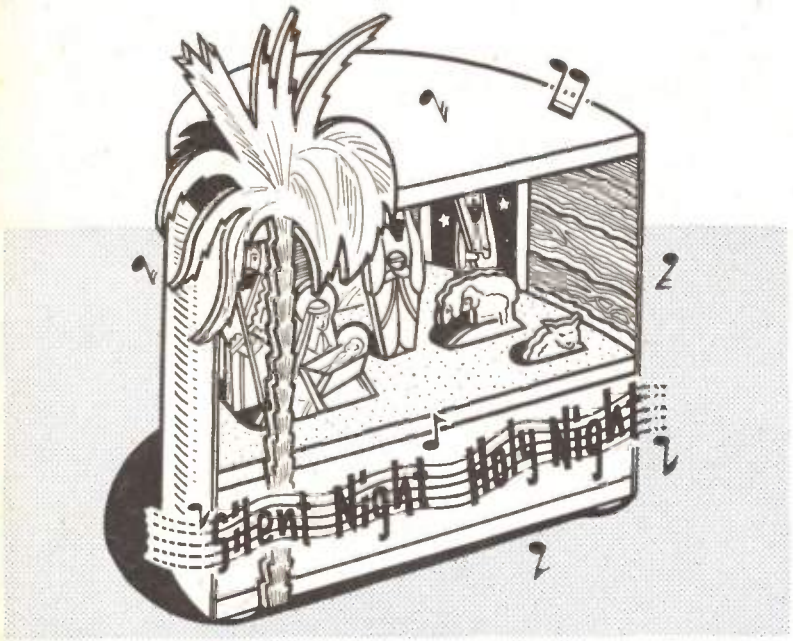
HOBBIES WEEKLY

NOVEMBER 19th 1958 VOL. 127 NUMBER 3290

IN THIS ISSUE

All correspondence should be addressed to the Editor, Hobbies Weekly, Dereham, Norfolk



NATIVITY SCENE

★ FREE design inside

Make this musical model of the Christmas Story

WITH Christmas fast approaching, this delightful model of the Nativity Scene will be welcomed as a gift suggestion. It will make a topical and charming present for any child, or grown-up for that matter, and could well be a set-piece on the sideboard.

The make-up can be confidently undertaken by anyone, construction being quite simple. The model is 6½ins. wide, being 8ins. to the top of the palm tree, and the depth of the circular back extends to 3½ins.

Some appropriate tunes are available for the musical movement, which is concealed in a compartment under the platform containing the figures of Mary and Child, Joseph, the Shepherd, the Three Wise Men, ox, ass, sheep and lamb. These are tenoned into the platform in fixed positions. The music is actuated by a wire lever in the front of the model, and it can be turned on and off at will.

MAKING THE NATIVITY SCENE

All the parts necessary for the model are shown full size on the design sheet, excepting the front panel (piece 4). Mark off the dimensions of this piece on to ¼in. wood and trace and transfer the other shapes on to the thicknesses of wood indicated. Then cut out all parts neatly with a fretsaw and clean up thoroughly with glasspaper. In starting assembly, the movement should first of all be attached to piece 1. Before doing so, release the wire spring from the control arm as shown in Fig. 1. This spring is not required for the purposes of this model and it will therefore be left disconnected.

Now screw down the movement to piece 1 in the position indicated by the dotted lines on the design sheet. The key shaft of course, goes through the hole provided in piece 1 and the key is screwed back again after insertion.

Painting the background

Before continuing to assemble the shell of the model, add the scenic decorations to the thin plywood (piece 5). An indication of the colours to use to represent the inside of the stable with door, etc., is given on the design sheet.

When the paint is dry, glue piece 5 round pieces 1, 2 and 3. (Fig. 1). To hold the shell in shape while the glue is drying, string can be wound round and round.

At this stage, the floor and roof of the stable should be painted an appropriate colour. Next prepare the various figures and animals by painting to individual choice. Christmas cards or colour prints of the Nativity Scene and other Eastern scenes will give indications of the colours to use. Our drawings on the design sheet give the type of dress.

When the figures have been finished satisfactorily, glue them in their respective tenons cut in piece 2.

The front of the 'stage' (piece 4) should next be temporarily positioned between the fronts of pieces 1 and 2. Manipulate the wire plunger of the musical movement and bend it so as to emerge as a switch through the slot in piece 4. Fashion this control arm so that the movement plays when the arm is raised and stops when it is lowered. Successful operation of the switch can be obtained by trial and error.

Piece 4 can now be glued in position, touches of glue being added to the ends where they meet the thin plywood surround.

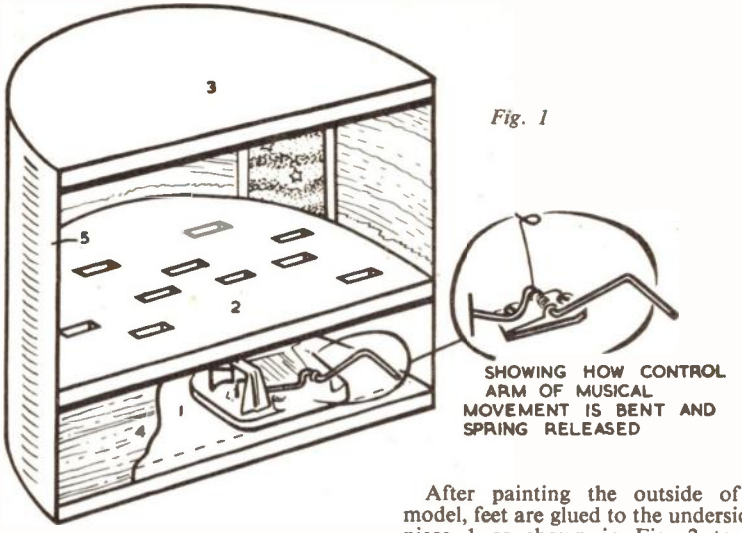


Fig. 1

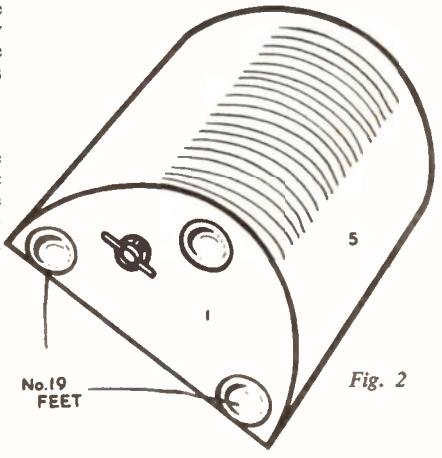


Fig. 2

Paint the palm tree in shades of brown for the trunk, and green for the foliage and fasten it with glue and fretpins to pieces 1, 2 and 3. The position of the tree is not critical, and will best be placed so as not to obstruct the interior view.

After painting the outside of the model, feet are glued to the underside of piece 1 as shown in Fig. 2 to give clearance to the winder key of the musical movement.

Individual workers will use their own ideas on adding further decoration to the scene. For instance, wisps of straw can be glued to the stable floor and front of the stage. Velvet Flock Spray could also be used to advantage in various places, such as in the tree foliage and beards and hair of some of the figures. It will be noted that there is also room in the lower compartment for a small battery if it is intended to incorporate lighting to the scene.

Many readers will want to make up this model in time for Christmas and all the necessary materials are contained in Kit No. 3290, price only 7/6 from branches etc, or from Hobbies Ltd., Dereham, Norfolk (post 1/- extra).

Musical tunes suitable for incorporation are Jingle Bells, Brahms' Lullaby, Gounod's Ave Maria and Silent Night. These movements cost 15/6 (post 6d extra).

Multi-purpose Cramp

THE Elwood Multi-Purpose Cramp should prove an invaluable addition to the tool kit of all handymen. Used for cramping projects such as cabinets and picture frames and articles in metal, plastic and other mediums, this tool facilitates trueing, gluing and pinning, thereby saving time and temper.

It consists of three corner angles and an adjuster cramping screw, the stress being taken up by means of a length of flexible steel cable wire. Precision engineered to ensure accuracy, the Elwood Cramp is obtainable from Hobbies branches, price 23s. 6d., and from Hobbies Ltd, Dereham, Norfolk (postage extra).

Easy to make

DAINTY DRIP MATS

By S. Longbottom

THE accompanying illustration shows a set of dainty drip mats made from scraps of hardboard and covered with the new plastic, self-adhesive covering. Such sets, finally wrapped in neat cellophane parcels, make ideal gifts at small cost.

Little skill or time is required in making these mats, and although the measurements given are for the popular size, there is no reason why this should not be increased to your own requirements for larger table mats.

It will be found best to first prepare a cardboard template and in Fig. 1 it will be seen that the rounded corners are made by making a centre 1in. from each side, completing the arc with compasses. The template is laid on a suitable piece of hardboard, when a pencil may be used for tracing the outline. If several pieces of hardboard are cramped together they can be quickly shaped, using saw and rasp for the rounded corners. All that remains to be done is a final glasspapering on the four edges.

To make a really attractive mat paint the edges in gold or silver, applying while cramped together, and when dry, apply the plastic covering.

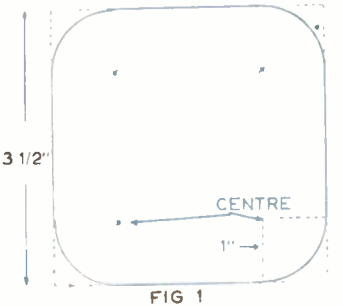
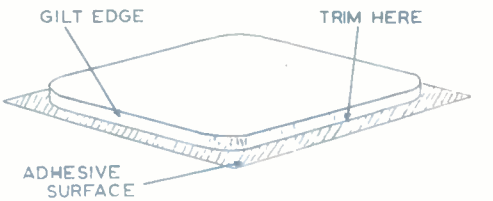


FIG 1

The latter material is obtainable in many attractive self colours or fancy patterns, and is easily fixed by peeling away the protective backing paper, and applying to the mat. A piece of material is cut out just slightly larger than the mat and laid on the table with the adhesive side uppermost after removing the backing. The prepared mat is now laid on the material, so that the smooth side is in contact with the adhesive, turned over and smoothed with a duster.

The surplus material is removed by placing the covered mat face downwards on a spare piece of hardboard, as shown in Fig. 2, when it will be found quite a simple matter to trim by means of a sharp knife or pen-nib trimmer. The latter should be held at an angle to prevent any damage to the painted edge.

FIG 2



If you wish to apply a backing paper to the underside of the mat, you may use white cartridge paper and a good glue, trimming away the surplus as mentioned.

The Story of 'Alice'

THE story of how 'Alice in Wonderland' came about is probably known to many readers, but will bear re-telling.

Lewis Carrollwas an Oxford Don and professor of mathematics and it seems strange to associate him with the writing of so delightful and charming a book for children. He was fond of young children, and was a friend of the Dean of Oxford's three little girls. In leisure times he was wont to join these girls in a country ramble, or in outings 'on the river during summer. Most afternoons in fine weather they spent some time in a boat, and to while away the hours he acquired the habit of telling them fanciful stories of his own invention, made up, no doubt, at the time.

From one of the girls he borrowed the name of his heroine. The original 'Alice' has told the story of the famous book, and how it came into being. She says that most of the stories were told to the girls on river expeditions.

The story of 'Alice' was begun one summer afternoon when the sun was so hot that the little party landed down in the meadows by the river, deserting the boat to take refuge in the only bit of shade to be found, under a newly-made hayrick. Here, from the three eager children, came the oft-repeated petition, "Tell us a story', and in response the author invented his famous characters and their adventures in Wonderland. Sometimes to tease them, he would stop suddenly and say 'That's all till next time'. 'Ah! but it *is* next time'! would be the exclamation of all three girls, and after some persuasion the story would start afresh. Perhaps, at times, the author would pretend to fall asleep, to their great dismay.

Thus began, in romantic manner, a world famous story that, save for the pressing clamours of three little girls, might never have been told. (A.S.)

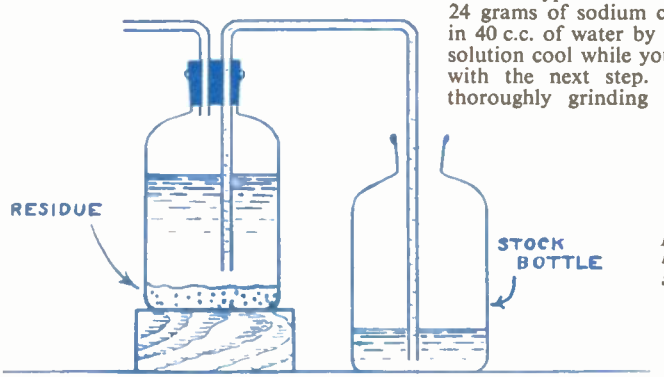
CHEMISTRY IN THE HOME

MAKING YOUR OWN CHEMICALS
Part 3

IN this, the third and final article of the series dealing with the home manufacture of chemicals, we commence with the preparation of a solution for your reagent shelves.

Potassium hydroxide solution

Potassium hydroxide solution is soon prepared from potassium carbonate and calcium hydroxide (slaked lime). Dissolve 16 grams of potassium carbonate in 160 c.c. of water. Boil the solution and add gradually 12 grams of calcium hydroxide, stirring constantly. While still stirring, continue the boiling for ten minutes. Let the solution cool, pour it into a bottle, close the bottle, and let it stand until the insoluble residue has completely subsided, leaving a clear solution above.



Siphoning off potassium hydroxide solution

The residue is mainly calcium carbonate, and the clear liquid above, consisting of potassium hydroxide solution, must be carefully decanted into your stock bottle, taking care not to disturb the sediment. Filtration through filter paper is not advisable with alkali solutions such as this. A plug of glass wool in a funnel may be used, if you have a supply of glass wool.

The best method, if you do not mind going to a little extra trouble, is to fit up a siphon as shown in the diagram. Note that the stock reagent bottle should stand lower than the siphon outlet, otherwise the siphon will not work. Adjust the siphon tube by sliding it in the cork until it reaches to within about 1 centimetre of the residue.

By blowing down the short elbow tube the siphon is started, and the clear potassium hydroxide solution passes over into the stock bottle. Use a rubber closure for the stock bottle, that is, a rubber stopper or a rubber disced screw top. Cork rots and glass stoppers stick fast.

Sodium hydroxide solution

Sodium hydroxide solution can be made by following the same process as for potassium hydroxide, but use instead 28 grams of sodium carbonate (washing soda).

Sodium hypochlorite solution

To prepare your own supply of sodium hypochlorite solution, dissolve 24 grams of sodium carbonate crystals in 40 c.c. of water by warming. Let the solution cool while you are carrying on with the next step. This consists of thoroughly grinding in a mortar 16 grams of bleaching powder ('chloride of lime') with 120 c.c. of cold water. Let the mixture stand a quarter of an hour and grind again. Filter the solution and add to it a little at a time the sodium carbonate solution. A white precipitate of calcium carbonate appears. Stop the addition when no more precipitate forms. Filter the liquid. The filtrate is sodium hypochlorite solution.

Since it bleaches cork, use a glass or rubber stoppered bottle for storage.

Silver nitrate

Silver nitrate is an expensive item, but if you have some foreign silver coins or scrap silver jewellery, the only expenditure involved will be for the cheap nitric acid and a small piece of sheet zinc. The process has been given in a former article, but some readers may not have seen this and its importance merits repetition.

Silver used for coins and jewellery is alloyed with other metals, notably copper, to harden it. The first steps of the process separate the silver. Put the metal in a beaker and cover it with nitric acid diluted with an equal volume of water. Stand the beaker in the open air, since the fumes are injurious. The metal gradually dissolves. If it does not all do so, add small amounts of nitric acid until it does, ignoring any powdery black matter which appears.

Filter the solution and add a solution of sodium chloride (cooking salt). Do not use table salt, for these days much of it contains additives to make it run freely. A white precipitate of silver chloride appears. Continue the addition of salt solution until no more precipitate appears. Filter off the silver chloride and wash it thoroughly. Transfer it to a beaker and stir it into a cream with dilute sulphuric acid and drop on a small sheet of zinc. The chloride blackens, owing to production of metallic silver. When it is uniformly black, remove the zinc, rinse off into the beaker any adhering silver by directing on to it a jet of water from your wash bottle, and then leave the silver and acid to stand fifteen minutes or so.

Filter off the silver, wash it thoroughly with water, transfer it to a beaker and dissolve it in just enough nitric acid diluted with an equal volume of water, ignoring any black powder drifting about in the solution. This also should be done in the open air, owing to the fumes. Filter the solution and evaporate it to dryness. The white residue is silver nitrate. Always dissolve it in distilled water or in filtered rain water. Tap water usually contains chlorides which will produce a cloudy solution and contaminate it with other metals, even after filtration.

Starch papers

Starch papers, though fairly cheap, cost far more than they are worth. Filter paper and a potato are the almost costless requisites. Domestic starch can be used, but as it often contains blueing material, it is better to make pure starch of one's own, which will in any case be needed at some time in the laboratory. Wash the potato, peel it, grate it and shake it with water. Starch separates copiously from the pulp. Strain off the

● Continued on page 117

Before winter comes — 2

CURING CHIMNEY TROUBLES

WHEN we drift into the winter we find a collection of disasters at every turn and, yet most of them can be avoided by the barest elementary precautions. It is because the home, from the repair angle, has been rather neglected during the summer months. A little preparation for events ahead should be made towards the end of September — and you will find many problems awaiting you.

By V. Sutton

You may perhaps sweep your own chimney, if not you may have to wait for a sweep — 10 to 12 weeks often. Why not have all chimneys swept before the winter? A chimney in any room is a source of air and a clean chimney can mean clean air. Many sweeps use the vacuum cleaning system and this does tell you if the chimney is in good repair inside. If mortar comes down, then perhaps birds have been building in the top.

We often open up another room in the autumn and on trying to light the fire find ourselves in a room of smoke and, perhaps, soot. This is how it can be tackled:

In the first place it may be a cold and damp flue, in the second it may be that birds have been trying a nest and thirdly, (rather important) it may be a change of air currents outside.

Regarding the latter, I have had considerable experience of this trouble. It may be due to new and taller buildings being built nearby, or it may mean that trees in your garden or those of a neighbour have shot up over the years and have caused quite different wind currents from those when your property was built.

Warm chimney

To remedy the first trouble, push up a wad of newspapers into the chimney and light them before starting the fire. This should clear and warm the chimney interior. If you feel there is a stoppage call in a builder and seek advice. Fallen mortar on ledges may cause a stoppage.

Some builders I know, especially the smaller one-man firms, have their own gear for chimney troubles. They have rods and a special light on a cable which they lower inside the chimney.

The question of down draught is a real problem but you will find that any ironmonger or timber yard will have leaflets on the 'Colt cowl' which I have reason to think cures all troubles without another ten feet built on your chimney.

Most 'do-it-yourself' magazines deal each year at the specified time with lagging pipes and so on, so I am only going to deal with some aspects which might get over-looked. We may have our pipes lagged, we may think we are quite safe till something stops to flow — then we know. That has happened to me more than once.

If you can get into your loft and crawl around, then try to locate the various pipes. I have a rough drawing of mine and it can be useful, apart from interesting. It was not till we had a bitter east wind that we seriously froze up. As I was sure that all pipes were soundly lagged I was quite puzzled. The real and only danger was found where the cistern water pipe came near to an outside wall and under the eaves. It was at that point it froze and caused a very difficult stoppage. There may be points in the set-up of the pipes which so far have given little trouble but we have to guard against sudden emergencies.

I have always been told that if you can keep the loft heat level at just the right point you will certainly not freeze out in the main water system. I make use of two small sized hurricane lamps. This item is always handy for work in the loft and purchase of two meant that I had light and limited heat in the loft all the time. Some of the equipment stores stock this small size and they are very handy. They are better than a torch for getting about the loft and safe as the flame is covered.

Once again, the home handyman may have to come to the rescue in the matter of doors and windows which will not open properly. This may not have been noticed in the summer months but can now mean a very difficult tug when anyone goes in or out. As a rule it is to be found that the door catches on the door-jamb due to heavy coatings of paint. Stand one side of the door and shut it leaving someone with a lit torch on the other side. You will find that the lack of light in places along the door edges will show exactly what needs to come off.

Along the top of the door is also another source of trouble and here you may need a course file or, better still, one of the latest file shaped planes, to level off the bumps.

● **Continued from page 116**

Chemistry in the Home

pulp through a sieve and let the starch and remaining finely divided pulp settle. The starch packs down firmly and the pulp can be rinsed off. Add more water, shake up again and allow to settle before pouring off the water and still remaining pulp. Repeat this operation until the starch is quite white. Then turn it out on to a shallow dish to dry at room temperature.

Cream 1 gram of starch with cold water and pour it into 150 c.c. of boiling water. Continue boiling until the liquid thickens. Dip filter papers in this starch paste and hang them to dry.

By recovering the zinc from old batteries you can very cheaply make all the zinc chemicals needed. Strip off the zinc, melt it and pour it from a height of about 6ft. into a bucket of cold water. The zinc will then be in the granulated form which is so much used in the laboratory.

To make the equally important zinc sulphate, dilute 5·4 c.c. of strong sulphuric acid by stirring it a little at a time into 50 c.c. of cold water contained in a beaker and cooled by standing it in a pan of cold water. To the diluted acid add 7 grams or a little more of granulated zinc. Hydrogen will be given off, so keep naked lights away from the beaker. When gas evolution stops (this requires several days, but it can be speeded by standing the beaker in a pan of hot water now and again), filter the solution and evaporate it by boiling until a frothing syrup is obtained. Let it cool overnight, when the zinc sulphate will have crystallised out as a moist white mass. Transfer this to a porous tile or brick, press it well to remove mother liquor and let it dry.

To prepare basic zinc carbonate, dissolve 71 grams of zinc sulphate in 350 c.c. of boiling water and 72 grams of sodium carbonate in 350 c.c. of boiling water. Mix the solutions. White basic zinc carbonate is precipitated. Continue boiling for about ten minutes, stirring constantly. Filter hot and wash with water until one wash water no longer gives a white precipitate with strontium nitrate solution. Dry the basic zinc carbonate in a warm place.

Lastly, you will certainly need a supply of zinc oxide. To make it, simply heat 40 grams of basic zinc carbonate to redness for half an hour or so, and then let it cool.

OPTICAL TOYS TO MAKE

CHILDREN'S toys during the Victorian era in England were frequently designed to be of obvious educational value. Many of the devices bore complicated sounding names, like the Thaumatrope, which means 'wonder turner', invented by a certain Dr. Paris.

The Thaumatrope is essentially a disc to which two strings are attached at points opposite to one another, so that by twisting the strings and pulling the ends gently, the disc can be made to spin around. If in the centre of one side of the disc, a coloured canary is drawn, and on the other side is drawn a black bird cage, when the disc is rotated, the eye of an observer will appear to see both pictures at once, so that the canary will seem to be inside the cage. This optical illusion occurs owing to the fact that when an image of any object falls upon the retina or 'screen' at the back of the eye, an impression of the image will linger there for about 1/12th of a second. As the disc will be turning very rapidly, the images of both canary and bird actually overlap and blend together on the retina of the observer, and he thinks he sees only one combined picture.

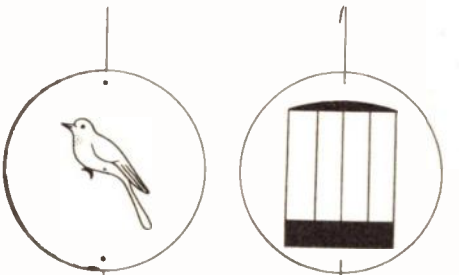
It is quite easy to cut Thaumatrope discs from stout cardboard, and very neat holes for the strings can be made with a cork borer if one is available. For each disc two lengths of light flexible string are cut and threaded through the holes. The ends of the strings are secured by means of large knots tied in them.

A wide variety of interesting subjects can be adapted for the discs, such as a horse jumping over a gate, a man wearing a comical hat, and a camel bearing an arab rider, but the traditional bird in a cage will always prove very popular. A hundred years ago when the Turks were feared for their ferocity, a headless Turk was often drawn on one side of the disc and his grinning head on the reverse side. When the Thaumatrope was twirled and spun, the Turk regained his head.

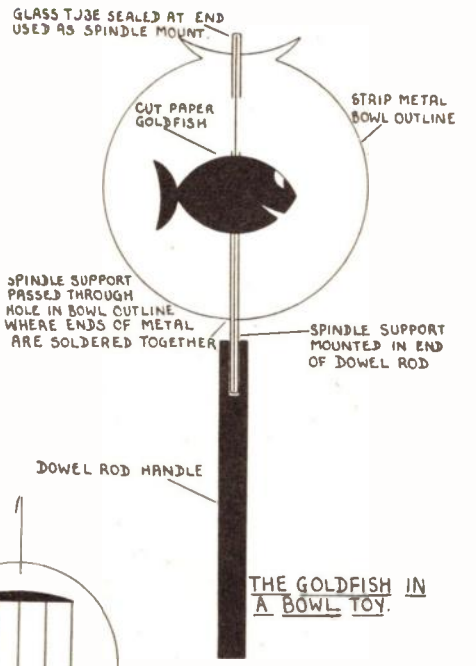
An alternative method of supporting the disc is to insert it in one end of a short length of a dowel rod. The disc is rotated by rolling the dowel handle back and forth between the hands. If a flower is drawn on one side and a large bee with outspread wings on the opposite side, and the handle rotated, the bee will appear to beat its wings as it hovers over the flower.

A rather more elaborate version of the Thaumatrope was the 'Goldfish in a Bowl', which was often made and sold by street toy sellers. The toy consisted of a silver metal outline of a goldfish bowl and a painted goldfish, mounted upon a handle. When the metal outline was spun around, a miraculous glass-like bowl seemed to surround and contain the stationary goldfish. Light reflecting on the spinning metal emphasised the illusion of real glass. Such a toy can be quickly assembled from materials easily acquired.

It is best to make the handle of the toy first from a 7ins. length of ¼in. diameter dowel rod. In one end of the rod drill a hole 1in. deep and ¼in. in diameter. Be careful to make the hole vertically in line with the sides of the rod. Next obtain a 4½ins. length of ¼in. diameter glass tubing and seal one end by heating in a very hot flame until the glass is red hot. This tube will form the spindle support. For the spindle, a steel knitting needle can be used. Next a ⅛in. wide strip of tin is bent into the outline of a goldfish bowl 5½ins. high. The ends of the outline shape, which should be at the base of the 'bowl' are best soldered together, but can be fairly neatly joined with sellotape. A hole slightly greater than ¼in. in diameter is bored in the base of the bowl outline in a position midway across. A similar hole, slightly less than a ¼in. in diameter is bored mid-way across the top of the bowl outline. A second piece of ¼in. diameter glass tubing 1½ins. long, is heat sealed at one end in the same manner as the spindle support. The goldfish can conveniently be cut double from two pieces of gummed paper. Now all the parts are ready to be assembled.



THE THAUMATROPE
SHOWING BOTH SIDES OF THE DISC



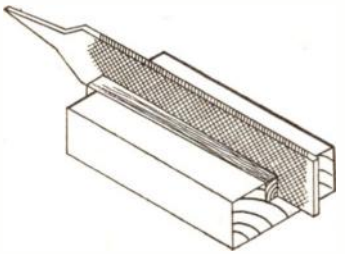
THE GOLDFISH IN A BOWL TOY.

To put the toy together first take the handle and insert the spindle support. Next push the short length of glass tubing, with its sealed end upwards, firmly through the hole in the top of the bowl outline. Place the spindle in the spindle support. Now place the bowl outline over the spindle support in such a manner that the short stub of tubing is caught upon the top of the spindle. To complete the toy, mount the gummed paper goldfish about the top of the spindle support. The handle can be attractively decorated with plain coloured gummed paper, and expressive eyes and amusing smiling mouth can be added to the goldfish, as desired. To work the toy, spin the glass stub at the top of the bowl outline. To add to the realism, the fish may be made to move from side to side by a slight twisting movement of the handle. The toy will work even better if a few drops of lubricating oil are placed in the spindle mounts. (A.W.)

WORKSHOP TIPS

SAW SHARPENING DEVICE

BEFORE sharpening a saw it is first necessary to level off the teeth by running a flat file across the points. By doing this you can be certain that every tooth will do useful work. It is essential, however, to file the teeth perfectly square but many people find it a little difficult to keep the file truly at right angles to the saw when doing this



job. This difficulty can be easily overcome by wedging the flat file in a block of wood as shown. It is then a simple matter to run the file over the teeth and if the block is kept tightly against the saw you can then be assured that the teeth will be filed square and straight. (F.K.)

NEEDLE DRILLS

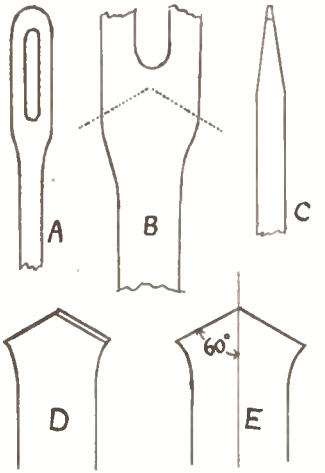
BROKEN needles, being of no further use for sewing are often put to work in other spheres. The very good quality steel which they are made of makes them ideal for converting into a variety of useful little tools.

A drill happens to be one of those tools which is always wanted by craftsmen of all kinds and it is often difficult to get a very small one for some special job. It is here then that the versatile needle can help us.

It is available in dozens of sizes and when properly shaped and ground will produce a really high grade drill. Choose a needle that has a 'swollen' eye — some are made quite parallel and these are of no use for drills. The cutting angle can be varied according to the type of material it is intended to cut.

With a pair of pliers break off the eye as shown at (B) and then grind it down to the dotted lines. The best cutting angle for general work is about 60° (see E) but this can be made more pointed for soft metals. Next the front and back will require grinding to a taper, leaving the top quite thin but not with a sharp edge (C). This must now be ground so as to produce a cutting edge when rotated in a clockwise direction as shown at (D).

Do not overdo this cutting edge and make it too sharp an angle which would soon become blunt. About 5° is sufficient for drilling steel and other hard metals, but can be increased up to 10° for the softer types such as brass and copper.



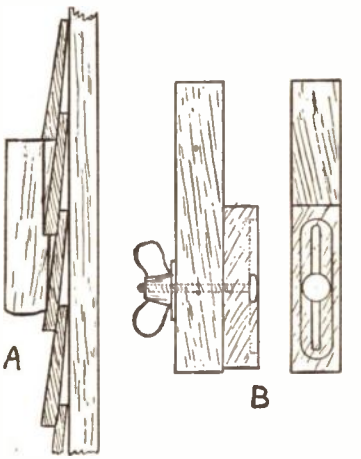
Most needles are made flint hard and it is advisable to very slightly draw the temper to about a very pale straw colour. The shank can however be made softer to avoid breakages in use, and this may be brought down to a blue colour but be careful to leave the cutting edges hard and not draw the temper of them also, otherwise their efficiency will be decreased considerably. (A.F.T.)

IT very often happens that the simplest tools prove to be the most efficient. Many gadgets taking only a few minutes to make may do the job easier than something quite elaborate and perhaps costing pounds.

Here we have a simple little gauge for obtaining the correct spacing when fixing weatherboards to a shed. Just nailing them on without any measuring is a very slipshod method and might spoil an otherwise good job by their uneven appearance.

Two versions of the gauge are given, that at (A) consisting simply of a short piece of wood notched as shown. If however you do much of this type of work then the adjustable model at (B) will well repay the time taken to make it.

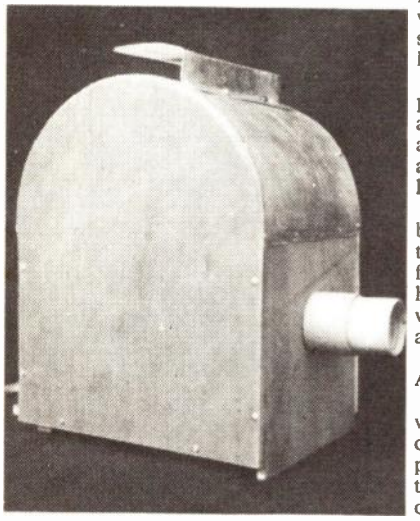
WEATHERBOARD FIXING GAUGE



Beech or similar hardwood is quite suitable and in either type need not be more than about 1in. thick. In (B) the head of the bolt should be sunk flush with the top of the sliding bar and this should move easily along its entire length. A small wingnut over a washer on the other end of the bolt completes this simple little tool.

It is quite possible that the handyman will find many other uses for it in his various projects. (A.F.T.)

AN EPISCOPE PROJECTOR



By F. G. Rayer

AN episcope projects an enlarged image of opaque objects such as picture postcards, drawings, illustrations from books, and so on. The image thrown upon the screen is in full colour, and fairly flat objects, such as some kinds of leaves and flowers, can also be projected. By making use of a mains-voltage bulb, a picture of good size and brilliance may be achieved, and the episcope described here can give very pleasing results.

Wood ¼in. thick is used throughout, with a metal top to help dissipate heat. A ventilated light trap is also fitted. If wood of a different thickness is to hand, this can be used without many changes in dimensions.

Cutting the parts

Fig. 1 shows front, bottom, back, and the hinged flap, all cut from ¼in. wood. A strip about 6ins. long and ¼in. square is also necessary, to glue or pin on the bottom of the projector at the back.

The inside of the back, and edges of the 3in. by 5in. opening, should be painted flat black. The other pieces are unpainted inside. The exact diameter of the lens hole may need adjusting, to suit the lens, as explained later.

Two sides also have to be cut from ¼in. wood. To do this, measure off a width of 5½ins. and draw a centre pencil line 2¾ins. from each side. At a point 4½ins. along this line, mark the dot 'X' in Fig. 2. Using a pair of compasses, draw a circle 1⅜ins. in diameter, as in Fig. 2, for the bulb holder. Then describe the large semi-circle with a radius of 2¾ins. This is the shape to which the wood is cut, as in Fig. 2. Both sides are alike, but the bulb holder hole is required in one only.

Cut a sheet of thin aluminium or tinplate 7ins. by 10ins. to curve over the top and drill several ¼in. diameter holes above the bulb position. The light trap, also of thin metal, bolts on above these holes, as indicated.

Another piece of flat metal forms a baffle, to prevent light falling directly on the lens. Allowing about ¼in. each end, for fixing, this is 2ins. by 7ins. Household containers, opened along the seams, will provide suitable metal sheet for top and baffle.

Assembly

Small panel pins and glue will hold the wooden parts together. The front overlaps the bottom by ¼in., lifting the projector so that air can flow up through the holes. The bottom, in turn, overlaps the back by ¼in. so that the flap can be hinged as shown. When these parts have been nailed together, one side is carefully positioned, and fixed on.

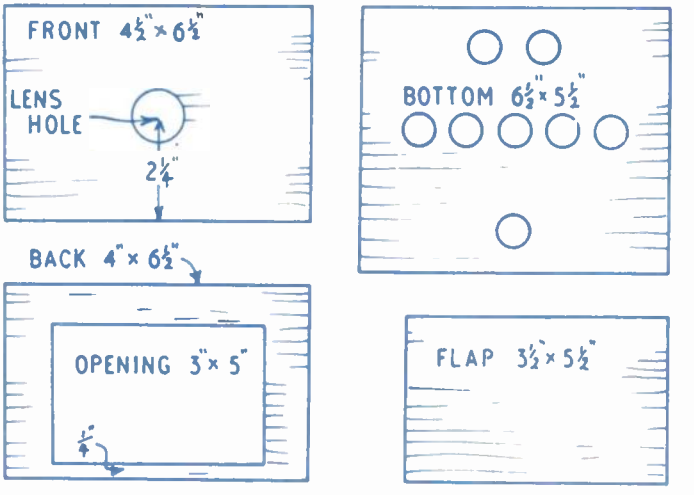


Fig. 1—Dimensions of parts

The baffle is then fitted, 2⅛ins. from the bottom of the projector, inside, and 1½ins. from the front. Two small sprigs or short screws will hold it. The second side is then attached, and the baffle secured by putting in a small screw.

The bulb holder can now be fixed in place by screwing up the ring intended to hold a shade in position, as in Fig. 3. The cover of the holder should be removed, and threaded upon a length of good quality twin flex, as supplied for table lamps, etc. The ends of the flex are bared, and held by the small terminal screws in the holder. An adaptor is similarly connected to the other end of the flex. The bared ends should be tightly twisted, and then doubled, to allow the screws to grip well. If desired, a switch of the enclosed type can be added in the flex, near the projector.

The metal top, with trap already attached, is now curved carefully over the top of the body, and held with small screws or panel pins. Begin nailing at the top, directly above the bulb, and work towards the ends of the sheet in both directions, to avoid any buckling or gaps between metal and sides. A few small screws will be needed along front and back edges, to hold the sheet down firmly. One back screw pivots a small catch, used to hold the flap shut.

Lens and tubes

The quality of the projected picture depends upon the lens. Simple magnifying lenses give good results near the centre of the picture, but definition falls off towards the edges. This may not be noticed when projecting views, pictures, and similar material, but it will be a little troublesome if printed matter is projected, because the print will not be sharp near the screen edges.

Achromatic lenses are better, and consist of two lenses cemented together. Better still are doublet lenses and similar lenses designed for projectors.

The focal length of the lens is fairly important, and should be around 6ins. If the focal length is shorter, the lens will have to be set back into the projector, to get it nearer to the illustration being projected. Similarly, lenses of longer focal length will have to be fitted in a slightly longer tube, to get them far enough from the picture to be projected.

Lenses smaller in diameter than about ¾in. are not much recommended, because they pass a small amount of light, so that the image thrown on the screen is less brilliant.

These points may make the selection of a suitable lens seem difficult, but this is not so. For many general purposes, a cheap single lens, such as can be bought at very low cost from suppliers of ex-service optical equipment, will be satisfactory.

The lens is fitted in a short cardboard tube, or a tube made by rolling glued brown paper round a suitable object. Semi-circles of thin card, fixed with a spot of glue, will keep the lens in place. This tube is a sliding fit in a larger tube, which fits into the hole in the projector front, and is held there by glue.

Bulb to use

Any household bulb will be satisfactory. For a small screen, a 40 watt or 60 watt pearl bulb will suffice, especially in a well-darkened room. For a brighter picture, a 100 watt bulb can be inserted instead, or one of the powerful high-intensity photo enlarging lamps.

The bulb can be inserted through the opening in the back of the projector. With powerful bulbs, the top of the projector will grow quite hot, after a period of running.

Using the episcope

The picture or other matter to be projected is placed between flap and projector back, the flap then being closed. Picture postcards of bright glossy type will give the best results, but any black and white or coloured illustration, etc., can be used with success.

The image may be thrown upon any white surface, some 3ft. or so from the projector. A large sheet of glossy drawing paper will make a good screen. White fabric is poor, giving a dull picture. A wall of the room may sometimes be suitable, but dull, matt wall finishes will greatly reduce the brilliance of the image.

The lens is moved in or out, to bring the picture into sharp focus. Or the projector may be moved towards the screen, or away from it, to do this. To obtain a larger picture, move the episcope farther from the screen, restoring sharp focus by pushing the lens slightly inwards. With a small lens and bulb, very large projected pictures will not be very bright, so it is best to keep the episcope reasonably near the screen.

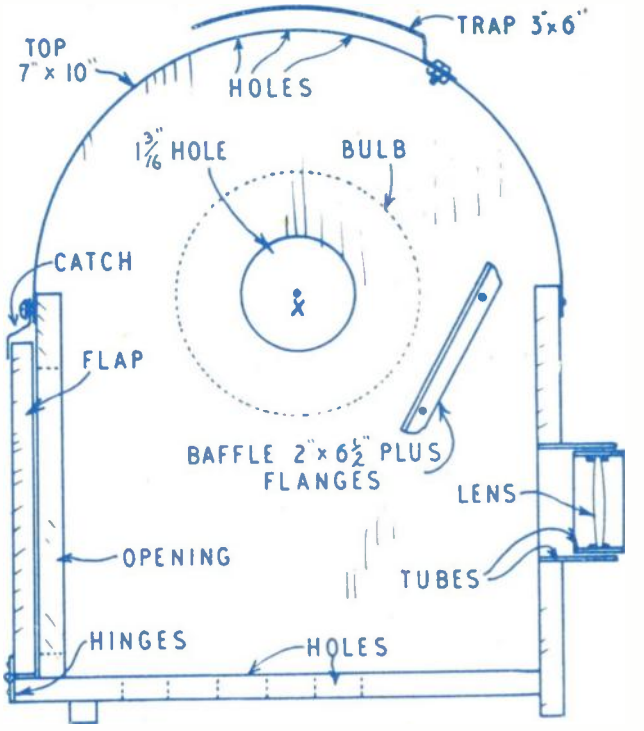


Fig. 2—Assembly details

For children, many comic papers will provide suitable picture strips, which can be cut out and passed across the opening in the back of the projector. Printed matter can be cut off, and read aloud.

All episcopes of this kind project a reversed image on the screen. This is seldom important with illustrations, but means that print cannot be read. When necessary, this can be overcome by turning the projector at ninety degrees, so that one side of it faces the screen. A small mirror is now set at forty-five degrees, near the lens, to reflect the image upon the screen, when printed matter will appear correctly, and can be read.

Sharper definition

The sharpness or definition of the image thrown by cheap magnifying lenses can be increased by fitting a disc of card, with a central hole, against the lens. The smaller the hole, the greater will be the improvement in definition, especially near the edges of the picture.

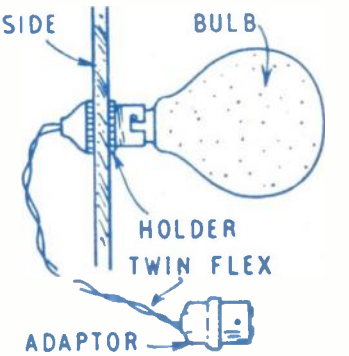


Fig. 3—Dimensions of parts

However, very small holes will reduce the brightness of the image rather severely.

If it is possible to focus the picture sharply at one side, but not the other, this indicates that the projector, lens, and screen are not all correctly square. The projector or screen can be twisted slightly one way or the other, to correct this, and a check should be made that the lens is not crooked in the tube.

MAKING YOUR OWN FLOATS

By 'Kingfisher'

THE youngster who has just taken up fishing is often up against getting good tackle owing to the cost of gear these days. There are quite a number of items, however, which can quite easily be made at home with one or two simple tools and at practically no cost at all.

Take floats, for example. It is possible to make every type of float, or rather floats which can be used for every style of fishing, from a material which, much lighter than balsa wood, can be collected in the countryside and costs nothing at all. I refer to the pith from the alder or elder tree.

Use elder pith

The pith required is that from the dead shoots and if you look around you will find these, particularly in the alder bushes, growing straight up from the ground. Many of these die off each year, the thin bark or skin goes black, the pith inside dries up and there is your material. The outer cover will break away quite easily and you will be left with a length of the pith so light that if you drop it, it almost floats to the ground.

You will also notice that it tapers off as it reaches the end so that you have a length of material with a gradual taper and which, therefore, will give you floats of various diameters. The pith is cut into lengths to suit your own taste and, of course, many ideas will come to you as you progress in the job of float-making.

Boring the hole

Let us take a typical float which, when finished, will look like the illustration (Fig. 1). Cut a length of pith about ¼in. in diameter and through this bore a hole with a knitting needle. Take care that the hole goes straight through the centre and the best way is to bore half-way along from one end then repeat the process from the other. You will have to buy a length of ⅛in. wood dowelling so that it is a tight fit in the bore. The length of the pith is about 3ins. and the length of dowel required will be 6ins.

The dowel is pushed through the pith until one end is flush with the latter. The pith is then tapered off with a sharp razor blade. Push the dowel through and repeat the process at the other end. This shaping off is only done roughly and to save a lot of glasspapering (Fig. 2).

Next you must glasspaper each end of the pith so that you get a nice streamlined shape as at Fig. 3.

Put a loop on to the dowel at one end and for this you can use either copper wire or stout nylon. This is bent to the shape of a 'U' and is bound to the dowel with a leg of the 'U' on each side of the dowel. When bound, run the whipping in a few wide turns for about 2ins. along the stem (Fig. 4) and fasten down with waterproof cement. Push the pith over this whipping where it will be held firm when the cement sets and you will have your effort looking like the illustration in Fig. 5.

Waterproofing

The next operation consists of waterproofing your float and this can be done by soaking it in a solution of shellac which can be bought from handicraft stores. Pith is not waterproof and although the finished job will have a coat of enamel, if this is chipped the float would become waterlogged.

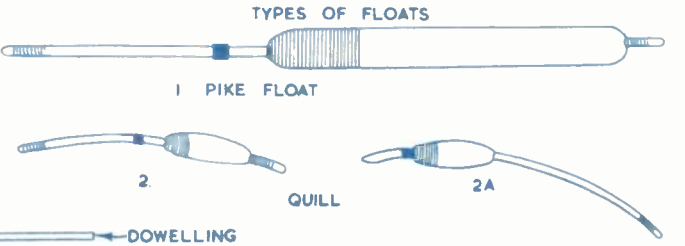
Allow the shellac twenty-four hours to dry, when you will find that the pith is slightly roughened and it should be rubbed down again with fine glasspaper.

Finish with enamel

You are now ready for the final job of enamelling. Give a thin coat of white all over the pith, including the stem. When this has dried you can start with your colour in the pattern as shown in the illustrations. You may fancy your own patterns and colours but I find it best to keep to a set pattern, with the tip of the stem in the same colour as the top section of the float.

These floats are very buoyant and will

● Continued on page 124



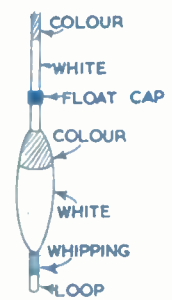


FIG. 1.

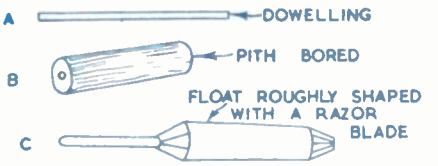


FIG. 2.

FIG. 3.

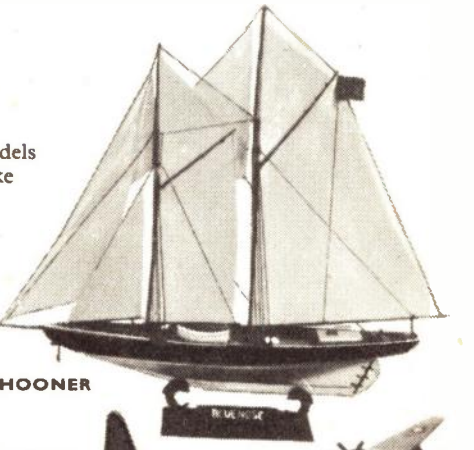
FIG. 4.

FIG. 5.

ONLY 'AURORA' GIVES YOU THIS DETAILED REALISM!

World's most varied range of construction Kits

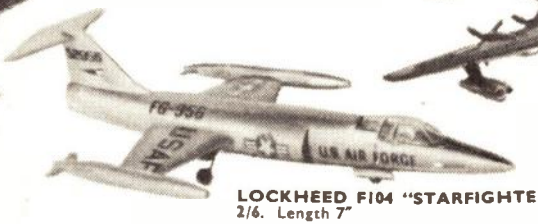
NOW YOUR WHOLE FAMILY can enjoy the pleasure of making exactly the models they like! Aurora plastic construction kits are precision-engineered to make construction quick and easy. All Aurora models are made with exact accuracy, realistic to the last detail; they provide a perfect hobby for everyone in the family. Boys thrill to the detail-perfect warplanes, tanks, ships and historically fascinating Knights-in-Armour. Girls love the gay national figures, accurate to the last detail in dress and design. Give and enjoy Aurora realism for Christmas — and keep in touch with your stockist for news of the latest Aurora releases!



BLUE NOSE SCHOONER
25/-. Length 15¼"

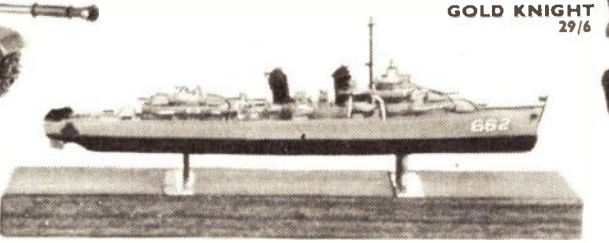
PBY CATALINA
19/11. Length 10¼"

B36 CONVAIR BOMBER
4/11. Length 6¼"



LOCKHEED F104 "STARFIGHTER"
2/6. Length 7"

GOLD KNIGHT
29/6



"GENERAL PATTON" TANK 9/11
Length 5¼"

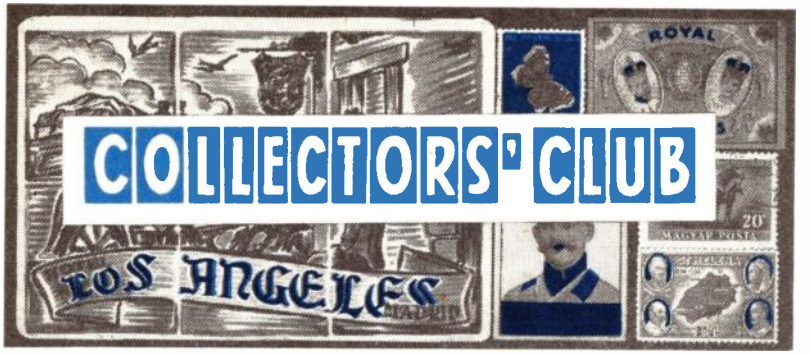
CHINESE MANDARIN
8/11
Height 9"

DESTROYER U.S.S. BENNION 7/6
Length 8¼"

INDIAN CHIEF
8/11. Height 10"

PLAYCRAFT AURORA HOBBY KITS

Send 3d. Stamp for Catalogue to **DEPT J, PLAYCRAFT TOYS LTD., 120 MOORGATE, E.C.2**



SOME of the best wine and spirit labels come from France and Spain. Beginners who concentrate on these countries will be rewarded with a picturesque collection worthy of merit.

For making a sparkling wine, like champagne, the grapes are picked before they are quite ripe; for a rich-flavoured wine, such as port, the grapes must be fully ripe; for sour wines, like Rhine wine, picking is put off as late as possible.

WINE AND SPIRIT LABELS — *By R.L.C.*

The grapes are crushed by men who get into the wine-press and tread them down with their naked feet. The juice runs through the holes in the bottom into the vat, and when this is nearly full it is left to ferment or work. This may take a few days or only a few hours, according to the heat of the air. When the juice, which is called the must, begins to ferment, little bubbles of carbonic acid gas rise up through it, caused by the turning of the sugar of the juice into alcohol. The must soon becomes muddy and warm, and froths much on the top, so as nearly to fill the vat, but after a time it settles and gets clear and cool. When cold it is racked.

'Sweet' and 'Dry'

Wines have to be watched very carefully while fermenting, as their excellence depends on this. Some grape juice contains much more sugar than others if the fermentation stops before all the sugar is turned into alcohol, the wine is much sweeter than if all the sugar has been fermented.

Wines having much sugar in them are called 'sweet' wines, and those with but little sugar 'dry' wines. Malaga and Tokay are sweet wines, and Madeira, Sherry and Port are dry wines; but there are often both sweet and dry kinds of the same wine. Wines bottled while the fermentation is still going on will have carbonic acid gas in them. This gives them a brisk taste and causes them to foam when uncorked. Such wines are called 'sparkling' wines. 'Still' wines are those which do no sparkle.

As the juice of all grapes is colourless, all kinds of wine would be without colour, or 'white', as they are called, if they were made from juice alone. But when the juice and the skins are fermented together for a time, the wine will have some colour. Even the skins of white grapes will give wine a kind of amber colour, while those of dark grapes makes the rich tints seen in claret and port wines. When wines have not colour enough they are often coloured with logwood, burnt sugar, and other materials.

The chief wine countries in Europe are France, Spain, Portugal, Germany, Italy, Hungary, Greece and Turkey. From France come Champagne, Burgundy, Bordeaux, and many other wines. Malaga and Sherry (named from Xeres, near which it is made) are Spanish wines. Port wine comes from Oporto in Portugal. Rhine and Moselle wines come from Germany. Madeira wine is made in the island of Madeira, off the west coast of Africa, and Tokay in Hungary.

Those who seek pen friends in Spain, Portugal or Germany should write to the Editor enclosing 3d. stamp for reply.

● Continued from page 122

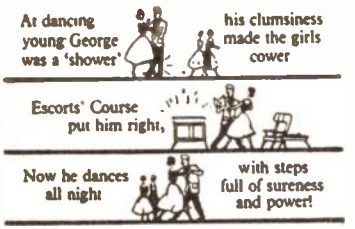
Making Fishing Floats

take an amazing amount of weight in comparison to their size. They are also extremely sensitive due, of course, to their lightness. In fact, this material is so buoyant that, used in the largest diameters you can find — and this may well go to almost ¾ins — and using a length of about 7ins. you can make a float which will take a live-bait for pike. Being slim, the pike feels no resistance such as is set up with the usual egg-shaped float and holds on longer to the bait, which gives one a much better chance to strike.

You will have noted that the only cost is the dowel, a bit of whipping thread, the bit of wire for the loop and the enamel—a very small tin of which will do scores of floats. You need not keep to the pattern I have shown but can make them in numerous shapes as indicated. You can use quills instead of dowelling for the stems.

To finish off the job a pennyworth of cycle valve rubber will provide the float cap, and this pennyworth will make about three dozen caps!

Total cost of a float is less than 2d. With the long dark nights upon us, you will have ample time to make a good selection and you will derive no small amount of pleasure catching fish on the tackle you have made at home.



C n't afford private lessons? Learn ballroom dancing at home! Send for exciting booklet 'Dance Escort'— FREE to readers of *Hobbies*—which explains the miraculous SURE STEP system. Just send name & address to:

ESCORT DANCE INSTRUCTORS
Studio H.16 Harrogate
(or Rock'n'Roll Course—send 4/6 P.O.)

SAVE THIRTY SHILLINGS !

ELECTRIC DRILL ACCESSORY KITS

Sanding Discs – Backing Pad – Lambswool Bonnet – Grinding, Buffing and Wire Wheels with Arbor – Masonry Drill and Wallplugs – 3 Drills for wood – 3 Drills for Metal – Postage Paid – 24/6 – (Usually 54/6) – Lists Free.
BARKERS, 70 WEST STREET, LEEDS 1

STAMPS FREE — Empire Packet including Pictorials and Victorians with approvals. — Robert J. Peck, 7A Kemp Road, Bournemouth.

MUSICAL MOVEMENTS. The largest selection of tunes in England. — Richardson & Forder, 5 Chapel Place, London, N.17.

CLUB PRINTING AND DUPLICATING. Samples and prices 3d. — Bernard Salmon, 107 Shearer Road, Buckland, Portsmouth.

MAKE A MUSICAL BOX for as little as 21/-. New kits and tunes available. Movements 13/- post free. Please send 3d. stamp for free illustrated catalogue. — The Swisscross Co., Dept. B, 202 Tulse Hill, London, S.W.2.

100 DIFFERENT stamps free! Request ½d. upwards discount approvals. — Bush, 53 Newlyn Way, Parkstone, Dorset.

BECOME CHIROPODIST MASSEUR. Postal Schools (Dept. 27), 48A Abbey St., Accrington

KUKLOS ANNUAL. Indispensable cyclists' handbook Tours, resthouses, money-saving hints, 3/- post free. — Burrow, Publishers, 2 Imperial House, Cheltenham.

MEN-WOMEN with spare time, required for new simple weaving work. For details send S.A.E. (Dept. 4) Weava Products, 10 Shelley Road, Worthing.

FULLY TRANSISTORIZED
The VOXETTE TAPE RECORDER

NOW a brand new EXPENSIVELY TRANSISTORIZED tape recorder and play back machine AT EVERYBODYS PRICE. Complete outfit ready to record and play back. £11. 19. 6., carr. 5/-. No more to buy. Records anything — music, outdoor sound effects, sing-songs, parties. Ideal reporters, dictating, etc. Permanent recordings or tape can be used again and again. Further 3 in. spools obtained anywhere. With standard batteries (cost 1/8d. — months of normal use) you can record outdoors — anywhere! Perfect reproduction. Portable. Written guarantee. Or sent for £4, bal. 18 fortnly. payts. 10/10d. LISTS. GUITARS, WATCHES, RINGS, CABINETS, JEWELLERY, etc. TERMS.

Headquarter & General Supplies Ltd. (HOBW/38) 196-200 Coldharbour Lane Loughboro Junc., London, S.E.5. Open Sat.

MOONSCOPES £5-19-6!!
See Moon at close quarters, Jupiter's Moons, Saturn's Rings, etc. Amateur's Astro. Kits £9-7-0 or 10/- weekly. Ideal Xmas gifts. Stamp for lists. Photos 1/- set (returnable). WORLD WIDE TESTIMONIALS.
J. K. M. HOLMES & CO. LTD. (Dept. HI) Scientific Instrument Makers, Martins Bank Chambers, 33 Bedford Street, North Shields, Northumberland.

WHEELS (Hardwood) and Rubber Tyred Metal), Cot, Pram and Doll's House Fittings and Papers, Beads, Transfers, Prints and other accessories. Stamp for new lists. (Trade supplied.) New address — JOYDEN CO., 91 Peplins Way, Brookmans Park, Herts.

'PAINTSPRAYING' HANDBOOK. Covers Car, Industrial & Flock Spraying. 3/6 post 4d. Catalogue of our Cellulose and Paints and all Allied Sundries 3d. — Leonard Brooks Ltd., 81 Oak Road, Harold Wood, Essex.

MODELS. You can make lasting stone-hard models with Sankey's Pyruma Plastic Cement. Supplied in tins by Ironmongers, Hardwaremen and Builders' Merchants. Ask for instruction leaflet.

WANTED — 1939 Big Ben design. Reply — 103 Highveld Road, Kempton Park, Transvaal, South Africa.

HOW TO STOP SMOKING

and permanently overcome that ceaseless craving for tobacco. Save money, safeguard health. Send stamp for details of the world-famous inexpensive Stanley Treatment for tobacco habit.

THE STANLEY INSTITUTE LTD Dept. 30
12 Bridewell Place. London E.C.4

BRASS, COPPER, DURAL, ALUMINIUM, BRONZE
ROD, BAR, SHEET, TUBE, STRIP, WIRE
3,000 STANDARD STOCK SIZES
No Quantity too small *List on Application*
H. ROLLET & Co. Ltd.
6 CHESHAM PLACE, LONDON, S.W.1
Also at
Liverpool, Manchester, Leeds, Birmingham

AGENTS WANTED
LONDON'S LATEST FASHIONS. Most people would like the chance to get to London to choose their new clothes. If you become a spare time agent for FREEMANS, you can save yourself this journey. In FREEMANS free 400-page catalogue you will find something for everybody. All goods on approval and generous commission on all your own, your freinds' and relations' purchases. Write to FREEMANS (LONDON S.W.9.) LTD., Dept. G. 258, 139/141 Clapham Road, London S.W.9.

15/6 CRYSTAL RADIO kit. Easy-to-build with only a screwdriver and pliers. Post free — send 15/6 P.O. ALSO — 1 and 2 valve kits, headphones, etc. — send stamped addressed envelope for complete list to — Blanchard's Radio, Dept. HC8, 13 Gainford Gardens, Manchester, 10.

OLYMPIC Games stamp and 10 beautiful Pictorials free! Five Continents represented. Send 3d. postage requesting bargain approvals. — Greenwood (HA), 9 Moor View Road, Sheffield 8.

BOYS — Build a sailing catamaran. Send for illustrated leaflet. Plans 12/6 per set. Stamp to — J. B. Marine Products, West Coker, Yeovil.

FREE stamp album and 20 stamps. Request approvals, enclosing 6d. Additional gifts given.— Beeze, 8 Langland Villas, Mumbles, Swansea.

SHIP Photographs. Liners. Send 1/3 List, specimen.—Elder, 38 Westview Road, Barrow-in-Furness.

HARDHITTING ACCURATE

Webley AIR PISTOLS
AIR RIFLES · ACCESSORIES
Write for Catalogue
WEBLEY & SCOTT Ltd., 166 WEAMAN ST., BIRMINGHAM, ENGLAND

GRIPS the SCREW AND DRIVES IT HOME INTO THAT AWKWARD SPOT
SO QUICK SO EASY!

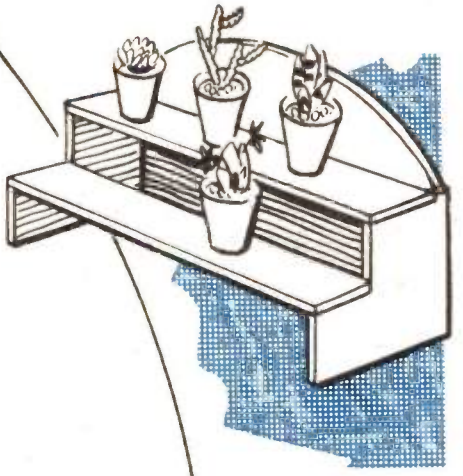
Grips smallest grub screw or large wood screw, firmly, instantly, and drives quickly home! Saves time and temper!
POST PAID 5/- **MAILEX SUPPLY CO (B3), Colwyn Bay, North Wales**

HEAR ALL CONTINENTS
With H.A.C. Short-Wave Receivers
Suppliers for over 18 years of radio S-W Receivers of quality.
One-Valve Kit, Price 25/- Two-Valve Kit, Price 50/-
Improved designs with Denco coils. All kits complete with all components, accessories and full instructions. Before ordering, call and inspect a demonstration receiver, or send stamped addressed envelope for descriptive catalogue.
'H.A.C.' Short-Wave Products (Dept. 22), 11 Old Bond Street, London, W.1.

BE TALLER

In 12 days or money back. New gland and spinal discovery increases height 2 to 5 inches. 'I have gained 4½ inches in height. My weight increased from 9-stone 4-lb. to 10-stone 3½-lb.'—P.D. 'Increased 3 inches.'—H.G. Guaranteed harmless. Full course 10/6 (or $1.50). Air mail 16/3. Details 2d. Sent under plain cover. J. H. MORLEY, 28 (H/186) Dean Rd. London, N.W.2. Practical Courses, all subjects. List free.

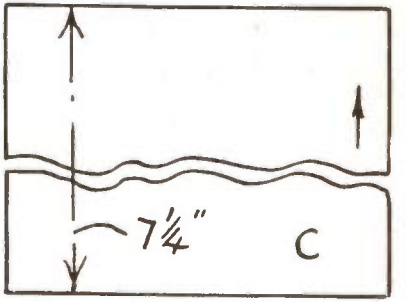
A SMALL CACTI STAND



CUT one piece (A), two pieces (B), and two pieces (C) from ¾in. wood. Piece (A) and pieces (C) must be extended to the measurement shown.

Clean up the pieces with glasspaper and glue or pin together. The back (A) goes between the ends (B) and the shelves (C) are glued on the ledges of pieces (B).

Finish off by painting the whole stand with glossy white enamel. (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.

BUILD the REAL way

WITH BLUEPRINTS BRICKS & MORTAR

BRICKPLAYER

Brickplayer Kit 3	27s. 6d.
Brickplayer Kit 4	51s. 6d.
Kit 3A converting Kit 3 into Kit 4	27s. 6d.
Brickplayer Farm Kit	63s. 0d.
2000 Bricks Pack	55s. 0d.

Extra Bricks, Roofing and Cement in low-priced packs. Windows and doors obtainable singly.

BRICKPLAYER is more than a toy it is the nearest thing to real building yet devised. Each Kit comprises miniature bricks in all required shapes, mortar, roofing, plastic windows and doors, plans and instruction booklet. All models are architect designed to 'O' gauge scale. Can be permanent or dismantled by merely soaking in water and bricks used again and again. Remember, ask for BRICKPLAYER and get the real thing!

COMPETITION **Write for details of the grand Brickplayer Competition, in which you can win prizes of £21 0 0, £10 10 0 and £5 5 0 and a number of consolation prizes.**

At good toy shops, hobby shops and departmental stores.

If your dealer cannot supply, write for leaflet and address of nearest stockist to:

J. W. SPEAR & SONS LTD., Dept H. Enfield, Middx.

YOUR IDEAL XMAS GIFT