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FOR ALL
HOME CRAFTSMEN

★ *FREE Design* *Supplement*

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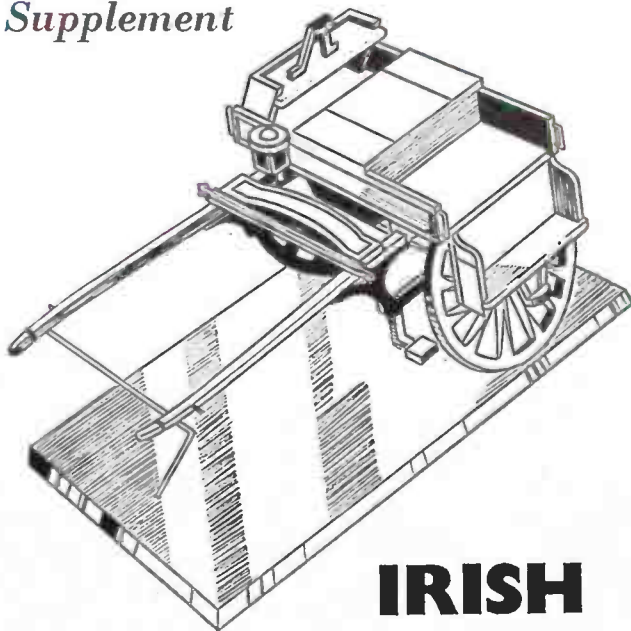
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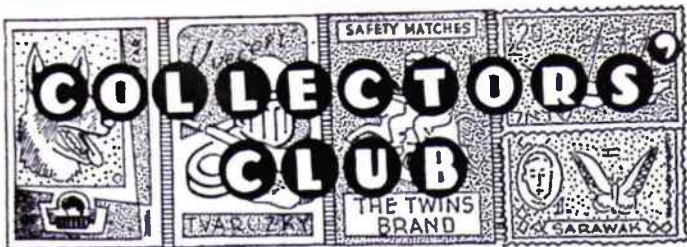


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5^D



CADENCY, otherwise called 'differences', in the language of heraldry, denotes certain signs employed to distinguish the several sons of the head of a clan, or family, which are borne on the escutcheon in perpetuity by the representative of each house. Of these differences there are nine.

The daughters of the house use no differences on their coats of arms, which are blazoned on a lozenge instead of a shield. They all hold the same rank as that held by the eldest son during their father's lifetime, having precedence of all younger brothers and their wives, and taking their place next immediately after the eldest son's wife. This status of theirs will be recognized in view of the fact that the daughters of an earl are styled 'The Lady so and so', just as the eldest son is 'Lord so and so'; while all the younger sons and their wives are styled 'The Honourable'.

Differences began to be adopted about the time of Richard II.

The Prince of Wales alone, amongst the Royal Family, has a distinct coat of arms; those of all the Royal Princes and Princesses are alike. The latter are distinguished the one from the other by special charges emblazoned on the several depending points.

Dragon and Lion

The dragon and the wyvern are amongst the most ancient crests in England. A crowned lion was first assumed by Edward III. That of Coeur de Lion was a plume of feathers surmounting his helmet, and of Richard II a lion on a 'cap of dignity'.

In the fourteenth century the 'cognizance' or 'crest' began to be 'emblazoned' surmounting a 'wreath'; otherwise a coronet, a 'cap or maintenance', or a 'mural crown'.

It has been asserted that the crest is a personal 'bearing' only, and not hereditary, like the coat of arms on the shields; but early and common usage pronounce the crest to be hereditary also. At the same time the signification of the arms on the shield is regarded by the heralds as complete without the crest.

Alexander the Great wore a ram's head, to indicate that he was the son of Jupiter Ammon, who was represented

with the same crest. Julius Caesar adopted a star, to denote that he was descended from Venus; but sometimes he wore a bull's head, an elephant, or a she-wolf, that animal having suckled Romulus and Remus. In the early crusades the Christians wore a cross darting forth rays, adopting the same emblem for their shields and banners.

HERALDRY—5

Crests were worn long anterior to that of escutcheonal arms, or, at least, until such became hereditary. A noble of the first or second class succeeded to the latter by birth, whereas at first he could only obtain a crest as a knight in actual service. They belonged essentially to the person of a military commander, and thus it is easy to understand that a lady, whose birthright it is to wear and use the arms of her family, could have no right to use a crest — a prohibition obtaining to this day.

The earliest record of the Royal grant of a crest dates from 1335, when Edward III conferred an eagle on William de Montacute, Earl of Salisbury. A lion statant guardant was that of the warrior king himself. Some five years later (about 1340) Sir Geoffrey de Louterell wore a fan-like crest covered with birds, such as formed the charges on his shield, and Roger de Quincy, Earl of Winchester, wore a wyvern.

Double purpose wreath

The crest was always placed on a wreath, or cap of maintenance, or arose out of a coronet or mural crown. The most common foundation was the wreath, which was formed of two or six large skeins of silk, or strips of ribbon, twisted together, composed of different colours, and serving the double purpose of an ornament and also for the protection of the head from the blow of a mace or a sword-cut. When blazoned in heraldry, they were tintured with the principal metal appearing on the coat of arms. The first ribbon, or coil of silk, represented the metal, the second the

colour (or painting), the predominant metal and colour appearing alternately. The earliest known representation of a wreath is to be seen at Elsing, Norfolk, engraved on the memorial brass of Sir Hugh Hastings, 1347.

The cap of maintenance or of dignity was an ancient form of hat worn by dukes, formed in the soft crown of scarlet or crimson velvet, and with a stiff brim turned up with fur. This very frequently served as a foundation or support for the crest, instead of a wreath. The brim extended at the back in two points. The origin of the name is traced to the cap which Pope Julius II sent to Henry VIII with a sword and the title of 'Defender of the Faith' (because he 'maintained' the cause of the Roman Church in a clever work against Lutheranism).

In French this cap was called the chapeau, and was originally worn by royal and noble personages on state occasions, one such being carried before a monarch at a coronation, and in those times it was a symbol of special honour and dignity.

Sometimes a coronet takes the place of the cap of maintenance, the wreath, and the mural crown, and when employed as a charge, it takes the form of a ducal coronet, only without a velvet cap within it. A crest-coronet must be carefully distinguished from those that are the insignia of princely or noble rank.

The mural crown was of early Roman origin (corona muralis), and constituted one of the highest military decorations. It was of gold, and surmounted by turrets (muripinnis), awarded to the first warrior who scaled the walls of a besieged city. The technical term in heraldry — turrets — does not mean a small round tower, but the usual finish on the summit of a fortified building, which often surmounts machicolation, or the hollows supported by arched brackets, down through which melted substances (such as boiling lead) were poured on the assailants. Most readers have seen battlements surmounting such machicolation in the ancient castles of England, and, apart from the latter, on the square towers of many of our old churches. Being, therefore, representative features of fortified towers or turrets, through the openings of which the archers and crossbowmen used to fire on the enemy under cover of the battlements, the emblem of distinction to the knight or soldier who first scaled the fortified tower was termed 'turrets'.

These articles have covered the more interesting features of Heraldry — as applied to hobbyists — who will find many appropriate facts depicted on stamps, chess labels, match covers, etc. And don't forget to check for errors — 'missing or inverted flagstaff', etc. etc.



'I FIND painting very economical' began Ken Dodd.

'In what way?' I queried. 'Just look at my hair: I never need to buy a paint brush', smiled Ken.

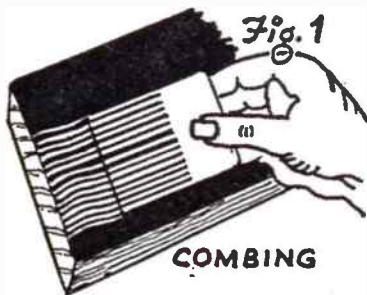
Then he became serious. 'Joking apart, Mr Capper; I'd like to have a go at this imitation graining. Is it very difficult?'

I was able to assure Ken that even he could do it.

Basically, the principle is first to apply a ground colour of a flat (not a gloss) paint, corresponding to the lightest part of the grain you wish to imitate. Over this, when dry, is brushed on, lightly, an oil stain, called a scumble, and which is chosen to represent the dark colour in the grain. Then a short stiff-haired brush or a graining comb is drawn over the surface to leave alternate lines of light and dark as in real graining.

Your local colourman will assist you in the shades of flat and scumble you will need. For instance, maple will require a very light buff ground colour, whilst a chestnut will require quite a dark ground.

Practise on a scrap of smooth wood. Apply two coats of the ground colour if necessary. The scumble is in paste form.



A GRAIN OF SENSE FOR KEN

★ 'What's this imitation graining all about?' asks Ken Dodd, the famous comedian, who has brought laughter to millions of homes by way of television.



Dilute it with 1 part linseed oil and 1 part turps, and a little driers. Mix to almost water consistency. If too fluid, add a little whitening powder.

You can make your own scumble from raw umber, raw sienna, ground in oil. Add a little ivory black for really dark grains.

Apply the scumble lightly and brush right out. This is important. Applied too thick, a series of minute ridges will be left. Work fast, covering a large area at a time. Now, comb over the area, as shown in Fig. 1. Hold the tool at about 15 degrees angle. Wave it as you comb.

The comb is made from tempered steel and costs around 1/6. You can make your own, by cutting prongs with shears, from a sheet of metal.

For a lighter grain, use an old brush instead of the comb. You can also try a combination of the two. Remember to run the grain as it would in its natural state. You have furniture around you for guidance. The exception is door panels, which can be done across from opposite corners if desired.

Figure graining

In Fig. 2 we see how figure graining is done. The ground colour and scumble are applied as before. The graining is done with a piece of ordinary indiarubber. Here again, copy from the furniture around you.

A nice effect is obtained by first brushing or combing the scumble, and then applying a little figure work. You can purchase special rubber tools for producing swelled growths and other effects. Better to do it yourself, however; it is more fun.

Don't, however, overdo the effect. And never put in knots. After all, you would not buy furniture showing knots!

The top scumble surface will remain workable for quite some time. If, there-

fore, you execute some graining and then find you do not like it, brush over it with the dry scumble brush, merging the scumble into the light lines of graining that are showing. Then, re-grain.

When finished and dry, a coat of general purpose varnish should be applied over the grainwork. It gives it depth and sheen; the finished professional look.

BOOKS TO READ

Numismatics

THIS latest issue in the very popular 'Teach Yourself' range of books, makes interesting reading for all those hobbyists who collect or study coinage. Written as an alphabetical guide, it is in simple language and easily understood. To make a study of coinage is to make a study of world history, and this non-technical book for the beginner will help the reader to improve his knowledge in a most interesting manner.

'The Teach Yourself Guide to Numismatics' is written by C. C. Chamberlain and published by The English Universities Press Ltd. — Price 7/6.

'Hi-Fi and Stereophonic Sound'

HERE is a book which, in simple terms and without technicalities, explains many of the baffling problems that the layman meets when faced with the terminology of High Fidelity Sound and Stereophonic Sound. Laurence Mallory has written especially for the beginner who seeks enlightenment on this modern aspect of recorders and recording, and covers many of the snags that the layman is likely to meet on entry into this field.

Published by Elliott Right Way Books, Kingswood Buildings, Kingswood, Surrey. — Price 7/6.

A RUBBER-DRIVEN UNICYCLIST

JOINTED toy figures which move, when activated by a type of spring, will always give pleasure. Young and old alike are fascinated by the antics of a 'mechanical man'. The toy described here has been re-designed after the style of a popular Victorian plaything, and is in the form of a little man mounted upon a unicycle. Youngsters will be enthralled by the realistic pedalling actions of the precariously-perched cyclist as he steers, in perpetual circles, round a wooden pillar. The toy is operated by the 'springiness' exerted by a tightly twisted rubber band as it freely unwinds.

By A. E. Ward

Begin by making the frame of the unicycle. For this, you will need an 8 in. length of very strong $\frac{1}{2}$ in. wide strip metal. Use a vice to grip the metal while you tap gently with a hammer to fashion a sharply angular U-shape with 'prongs' 3 in. and 4 in. long respectively. Bore $\frac{1}{4}$ in. diameter holes in the middle of the frame in positions $\frac{1}{2}$ in. from each end. Bore a third $\frac{1}{4}$ in. diameter hole in the longer prong exactly opposite the hole in the end of the short prong. Two similar holes must now be bored in the base of the U-shape, which will, in fact, be the upper part of the frame. Fig. 1 will further clarify these instructions.

Cotton reels can be utilized to make the cyclist's body. Secure a 'fat' reel to the 'seat' of the frame by means of small screws, and glue a sawn-off 'slender' reel on top of this, to serve as neck and shoulders for the figure. A large bead may be glued upon the neck, in order to provide a head for the figure. Arms can be cut out of stout cardboard or thin scrap wood, and then glued into place.

The 'pillar' around which the cyclist rides is merely a $2\frac{1}{2}$ in. length of $\frac{1}{2}$ in. diameter dowel rod, which is firmly inserted into a straight-sided hole cut in the centre of a heavy base block. Convenient dimensions for the base block

will be 4 in. by 3 in. by 1 in. You will require a fairly tall cotton reel to fit loosely over the slender pillar. Bore a hole straight inwards, towards the middle of the cotton reel, near one end, into which a 10 in. length of $\frac{1}{4}$ in. diameter dowel can be glued securely. Use a small screw to join the end of the longer prong of the frame to the dowel 'supporting rod'. Of course, you will need to bore a narrow hole into the end of the dowel, before inserting the screw, in order to avoid splitting the wood.

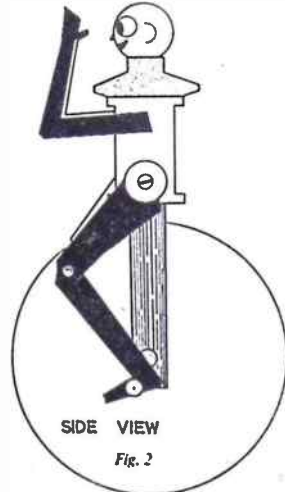
Cut out a 4 in. diameter wheel from 3 ply wood, using a fretsaw, and make the rim of the wheel smooth by means of fine grade glasspaper.

A careful study of Figs. 1 and 2 will enable you to assemble the moving parts of the toy without any difficulty. The sections of the legs may be cut out of metal from a discarded tin, using an old pair of scissors. In each section bore two small holes in the positions indicated.

Choose a straight piece of stout wire with which to make the pedals and wheel axle. Use pliers to bend it into shape, but do not fashion the outer pedal at this stage. Bore a minute hole through the centre of the wheel. Next, cut out three little cylinders of $\frac{1}{4}$ in. dowel, and bore similar minute holes through them. Mount the pedal-axle upon the frame, as illustrated in Fig. 1. Note that there are small beads on each side of the frame, on the outside, and that a pair of the wooden cylinders grip the wheel in the centre of the axle. The wheel and its supporting cylinders

should be glued together, and the whole arrangement should be very tightly mounted upon the axle, so as not to rotate unless the axle itself turns. Bend into shape the outer pedal.

Thread the feet into position upon the pedals, and 'place' the third wooden cylinder upon the end of the outer pedal. Join the segments of the legs



together at the knees by means of small paper fasteners, the ends of which may be cut off in order to achieve neatness of appearance.

Prepare two more wooden cylinders, each $\frac{1}{2}$ in. long, through which you must bore holes to take narrow 1 in. long screws. Fasten the upper parts of the 'thighs' to the body by means of washers, screws, and the wooden cylinders, as clearly shown in Fig. 1. Now, when you turn the wheel of the unicycle, the revolving pedals should activate the legs of the rider, to simulate pedalling motions. Make final adjustments to ensure that the parts move freely upon one another.

Power for action is supplied by a length of $\frac{1}{2}$ in. wide strip rubber, which is bent double and tied firmly to form a long rubber band. This you must 'thread' between the wire loop on the inner pedal and a large staple which is driven into the top of the supporting dowel rod. Your toy will now be ready for its working trials.

Wind up the rubber 'motor' by turning the outer pedal backwards, thread

Continued on page 185



THE usual open-wired hanging cage is quite suitable for the budgerigar. It should, however, be at least 18 in. by 12 in. in size.

By all means hang it in the window if you wish, but don't expose your pet to long hours of strong sunlight. And do keep it out of draughts. In the evening, remember that heat rises, and your bird will suffer over too strong a heat from, say, a gas fire. Your bird will become tamer more quickly if it is on a table near at hand to your favourite chair.

Better from the bird's point of view, but not so attractive, is the made-up rectangular box cage, with a bought wire front affixed. It gives the bird a sense of security, and is more draught-proof.

Food and water pots should fit inside the cage, and not outside. Avoid those where the bird must push its head through a hole to get at its food. More than one bird has had its head stuck, and suffocated. Make sure the door catch is secure. The inquisitive budgie soon recognizes the door's function, and tries to open it.

Particularly important are the perches. They should be oval, of various sizes, none of which should be less than $\frac{1}{2}$ in. diameter (see Fig. 1). Much damage is done with small pencil-thick perches. Nature provides that when the bird sits and falls asleep it cannot fall off the perch, as the foot muscles are brought automatically forward in a locking

position. As it rises, the weight is taken from the legs. Too small a perch means that the bird cannot release its hold. At the worst, it can break its leg.

Have the perches well spaced out, so that the budgerigar can get occasional wing practice.

The cage should have a removable tray. It should be cleaned thoroughly twice a week, and wiped over with a damp cloth lightly charged with disinfectant. The cage can be placed out of doors on dry warm days. But bring it indoors before the evening chill arrives.

Taming

A finger-tame bird is half way to being

2—CAGES AND TAMING

able to talk. Do not rush the process. The bird, when first placed in the cage will probably mope. It misses the company of other birds. It may also get a little panicky when first placed in the cage. Therefore, remove all the perches for half the day.

A bird six weeks old will come readily to hand, but older birds will need persuasion. Start the training in a darkened room or place a cloth over the top half of the cage. Do everything slowly. Place your hand in the cage, high up, and bring it down slowly to the bird's head, and endeavour to tickle it.

If the bird flutters, keep your hand perfectly still until the budgerigar perches again. Repeat the process until the bird raises no objection. Do not make too many attempts at once, particularly if you are not having too much success. Better to leave it until next day, and start again.

All the time, murmur softly 'Pretty Joey' or some other birdie language. You will have succeeded when the bird not only raises no objection, but lifts its head up as your finger approaches. The next step can now commence.

Press your finger against the lower portion of its breast, so that the bird is forced to step upon your finger. It will probably step back on to the perch immediately, but persevere until the bird is quite happy to remain on your finger. After a while try moving the bird around the cage, still on your finger.



Continue to talk to it all the while. Gradually increase the light in the room or raise the covering on the cage.

Only when the bird comes readily to hand should it be allowed out of the cage. And do take some precautions. Cover all open fires with a guard, close the doors and windows, and cover up the mouths of vases. Flying into windows is another menace. Overcome it by first taking the bird to the window and letting him touch it with its beak.

Remember, the bird cannot actually talk; it can only imitate sounds. You should start, therefore, with very simple phrases of two or three words, before you start on a nursery rhyme. And here, always teach the succeeding lines of the verse, prefaced with the lines before it. (E.C.)

Continued from page 184

A Rubber-Driven Unicyclist

the supporting cotton reel upon the pillar, and set down the toy upon a smooth floor or table top. As the rubber unwinds, the cyclist will pedal furiously round the pillar in a most amusing manner. Further minor adjustments may be necessary. One final detail will be to glue little pieces of strip rubber to the four corners of the bottom of the base block, in order to prevent the base block from slipping owing to the force of reaction resulting from the motion of the toy.

It will be found most convenient to paint the various parts of the toy prior to assembly. Bright and gay colours should be chosen, and the little rider should be given a cheerful face. You will not regret the time spent on constructing this toy well, and you will certainly be rewarded by a great deal of enjoyment.

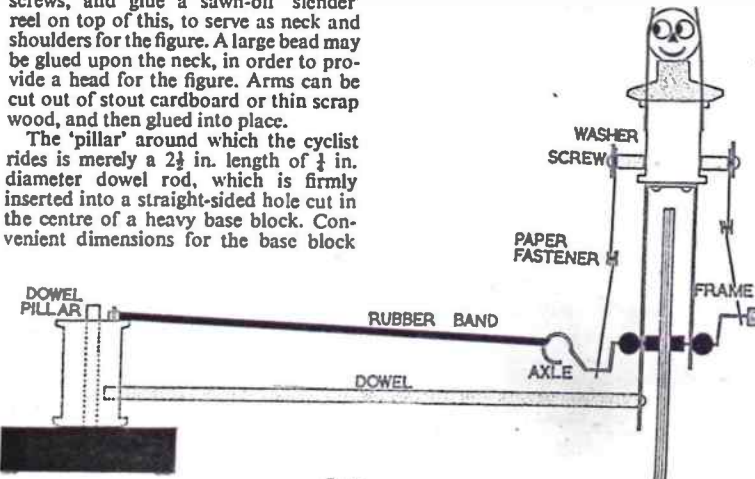
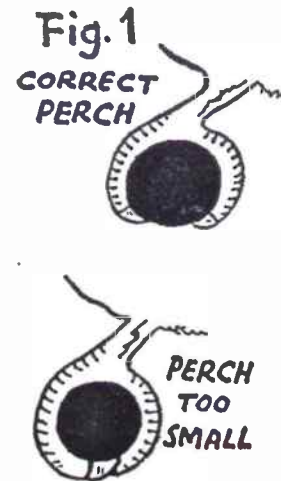


Fig. 1



FINISHING THE 'HYDRO-SWIFT'

IN the previous article we had completed the basic structure for the hull of the hydroplane. The next step is the fixing of the top-decking on the nose and on the rear of the hull.

Mark out the shape of the nose top-decking on to fairly thick Bristol Board or similar smooth-surfaced card and cut it out. Bend it over the rims of the front bulkheads and check that it fits neatly along the edges of the hull sides and round the rims of B5 and B1. Trim where necessary. Coat the curved rims of the nose bulkheads and the top edges of the hull sides with contact adhesive (such as Evo-Stik), and similarly coat those parts of the Bristol Board which come into contact with the bulkheads. After ten minutes smooth the top-decking into place (Fig. 5).

By
Gordon
Allen

It is possible that you may have to trim the centre piece, or even the middle pieces, so that they fit properly. On the other hand, according to various discrepancies in individual structures there may be small gaps between the pieces. Fill these in with narrow strips of $\frac{1}{8}$ in. balsa.

When thoroughly set, shave away all the ridges on the covering, and glass-paper the entire sheeting until it is satin smooth. Fill in any gaps or channels, including those between the junction of

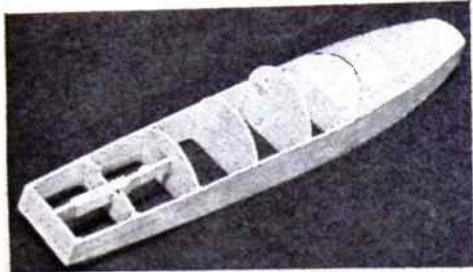


Fig. 5—Nose top decking and and engine bearer in place

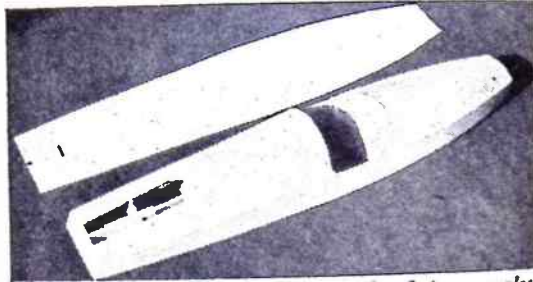


Fig. 6—Bristol Board hull base ready for fitting complete with rudder post platform

The rear top-decking consists of five shaped pieces of $\frac{1}{8}$ in. medium hard balsa — shown shaded at the bottom of the plan. Cut these out and trim true. Using balsa cement, fix the two side pieces to the rims of B6, 7, 8, 9, and to the top edge of B10; also along the top edge of the hull side-pieces. Do not attempt to fix each piece in one operation. Start at B6 and B7, and work towards the rear, two bulkheads at a time. In a similar way fix the two middle pieces and the single centre piece.

the decking and the hull sides, with plastic balsa. This can be bought or small quantities can be made by mixing balsa dust with balsa cement. Rubbing the edge of a piece of balsa against rough glasspaper will soon provide ample 'dust'. When set, shave flush, and glasspaper smooth.

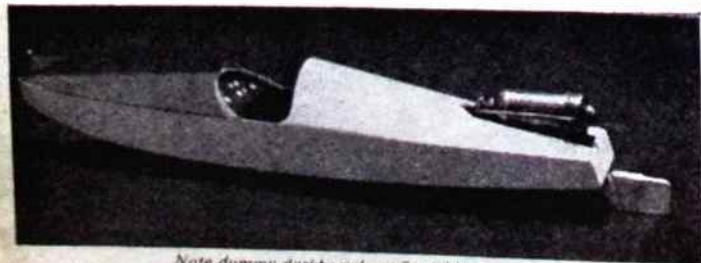
The bottom of the hydroplane is cut from thick Bristol Board. Place the hull on such a piece of board and trace round its outline with a sharp pencil. Mark the slot at the rear end and cut out

the entire shape. As shown in the detail on the plan, glue a piece of $\frac{1}{8}$ in. hard balsa (using contact adhesive) over the slot, so that it is $\frac{1}{8}$ in. short of the rear edge of the hull bottom. This acts as a platform for the rudder post (Fig. 6). Fix the hull bottom in place with contact adhesive and trim the edges flush with the hull sides.

The boat's nose is made from a block comprising two pieces of $\frac{1}{8}$ in. balsa stuck together with their grains opposed. Alternatively the block may be made up

of laminations of thinner balsa. Mark the shape of the nose in side view on thick paper and, when cut out, use this as a template to cut the block to shape in side view by pasting it, temporarily, to the balsa. Do the same with the plan view shape. Now cement the block to the front of B1, and when thoroughly set, carve the nose to shape, so that it follows the contours of the hull nose. Finish with fine glasspaper.

Cut the rudder and rudder-post from $\frac{1}{8}$ in. hard balsa (made by laminating two pieces of $\frac{1}{8}$ in. sheet with the grains opposed). Round off the front edges of the post and the rear edges of the rudder. The drawing shows how the brass tubing is bound to the rudder post with twine or thread. This forms a bearing for the piano wire which is bent round the edge of the rudder, and is likewise held with twine. Coat the unit with two applications of cellulose cement, then fix the post to the platform in the hull bottom with contact adhesive.



Note dummy dashboard cut from black paper.

MODEL MAKER'S PAINT BOX

ASSEMBLING models from plastic kits has become very popular. The excellence of these models depends, after assembly, upon painting, and the enthusiastic model maker will require quite a large number of paints of various colours, and a number of brushes. A box to contain these paints, solvents, brushes and palettes is a very necessary part of his equipment.

By C. Franklin

Such a box can easily be made from two pieces of wood with a top and bottom of plywood. The paints are sold in various containers, but the modeller will probably use those contained in either a small round metal tin, $1\frac{1}{4}$ in. diameter by $1\frac{1}{4}$ in. high, or glass jars $1\frac{1}{4}$ in. diameter by 2 in. high.

The following details are given for a box to contain up to eight metal tins of paint, with two holes for solvents.

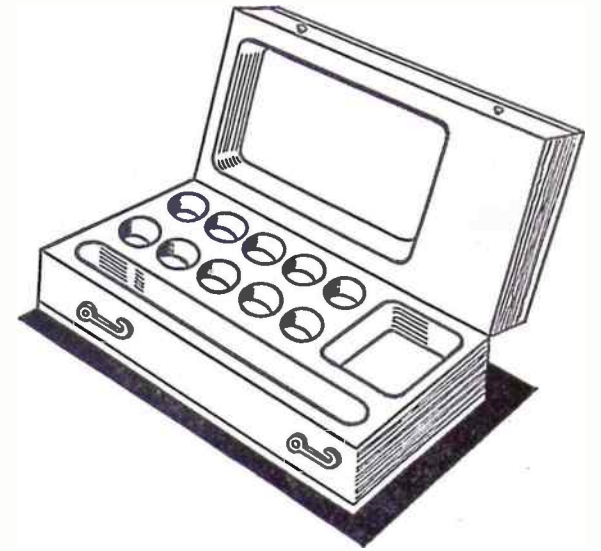
Obtain two pieces of one of the harder woods, 10 in. long by $4\frac{1}{2}$ in. wide. One piece should be 1 in. thick (base) and the other $\frac{1}{2}$ in. thick (lid). Mark out the base as shown and bore holes $1\frac{1}{4}$ in. diameter. Cut out sections for palettes and brushes. Cut out a hole 7 in. by 4 in. in the lid section as shown. The width of the hole can be reduced to 3 in. if no tall object is to be stored in the brush section.

Clean and glasspaper these sections

and cramp together to finish off the outside faces.

Select two pieces of $\frac{1}{8}$ in. thick plywood, 10 in. long by $4\frac{1}{2}$ in. wide, and glue to top and bottom sections, cleaning up the edges when dry.

Stain and polish the box and join the two sections with two small brass hinges, with two small catches and eyes at the



front. It is neater to replace the eyes with small round-headed brass screws, allowing the catches to fasten over them.

The box has been designed so that all boring can be done with a $1\frac{1}{4}$ in. diameter centre bit, including the corners of the palette, brush and top sections. If a box is needed to contain a larger number of paints, the length can be increased accordingly, or the width increased to take a third row of holes.

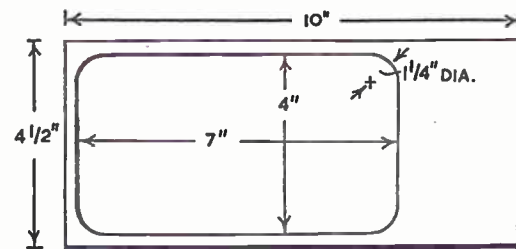
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FINISHING THE 'HYDRO-SWIFT'

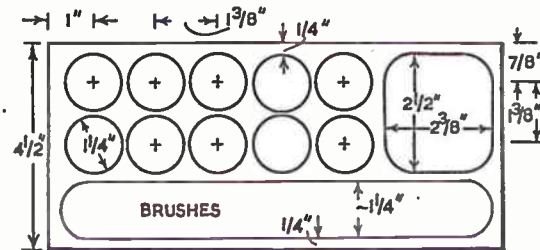
Give the entire boat, including the bottom, three coats of thick banana oil, waiting until one is dry before applying a subsequent coat. Also glasspaper the hull between each coat. Then apply plastic enamel (Humbrol was used on the original) to the entire model.

Finally, cut the windshield from clear flexible plastic, reinforce the bottom edge (see detail) with a strip of Bristol Board $\frac{1}{8}$ in. wide fixed in place with contact adhesive, and glue the completed shield to the face of B5 adjoining the top-decking.

To complete the model, screw the motor clip in place as indicated, and fit a pennant, cut from coloured gummed paper, and fixed to a long modelling pin.



PLAN OF LID



PLAN OF BASE

Concluded on page 187

Instructions for making

AN IRISH JAUNTING-CAR

THE Irish jaunting-car is, as its name implies, a vehicle used particularly for pleasure excursions and sightseeing trips. Traditionally Irish, this lightly built and well-sprung vehicle has two wheels and is pulled by a single horse. The passenger seats are placed lengthwise back to back over the wheels and travellers are thus within easy earshot of the jarvey or coachman, whose witty comments and stories make up much of the fun when 'jaunting' along in this beautiful country. These cars are in much use around the lovely Killarney district, and in fact have by no means been entirely superseded by

(pieces 13) will later be fitted, are shown by dotted lines on piece 1 on the design sheet. When adding these pieces to the underside of the body, make sure they are fixed the right way round, as shown in Fig. 1.

Leave this section to dry thoroughly and carry on by making up the two passenger foot-rests. Details of their assembly are shown on the design sheet by gluing together two pieces 10, one piece 9 and one piece 11 for each foot-rest. Mounting steps also hang from these rests. They comprise pieces 15 and 16, and are glued underneath pieces 11. The completed foot-rests will later be

A KIT FOR 7/3

Hobbies Kit No. 3366 for making the Irish Jaunting-Car contains panels of wood in their correct thicknesses, wire, round rod, etc. Kits, price 7/3, from branches or from Hobbies Ltd. Dereham, Norfolk (post 1/6 extra).

added the springs (pieces 14) also seen in Fig. 2. The main illustration shows where the driver's mounting step is added to a spring at the front. This step is made up from pieces 17 and 18.

Other additions across the shafts under the driver's feet are pieces 20 and 21, while piece 19 is glued across the shafts at the back of the cart. The positions of these pieces are shown by dotted lines on pieces 13 on the design sheet.

Details of the makeup of the lamp, consisting of pieces 24, 25, 26 and 27, are

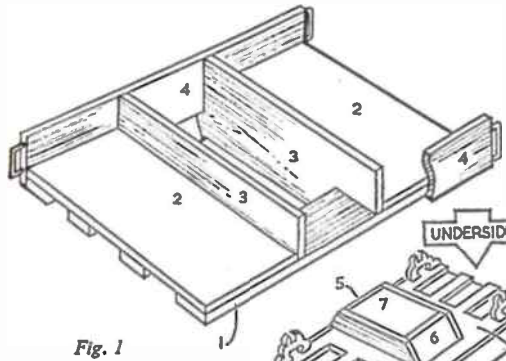


Fig. 1

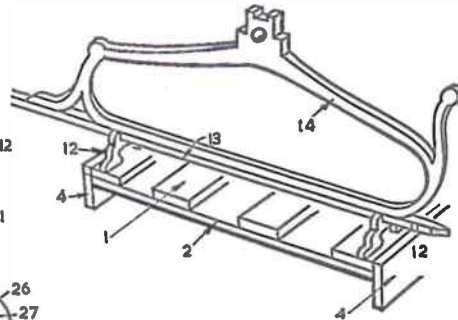


Fig. 2

diesel trains and luxury motor coaches.

Our design for this characteristic vehicle should prove of immense interest to modellers, particularly those who have travelled in the Emerald Isle. The model is about 11 in. long and 5 in. high, and is intended to stand on a base. The gay colourings which can be added for the finish will do much to make this a most pleasing subject.

All the parts which go towards its makeup are shown full size on the design sheet. These should be traced and transferred to their appropriate thicknesses of wood by means of carbon paper, then cut out as accurately as possible with the fretsaw and cleaned up well with glasspaper.

The assembly can be started with the main seating area of the cart by assembling the pieces, as shown in Fig. 1. All parts are glued together throughout, and a view of the underside is also shown to indicate how the pieces are joined together. The positions of the four pieces 12, into which the shafts

hinged to the body with pieces of sticky tape, as in the actual vehicle they can be raised out of the way, depending upon the number of passengers carried. Sometimes, in fact, when driving solo, the driver sits sideways in one of the passenger seats.

Returning to the seating section, add the shafts and undercarriage. The two shafts are glued first of all into the cut-out section provided in pieces 12, as seen in Fig. 2. Note that there is a left-hand and right-hand shaft, with the forward ends turning inwards. To the shafts are

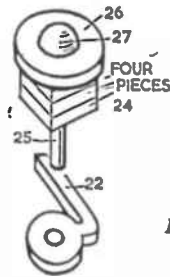


Fig. 3

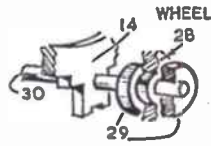


Fig. 4

shown in Fig. 3. Piece 22 serves as the holder in which the lamp is supported, and it is glued to the cart on piece 1 in the position shown by dotted lines on the design sheet. The mud flaps (pieces 23) are glued underneath the back of the cart at an angle sloping outwards and in line with the wheels.

The central well of the cart is covered by a top (piece 8) which is cut in three pieces. The outside sections are glued in place on pieces 3 and 4, and the middle section is hinged with tape to give access to the well, which is presumably used for storage purposes, besides providing a seat for the driver and a back rest for the passengers.

The wheels (pieces 28) should be cut

as accurately as possible and the spokes rounded with knife and glasspaper. Insert the axle (piece 30) through the holes in pieces 14, and to each end add the washers (pieces 29) then the wheels (28) and finally the other pieces (29) which form the hubs (Fig. 4).

Small pieces of wire are fashioned for the mounting hand-grips, as shown in the finished illustration. The ends are filed to a point and pushed into the ends of pieces 4.

The base for the model consists of an 11 in. by 5 in. panel of 1/4 in. wood to which the wheels are glued. The model is kept level by the addition of a wire rest for the shafts fixed in the base. Small pieces of wire are also pushed into the outsides of the shafts for the attachment of harness strips, as seen in the finished illustration.

A suggested colour scheme is — green for all seating and other panels, with a fine line of yellow all round, and a

final edging of black. Shafts, springs, and wheels can be yellow, with black tips to the shafts. The wheels normally have rubber rims. This can be suggested by carving and painting grey or gluing a strip of rubber or cord around the circumference. The hub caps and axle should be black. A model of a horse harnessed between the shafts would add to the interest.

Attractive Pipe Cleaner Novelties

ALL kinds of attractive novelties can be easily and quickly made from pipe cleaners which can be bought in different colours at small cost. They are made from pliable wire covered with fabric, and will bend into any desired shape.

In our illustration we show a novelty fashioned like a winter sports enthusiast, a skier, but you will soon discover that after forming the basic shape of the body, with a little modification of the trimmings you can fashion footballers, dancers, cricketers — or what you will.

Reference to the diagrams will reveal the procedure. In Fig. 1 it will be seen that we use four pipe cleaners as a basis. Two each make the legs, two for the head, and one each for the arms

after bending appropriately. Start as in Fig. 2 by wrapping a cleaner round the body about midway, and if possible using an entirely different colour. In this instance, four white cleaners have been used for the body, while green cleaners were used for the 'clothing'. The body is wrapped upwards by winding the wire round and round for about 2 in., when a cleaner at each side is bent at right angles to the arms. The two latter should be turned back a little at the ends to make a loop. This not only shapes the hand but also permits us to push a stick through the loop if required.

Continue to wrap the arms, as shown in Fig. 3, using more cleaners until only the hand remains, trimming away any surplus wrapping wire with scissors. The remaining wires for the head may be too long, but these may be either trimmed or folded back to make a more substantial head before wrapping with a coloured cleaner.

The other arm should be completed in the same way, starting from the centre and working towards the hand. Open out two wires for each leg, wrapping from the centre downwards, as shown in Fig. 4, as far as desired. Bend the feet at right angles, and the figure is almost complete. Note that there is sometimes a slight difference in the lengths of pipe cleaners, and you will have to use your own judgment on the ultimate length of the limbs; but they should be proportionate unless your aim is an exaggerated, grotesque figure. Although unnecessary, you may sew in a few stitches to represent the mouth and eyes, using appropriate thread.

The skis are made from two pieces of cardboard 3/8 in. wide and 4 1/4 in. long, cut to a point at the front end, and turned up a little. The pipe cleaner feet will adhere quite firmly if a good adhesive is used. A simple hat was made from

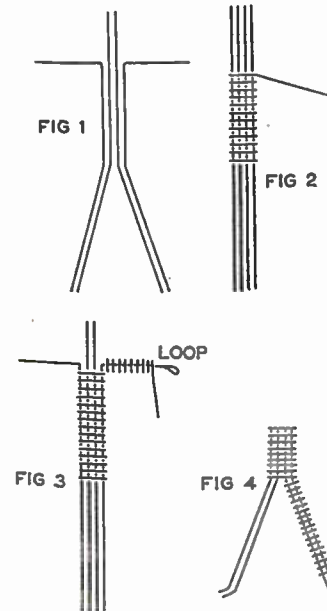


white paper cut out from a disc, formed into a shallow cone glued together, and then attached to the head of the figure with a touch of glue. A pipe cleaner is then inserted in each hand — through the loops described earlier — which can be tightened up if necessary with a pair of pliers.

Perhaps we should mention that the posture of the figure is decided and accomplished before fitting the accessories, and you will find that the body, arms, and legs are quite substantial, but will bend to any curve, angle or shape. You can thus make a footballer standing on one leg in a kicking posture, or a tennis player in the act of making a smash drive.

In our model we have used the pair of skis as a base for the novelty, but you can use a small disc of cardboard for the two others mentioned.

(S.H.L.)



CHEMISTRY AT HOME

THE popular idea of iodine is of a deep brown liquid of strange smell and with an antiseptic, if painful, action on cuts. The familiar 'iodine' is really a solution of iodine and potassium iodide in alcohol.

True iodine is very different. It is a purple-black crystalline solid with a metallic lustre and a pungent odour. It is an element and one of the halogen family, which comprises fluorine, chlorine, bromine, iodine, and the rare member astatine. Like its fellows, it is very reactive, as we shall see.

It unites directly with many metals to form iodides. Iron filings and iodine will readily show this. Powder 4 grams of iodine and put it in a wide test tube, such as a boiling tube, together with 8 c.c. of water. Add gradually 2 grams of iron filings. After each addition, mixing should be effected by making the hand holding the tube tremble.

The iodine begins to dissolve as soon as the first lot of iron is added and the brown liquid becomes hot. Let it cool somewhat before adding another portion of iron. When all the iron has been added, let the whole stand with occasional agitation until the liquid loses its brown colour. Filter the solution into a small bottle.

A green filtrate consisting of ferrous iodide is obtained. Put 1 c.c. into a small evaporating basin and 1 c.c. into a test tube. Into the bottle put a small pinch of iron filings and cork well.

With the 1 c.c. in the evaporating basin, try to obtain the solid salt by evaporating on the water bath. The solution turns brown and gelatinous and smells of iodine, indicating that decomposition has occurred.

Leave the solution in the test tube to stand overnight. It turns orange-brown. This looks suspiciously like oxidation to a ferric salt. Put a drop on a glass slip and add a drop of potassium ferrocyanide solution. It turns blue, indicating that a ferric salt is, indeed, present.

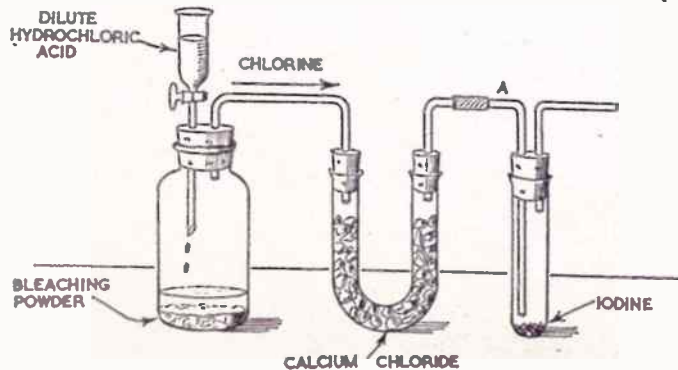
EXPERIMENTS WITH IODINE

These two experiments show that ferrous iodide is unstable. Now examine the bottle. This will have remained green. The iron filings prevent the ready oxidation and the salt may be stored thus for some time in solution.

Iodine also unites with zinc. Again put 4 grams of powdered iodine and 8 c.c. of water into a boiling tube. Add in very small portions 2 grams of zinc dust, agitating constantly with the tube mouth turned away from you.

The first additions of zinc produce little apparent change, but suddenly the iodine goes entirely into solution and the liquid grows so hot as almost to boil. Allow it to cool and proceed with the very gradual zinc addition and agitation, letting the whole cool between each addition. Let the brown solution stand with occasional agitation until it becomes colourless. Filter and evaporate to dryness. Put the zinc iodide into a screw-cap bottle while it is still warm.

An interesting experiment is to put a



little on a watch glass and leave it aside. First it deliquesces. This is why the salt should be bottled while still warm. The substance later becomes brown from liberation of iodine. It must therefore be kept dry, and an extra precaution is to fit a rubber disc inside the screw cap of the bottle.

Iodine also reacts with other halogens. The action of chlorine on iodine readily illustrates this. Rig up the apparatus shown in the diagram. In this we generate a regulated stream of chlorine in the bottle by dropping dilute hydrochloric acid on to bleaching powder ('chloride of lime'), dry it by passing it through calcium chloride in the U-tube and then lead it to a boiling tube containing iodine crystals. As chlorine is poisonous, rig the apparatus in the open air.

When the chlorine comes in contact with the iodine the latter begins to change to a reddish-brown liquid. When liquefaction is just complete and all the iodine has disappeared, stop the chlorine generation by turning off the hydrochloric acid drip stream at the tap tunnel and dismantle the apparatus.

Blow down tube A to remove excess chlorine from the tube. The liquid in the boiling tube is iodine monochloride. By cooling it by standing the tube in cold water the iodine monochloride will usually solidify. This change also frequently takes place merely by standing for a time. You will note it has a pungent odour.

Put a little in water in a test tube. The water decomposes it and iodine appears. Test the liquid with blue litmus paper. It is reddened, showing an acid to be present. This decomposition, in fact, produces two acids. Namely, iodic and hydrochloric acids.

If you wish to keep the remainder of the iodine monochloride, use a glass-stoppered bottle, since it attacks cork. It is also corrosive to the skin, and care should be taken not to touch it. Should you do so, bathe the finger with dilute hydrochloric acid (one volume acid to one volume water), then flush with water and finally dab on a cream of sodium bicarbonate and water.

Let us now try the action of chlorine on iodine in the presence of water. Put about 0.5 gram of powdered iodine into a test tube together with 2 c.c. of water. Generate the chlorine as before but leave out the U-tube and pass the gas direct into the water in the test tube. The iodine gradually disappears, yielding an orange-coloured solution. Remove the test tube as soon as all the iodine has disappeared.

On testing the solution with blue litmus paper you will find it is reddened, indicating the presence of an acid. In

● Continued on page 192

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Hints for photographers

WORK IN THE DARK ROOM

WITH brighter days ahead, cameras will be clicking, and negatives piling up to be printed. To most enthusiastic amateurs that means sessions in the darkroom with the enlarger. Not many of us are fortunate enough to possess a separate darkroom, we have to make do with kitchen or bathroom. And the time and effort of 'blacking out', etc., can be considerable. We want to make sure the time we spend in the darkroom isn't further frittered away by the production of faulty, disappointing prints. We have to keep a check on our darkroom habits.

1. Cleanliness — from dishes to enlarger. This was dealt with fully in an article of 30th July 1958 — sufficient now to repeat that lack of scrupulous cleanliness in workmanship causes troubles and faulty prints.

2. Stray white light. Any white light reaching the enlarging paper will cause some degree of fogging, depending upon its intensity and the time the paper is exposed to it. Assuming the safelight used IS safe, extraneous white light can only come (if room is blacked out securely) from the enlarger itself.

Testing for leaks

Main sources of light leaks are the lamphouse and the negative stage, particularly the latter. Few negative stages in enlargers ARE perfectly light tight even with the negative inserted, but it may not reach the danger point; to test yours, place a cap over the lens, a coin on a small piece of unexposed enlarging paper on the easel — and switch enlarger on for a little longer than your average exposure time. If fogging occurs, a definite white patch will show on the paper where the coin lies when the paper is put into the developer. This is a similar method to that used to test the safety of the 'safe' light — the enlarger is then, of course, switched off to leave only the safe-light on.

Once satisfied that your negative stage is not a source of danger, care must still be taken — to fill the frame 'hole' completely with the negative to be enlarged. This is particularly necessary when using a smaller negative in a large frame size — say a 2½ in. sq. negative in a negative stage with an aperture for a 2½ in. by 3½ in. negative. In such cases you must use a mask so that light passes only through the negative area. Similarly, a badly placed negative in a frame of the correct aperture size will let white light stream past its edges to the easel.

Just how white light getting past the

negative edges can degrade the tones of a print is often not believed — until a test is made, one with the negative properly masked or completely filling the negative-stage aperture, and the other with white light straying past to the easel. Such a test will convince you.

This danger of light getting past the negative area applies even if the projected image is much larger than your sheet of printing paper, so that the white light falls well away from it on the easel: the nearer it is to your paper the more

By E. G. Gaze

fogging will occur. And if you use a masking frame to hold the paper on the easel, and the white light strikes that, then it will be reflected to the paper edges: apart from some level of general fogging, this can cause an unsuspected effect — it causes light-spread at the edges of the print, the degrading of high lights appearing as a slight blurring effect as though the negative detail were not sharp. This is most noticeable if the detail at the print edge is of high contrast, almost black and white — make a test and see.

In the same way, a long exposure with a very thin negative will cause light-spread over the whole image, even when general fogging isn't easy to pin down — the print seems blurred as well as fogged. A good print has sparkling high-lights and contrasting shadows, anything tending to degrade tonal values, to blurring the contrast line makes for a disappointing print.

A final word of warning on stray light. It's sometimes relaxing to smoke your pipe or cigarette when printing — watch out for the glow, weak though it may be, close to unfixed prints. And, if you don an apron to save your clothes from chemical spillings, remember when you stand by the easel during an exposure that whatever light is coming from lamphouse or negative stage may be reflected off a white apron to the easel. A small point — but lots of small points all add up to something!

3. Sorting negatives out before the darkroom session begins saves time peering at them in the light of your safe-lamp. Time is saved if they are sorted out beforehand into thin, and dense, and normal, particularly if you have only one grade of paper in stock — or only one size of paper in stock and you feel that some negatives will print more effectively

whole plate, some half plate and so on.

Careful amateurs do not keep their negatives in the original roll form — this leads to dust marks and scratches — they keep them in proper negative envelopes or albums, protected from dust, scratches and finger marks, when not in use. It is convenient to use the type of storage envelope or album that allows a strip of two or three negatives instead of single ones: the longer length of film lets you manoeuvre the negative more easily in the enlarger for exact positioning without fingers coming so easily into contact with the picture area and leaving marks.

Lastly, if you have a stock of printing paper left over from last season, its sensitivity may be reduced by old age — you can minimize the risk of disappointment of muddy print tones by adding some developer improver to your solution (such as Johnson '142' Developer Improver).

Some folks find it difficult always to judge print tones in the light of a safe-lamp, and find themselves turning out batches of prints that are too dark or too light over-all: it helps if you find this trouble to have an exposed, developed and fixed old print of satisfactory tone values in the darkroom as a comparison standard for a normal print on the grade of paper you are using.

Continued from page 190

Iodine Experiments

fact, there have been formed iodic acid, hydrochloric acid and iodine trichloride, the last producing the orange colour.

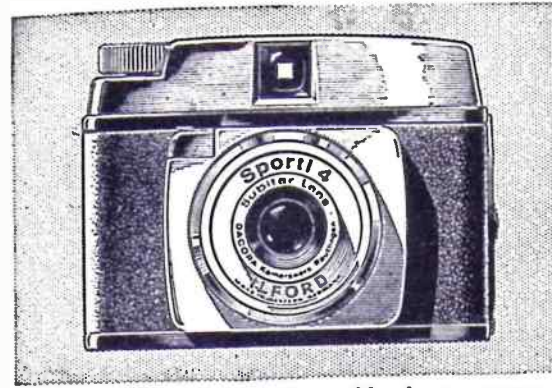
While the chlorine generating bottle is at hand, collect a little of the gas in a small narrow bottle. As it is heavier than air, simply insert the delivery tube into the empty bottle. With this you can carry out a mysterious conjuring trick.

Nearly fill a tall bottle or measuring cylinder with water, add a few c.c. of starch paste and a crystal or two of potassium iodide. The liquid looks like water. Take the apparently empty bottle (the greenish-yellow colour of chlorine will not be conspicuous in the small narrow bottle) and invert it over the starch/potassium iodide solution.

The surface immediately turns blue. Close the mouth of the vessel and invert it. The whole of the liquid turns a brilliant blue!

The explanation is that chlorine liberates iodine from potassium iodide and the iodine reacts with the starch to produce the blue colour.

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ADD TREES TO YOUR LAYOUT

MOST scenic models are greatly improved by the addition of a few trees placed in well selected positions. A great many model makers visualize a certain amount of difficulty in the making of realistic trees and therefore tend to omit them.

When approached in a sensible manner, however, no difficulty should be experienced, and you should be able to create suitable subjects to enhance the appearance of your layout.

By A. F. Taylor

There are two principal ways of making your trees and both can be equally effective. One method is to make up a framework of wire to form the trunk and branches, and then covering the latter with a suitable material to represent leaves. The alternative is to use the actual branches from trees or shrubs, but in a miniature version.

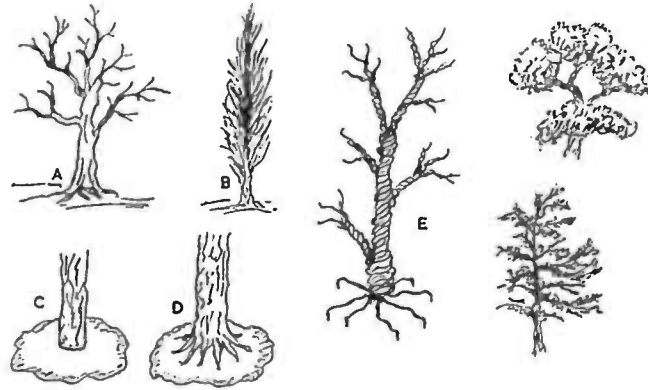
Let us first have a look at the foundation of all trees—the trunk and branches. The oak (A) is a bold, massive type which occupies quite a large space, while the elm is somewhat similar in a taller and less bulky manner.

Where space is rather cramped and a slender model is called for, try the Lombardy poplar (B). Firs and pines, too, are more of this type, and can be made to look very attractive.

Branches and twigs from all kinds of trees and shrubs can be selected and used for the foundation, or if you are making a winter scene, then they will not want any leaves added. When you have chosen a suitable branch it must be mounted on a neat base. This should not be too large, but just sufficient to hold the tree firm. To appear realistic the base is best cut with an irregular edge, which should be bevelled off, also in an irregular manner. Cut off the end of the branch squarely and fix it to the base with cement (C), and a panel pin put through the base and into the stem will hold it secure.

It looks rather a crude job if left in this state, but by using a little Pyruma or similar type of cement a very realistic trunk with its roots running into the ground can be made. When the cement has dried it can be painted in natural colours. A rough appearance may be given to the ground by first coating the baseboard with glue, and sprinkling sand or sawdust on to it.

Wire is very useful if you are unable to



obtain the natural article. Any gauge can be used and mixed to give thick and thin branches. The diagram (E) shows how the wire is twisted to form the branches and roots. The ends of these are turned over at right angles and pushed into the baseboard to hold the tree secure.

The appearance of the twisted wire trunks is very effective for rough barked trees such as oak and elm, but when the smooth type like the beech are wanted, then natural branches are more in character.

Having completed the foundation it now remains to clothe it in an appropriate manner, and this is a most interesting part. A study of different kinds of trees and their formation will help in getting a realistic effect.

There are heaps of materials which are suitable for making the foliage. Cut up into pieces they are fixed on to the branches and twigs of the trees with cement or they may be tied or wired on. Pieces of sponge, obtainable from fine to coarse, will supply the many grades for a

number of interesting foliage types. The loofah found in many bathrooms provides another form but with a coarse texture. Both the sponge and loofah pieces will need dyeing to the correct shade before they are used, but you will find this quite easy with standard dye powders.

Cotton wool, too, is a very useful material, and when dyed can be fluffed out and fashioned in many ways to produce some attractive and realistic foliage formations. The many forms of plastic foam can also be used successfully. Then there are several kinds of moss which when dried will supply fresh types of foliage.

Some dish and pan scourers are made of materials which are quite suitable for tree foliage, and might be just the thing you are looking for.

All these materials can be cut and shaped quite easily with scissors and affixed to the trees with cement, wire or cotton, and the result may turn your layout from just an ordinary piece of handiwork to a work of art.

'Instructions to Young Model-Makers'

THE concise and copiously illustrated step-by-step instructions given in this new book by Mr Guy Williams will help the least skilled to achieve quick success in model-making. The models dealt with vary from very simple ones in paper to quite elaborate constructions in wood or metal, and include houses, vehicles, ships, aeroplanes, model railways, theatres, etc.

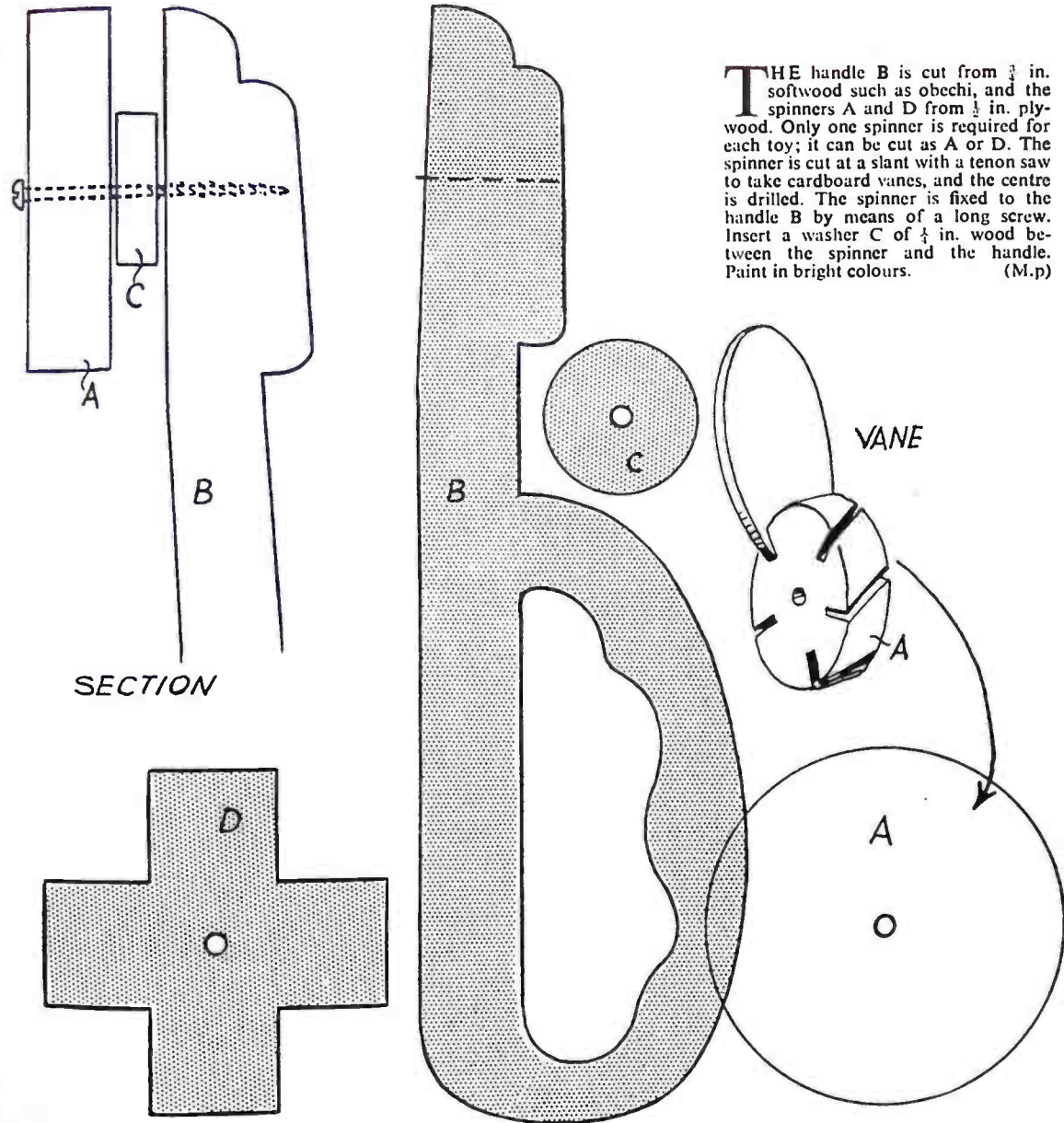
Although primarily for the beginner, confirmed model-makers will no doubt

find items that will enable them to extend their scope.

Model-making is, in general, considered as a hobby. It must, however, be emphasized that with increasing skill and experience, it can become a very profitable pastime or even a worthwhile vocation.

Published by Museum Press Ltd, 26 Old Brompton Road, London, S.W.7, and costs 12/6 net.

MAKING TOY WINDMILLS



THE handle B is cut from $\frac{1}{2}$ in. softwood such as obechi, and the spinners A and D from $\frac{1}{2}$ in. plywood. Only one spinner is required for each toy; it can be cut as A or D. The spinner is cut at a slant with a tenon saw to take cardboard vanes, and the centre is drilled. The spinner is fixed to the handle B by means of a long screw. Insert a washer C of $\frac{1}{2}$ in. wood between the spinner and the handle. Paint in bright colours. (M.p)

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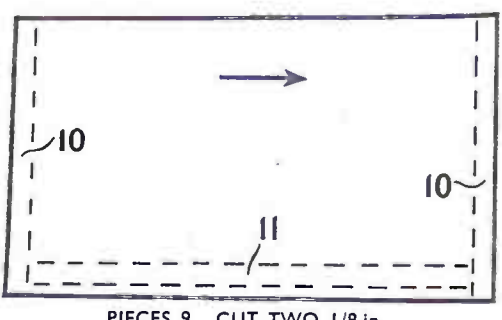
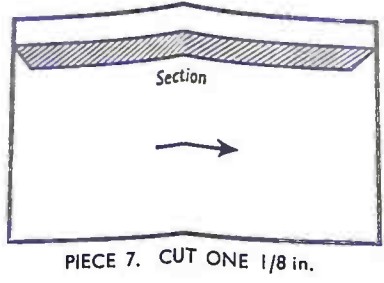
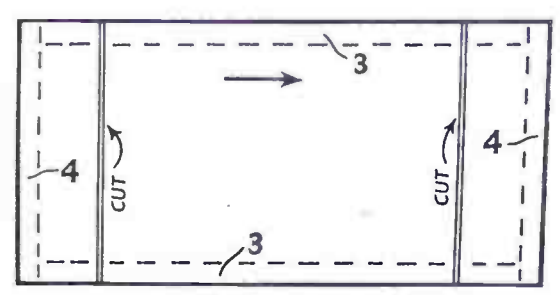
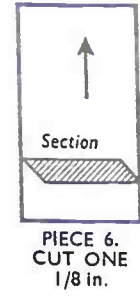
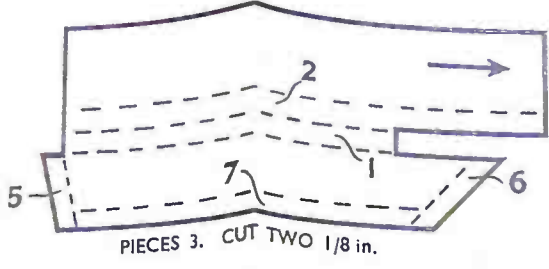
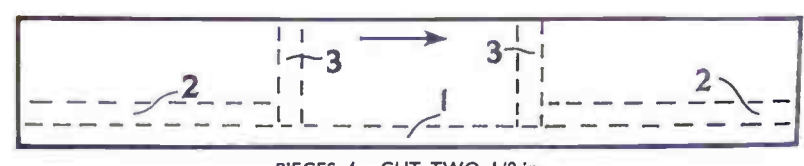
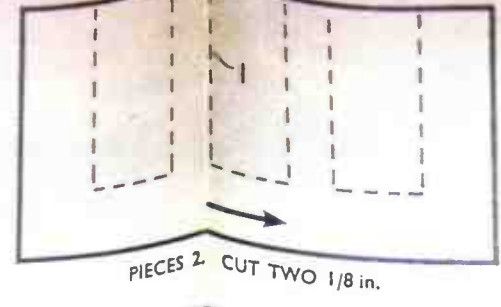
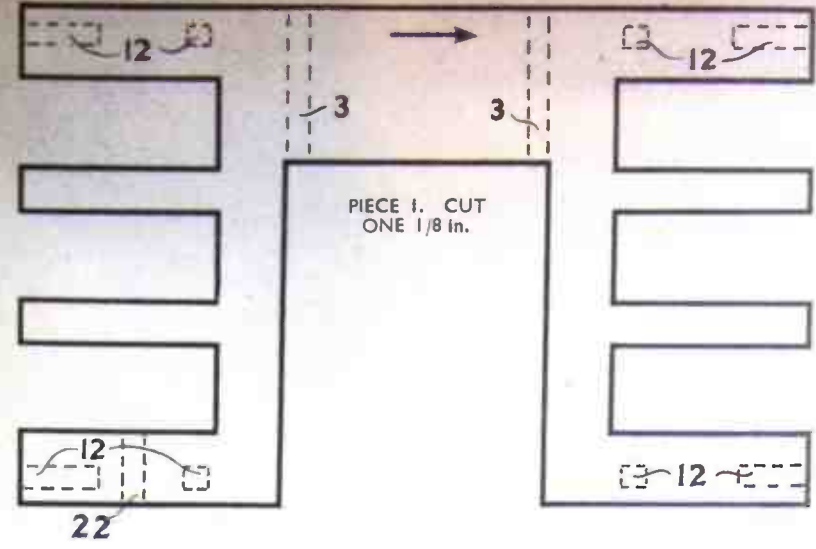
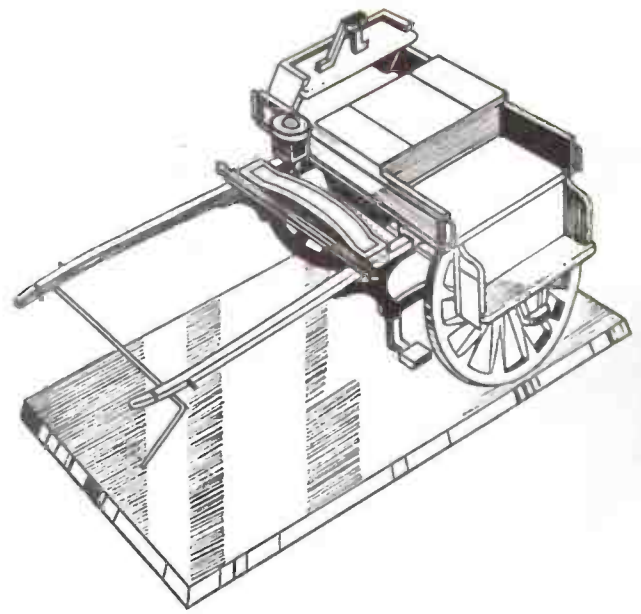
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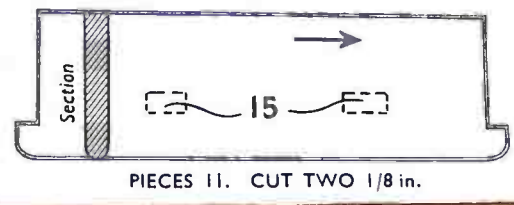
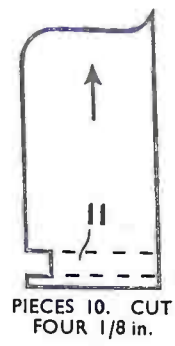
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IRISH JAUNTING-CAR

LENGTH 10 3/4 ins.



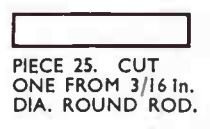
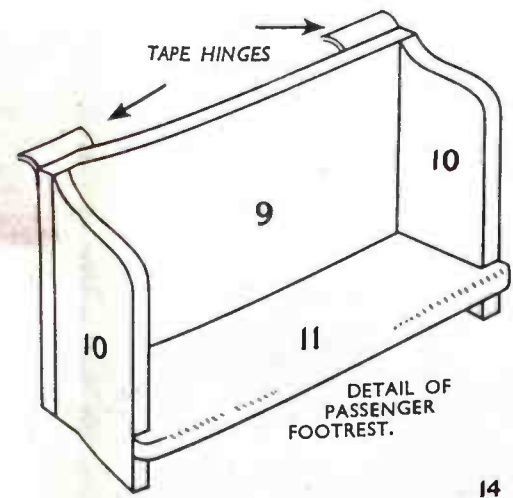
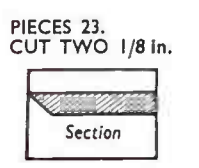
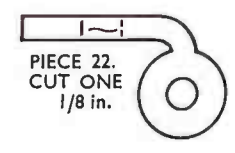
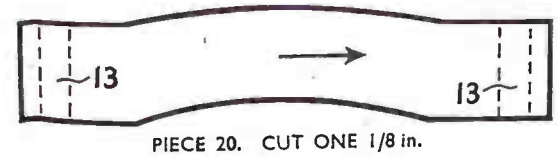
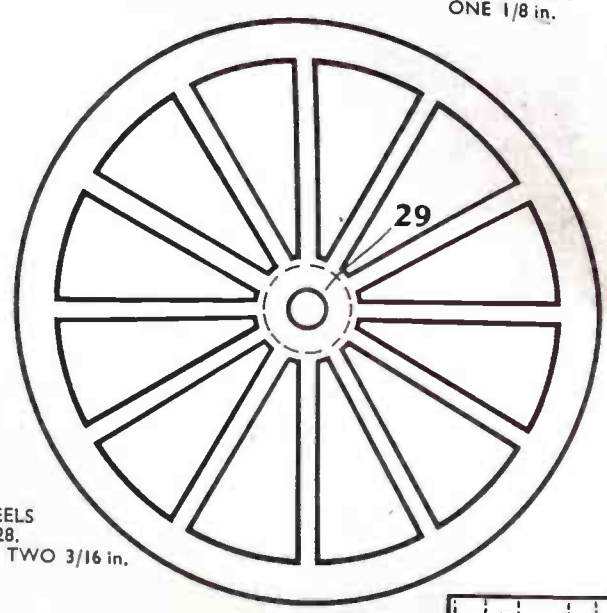
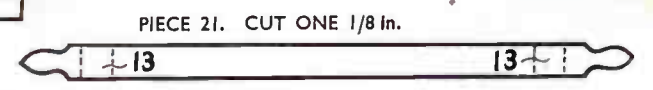
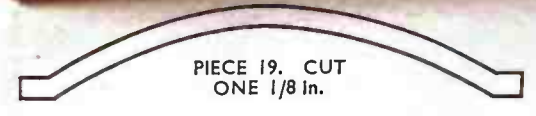
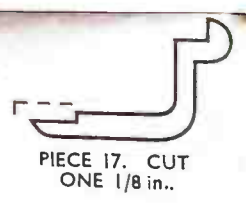
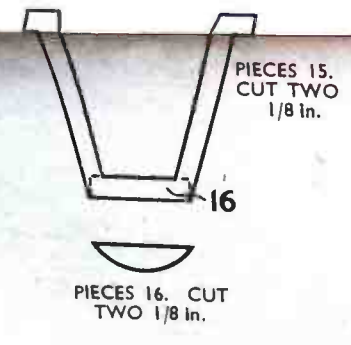
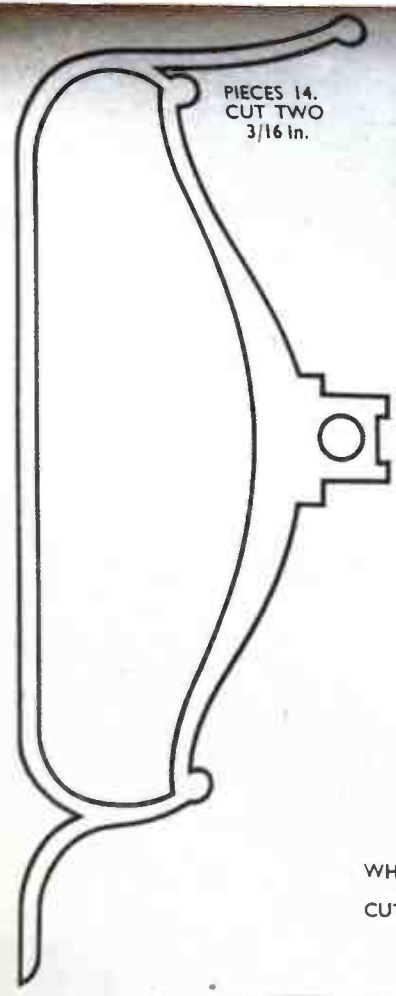
THE ARROWS INDICATE DIRECTION OF GRAIN OF WOOD.



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BASE MEASURES 11 ins. BY 5 ins. BY 1/2 in.

