality paper for the leaves, and it is suggested that you buy a sheet of pastel paper from a stationer's shop. This will be approximately 20 in. by 30 in., will only cost a few pence, and you may either use a pale grey or a pale buff colour, neither of which will show fingermarks. These tints also supply a neutral background for your pictures.

Reference should now be made to Fig. 1, where you will see that the pages are 4½ in. deep and, after allowing for the pleat, are 4 in. wide. Ultimately the pleat is glued together, and compensates for the slight thickness of your pictures. The unbroken lines in the diagram represent score marks on the surface of the paper, while the dotted lines should be scored on the other side, and these will help to make straight folds.

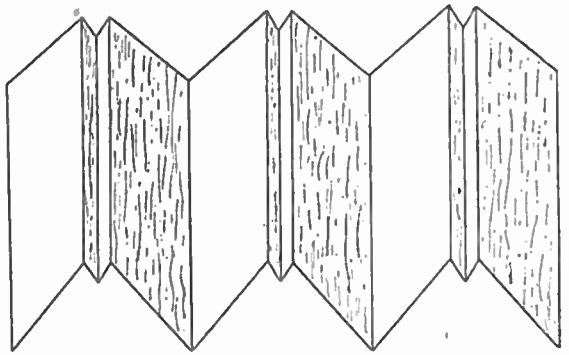
In Fig. 1 you will see we have marked out the large piece of pastel paper. It is quicker to score the whole sheet in this way, cutting into 4½ in. strips, as indicated, and then folding into pleats and pages. Use a blunt pointed instrument for the scoring, such as a wooden skewer.

FIG 1



When folded, we produce a long strip of paper, as shown in Fig. 2, and to extend this strip further to enlarge the album we attach a second or third strip. Note that this extension must be made by making a gummed joint at a pleat.

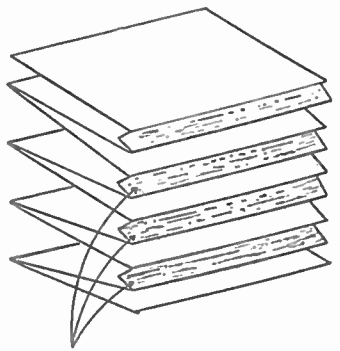
FIG 2



The last stage of making the pages is shown in Fig. 3, and all that is necessary is for gum to be applied between the pleats. When this has been done, leave under pressure for some time until perfectly dry, and you will have a series of pages.

All that remains is to add a cover, for which you will require two pieces of cardboard measuring 4½ in. by 4½ in. — a fraction larger than the leaves — which are covered on the outside with either the same pastel paper as the leaves or fancy cover paper. A spine of pliable material should be glued on before the cover, and the thickness of the combined album leaves should be measured to determine the correct width. With the covers so prepared, glue the front and back pages to the insides of the cover. (S.H.L.)

FIG 3



GUM PLEATS ONLY

● Continued from page 282

Copying without a Camera

the print is developed as usual you will have a direct copy negative, as shown in Fig. 3. The print is fixed, washed, and dried, and we are ready for making a positive if required. At the same time the negative so made can be 'read' by transmitted light, that is, holding it up to the light and looking through the back, or with the aid of a mirror.

When we are to make a facsimile copy of the original the procedure is modified, and it should be remembered that we use the paper negative in exactly the same way as a normal one, that is, by printing through same. Lay a sheet of unexposed paper on a piece of plate glass with the copy negative on top, the sensitized surfaces being in contact, and a further piece of plate glass covering the whole, as in Fig. 1. Figs. 3 and 3A are examples of line drawings copied from a book. We again make tests, unless you have a master test print like that shown in Fig. 2A, and ultimately expose without the aid of the yellow filter. Any number of copies may be made in a similar fashion.

This method will be found most useful for the rapid copying of black and white pictures, printed matter, and the like. When copying a picture made on thin paper, or tracing paper, a sheet of white paper instead of black should be placed underneath. When the original is reasonably opaque no backing paper is necessary.

Maps, diagrams, text, and pictures from books can be copied far more accurately and with less strain by this simple method.

Care and use of Hacksaw Blades

NO handyman's tool kit would be complete without a hacksaw for cutting metals, plastics, and other hard materials. The efficiency of a hacksaw depends largely on the state of the blade, and in order to get good service from your blades they must be properly used. Unfortunately, too many handymen misuse their hacksaw blades unintentionally, and this often leads to broken blades — and bad tempers. For better results, therefore, here are a few tips well worth noting.

Hacksaw blades are manufactured in various lengths, having different tooth pitches. The normal tooth pitches are 14, 18, 24 and 32 teeth per in., and it is important that blades having the correct tooth pitch are obtained for each job. A blade having fine teeth is not suitable for cutting soft materials, as the teeth soon get clogged up. Conversely, a coarse blade is unsuitable for hard materials, as they do not produce sufficient 'bite'. The table will serve as a guide in choosing the correct type of blade for the various jobs.

It is important that blades are fitted to hacksaw frames and properly tensioned. All hacksaw frames are provided with adjustable tension screws to enable this to be done. If there is insufficient tension on the blades they will buckle when used, and ultimately snap. On the other hand, if too much tension is applied, breakage will normally occur at the holes.

Hacksaw blades are made so that they cut in one direction; the forward stroke. It is important, therefore, to ensure that the blades are fitted in position the correct way round. The blades should be fitted so that the teeth are pointing away from the handle.

When using a hacksaw always use full strokes to ensure that all the teeth are made to do work. The hacksaw frame should be held with both hands to keep it in an upright position; this helps a uniform cutting pressure to be exerted throughout the full cutting stroke. The tilting of a hacksaw frame when in use can result in breaking the blade.

By Finlay Kerr

Sometimes a blade loses its bite because its teeth have been stripped; that is, the points have become blunted. This is usually the result of having insufficient teeth in contact with the metal. Always ensure that at least three teeth are in actual contact with the metal. The reason for this is illustrated in Fig. 1. At A the pitch of the teeth is too great for the thickness of metal being cut, so that only one tooth is in contact at a time. Thus, as the blade is drawn to and fro the points of the teeth are harshly brought into contact with the corners of the metal and get knocked off. At B, however, a finer blade is used which prevents the points of the teeth striking the corners of the metal. When cutting thin sections of metal a broader cutting surface can be obtained by sawing at an angle, as shown in Fig. 2. This also allows the use of a coarser blade.

If the blade should break in the middle while cutting through a piece of metal do not resume sawing in the old saw cut with a new blade. This practice often leads to subsequent breakages. The proper procedure is to turn the metal over and start afresh on the other side.

It is useful to know that hacksaw blades are generally made from two different types of metals, carbon steel and high-speed steel. The latter type is the more economical in the hands of an experienced hacksaw user, but it is a much more expensive type of blade to buy than those made from carbon steel. To avoid undue expense, therefore, it is probably advisable for the home handyman to use carbon steel blades at first until he becomes accustomed to the use of a hacksaw, then he can switch over to the more expensive high-speed steel blades which are more efficient.

Finally, it's no use purchasing good blades and knowing how to use them properly if your hacksaw frame is not also of good quality and design. The most popular type of frame is probably the tubular steel type which has a sliding handle that can be adjusted and locked to suit the various lengths of blades. Also, remember to choose a frame with a bit of weight behind it. You will find this much easier to handle.

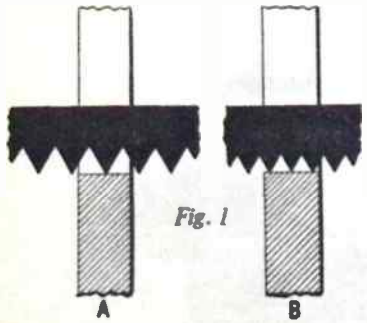


Fig. 1

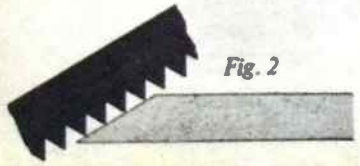


Fig. 2

TYPES OF BLADE

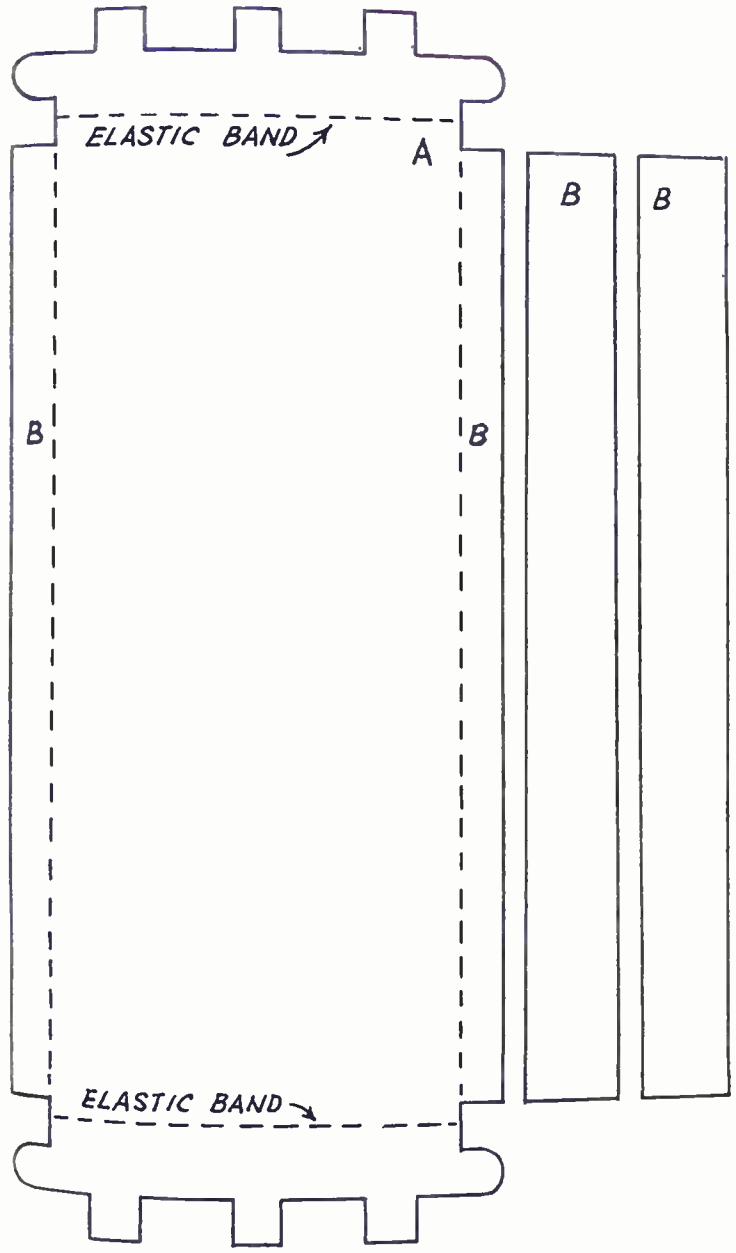
Material to be cut	Recommended number of teeth per inch
Aluminium	18
Angle Iron — Heavy	18
Angle Iron — Light	18–24
Asbestos	14
Brass	18
Bronze	18
Cable (electric)	18
Case Hardened Steels	
up to ¼ in.	24
¼ in. to 1 in.	18
Cast Iron	14
Conduit Tubing	32
Copper	18
Cycle Tubing	32
Mild Steels	
up to ¼ in.	24
¼ in. to 1 in.	18
Nickel Chrome Steel	
up to ¼ in.	24
¼ in. to 1 in.	18–24
Piping:	
Steel and iron	18
Brass	24
Sheet Metal	
18g and thinner	32
over 18g	24
Stainless Steels	
up to 1 in.	24
1 in. to 3 in.	18–24

'Camping Sites in Britain'

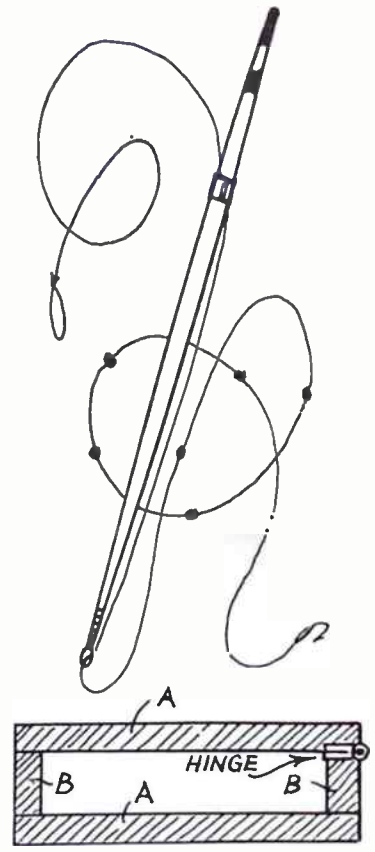
THIS first issue will be of considerable assistance to those people who prefer to spend their holiday camping. Generally a lot of correspondence is entered into prior to the holiday, and doubts arise as to the suitability of prospective sites. Here are details of sites in all parts of the British Isles and Eire, giving charges per day or per week, as well as facilities available.

Published by Messrs Cade & Co. (Publications) Limited, 11 Old Bond Street, London, W.1 — Price 3/-.

A CAST BOX FOR ANGLERS



PROTECT your floats, and keep casts intact by making this handy box. Cut two of A and B from ¼ in. wood with a fretsaw. Glue pieces B to one piece A and then hinge the remaining piece A on top. Give two coats of paint and the box is ready for use. The cast is wound round the notches, lengthwise and is held by an elastic band at each end. (M.p.)



Printed by BALDING & MANSELL, LTD., London and Wisbech, and Published for the Proprietors, HOBBIES LTD., by HORACE MARSHALL & SON, LTD., Temple House, Tallis Street, E.C.4. Sole Agents for Australia and New Zealand: Gordon & Gotch (A'sia) Ltd. For South Africa: Central News Agency Ltd. Registered for transmission by Canadian Magazine Post.

Single seat and two seat

CANOES

COMPLETE AND READY FOR THE WATER — OR IN KIT FORM TO MAKE YOURSELF

THE PBK 10 SINGLE SEATER

These popular craft are designed by that well-known authority, P. W. Blandford. With canvas skins, they are propelled by double-bladed paddles and are thoroughly at home on lake, river or canal — or even on the sea in experienced hands. They are offered as complete canoes, or as specially prepared kits, which include full building instructions. Easy terms are available, subject to the completion of a simple form of Agreement.

PBK 10

Single seat — 11 ft. long
28 in. beam — load 300 lb.

COMPLETE CANOE (without paddles) CASH PRICE **£24.5.0** (part p. & p. £2 extra), or EASY PAYMENTS £6 DOWN (plus £2 part p. & p.) & 6 monthly payments of £3.4.8.

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Two seater — 15 ft. long
32 in. beam — load 700 lb.

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