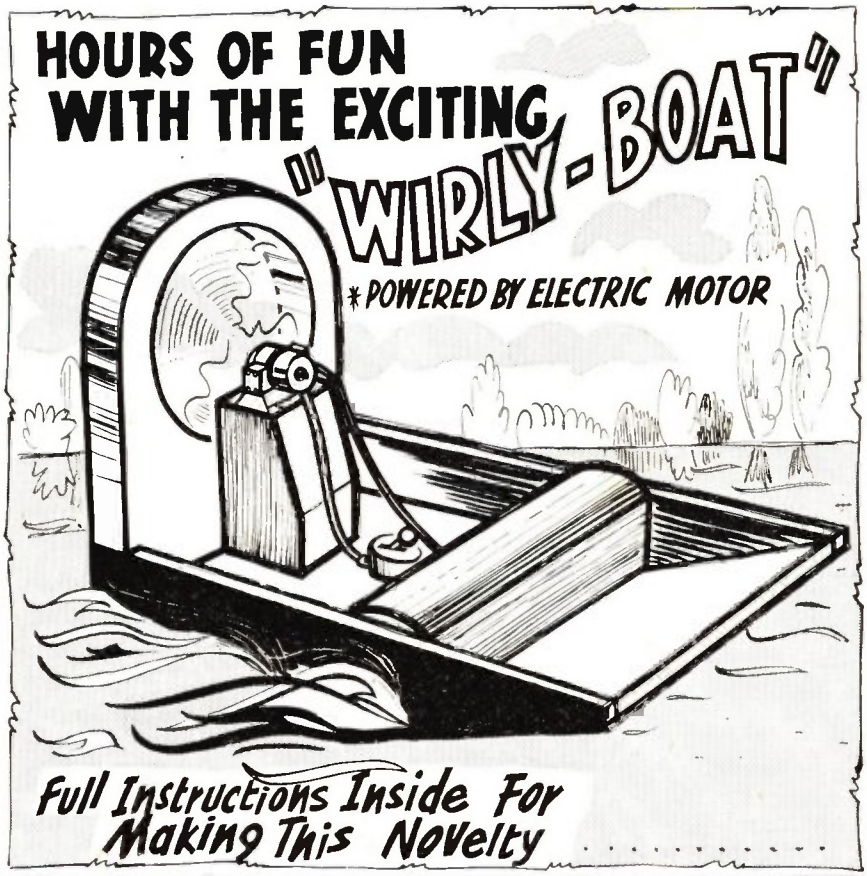
HOBBIES weekly

21st OCTOBER 1964 VOL. 139 NUMBER 3593

HOURS OF FUN WITH THE EXCITING "WIRLY-BOAT"

* POWERED BY ELECTRIC MOTOR



Full Instructions Inside For Making This Novelty

Hobbies

FOR CRAFTSMEN OF ALL AGES

6D

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★ NOTE TO CORRESPONDENTS ★
★ All correspondence on any subject covered in this magazine *must* be addressed to: The Editor, Hobbies Weekly, Dereham, Norfolk. If a reply is required, queries should be accompanied by a stamped addressed envelope and reply coupon inside back cover. ★
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ALL THE LATEST STAMPS

NETHERLANDS

To mark the fact that 125 years ago — on 20th September, 1839 — the first railroad was put into service in Holland a special series of stamps appeared in September. The 15 cent value features

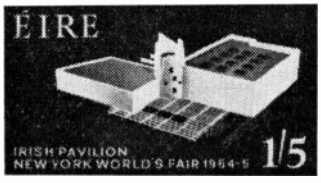
light signals for modern station protection (illustrated). The 40 cent stamp shows an electric train of 1964.

NEW ZEALAND

This year sees a continuation of the bird series and for the first time New Zealand sea birds will be featured. The 2½d. + 1d., depicts the Red-billed Gull and the 3d. + 1d., the Blue Penguin. The birds will be shown as near as possible to their natural colours. The lower value stamp will show two red-billed gulls standing on a sand dune against a sea and sky background and in the other stamp the chosen birds will be shown on a rocky coastline with a sea and sky background.

IRELAND

A special stamp marking Ireland's participation in the New York World's Fair appeared on 20th July. The design (illustrated) shows the Irish Pavilion at the fair.



CANADA

The Charlottetown Conference stamp which was released on 29th July, commemorated the historic meeting at Charlottetown, P.E.1. which lasted from 1st September to 9th September, 1864, and which was the first of a number of steps which led to the creation of the Canadian Nation in 1867. The stamp shows the new Fathers of Confederation Memorial which has been constructed in Charlottetown to mark the centenary of the meeting.

WEST GERMANY

A stamp marking the re-election of the Federal President Dr Heinrich Lubke was issued on 1st July.

Ferdinand Lassalle, the foundation-member of the German Labour Movement, was born in Breslau on 11th April, 1825. A special stamp appeared on 31st August, to mark the 100th anniversary of his death.

PAPUA AND NEW GUINEA

A set of four values appeared on 5th August, devoted to the Health Services of the Territory.

The 5d. design shows a medical officer and a patient at a Health Centre. The 8d. stamp features the School Medical Service and shows a child receiving dental treatment. Infant, child and maternal health is the theme behind the 1s. stamp, which shows a Papuan nurse and child, and the 1s. 2d. value, depicting a student with a microscope, emphasizes the importance of medical training.

Colourful birds of the Territory will soon be in circulation on stamps. Eleven stamps of the present definitive series will be replaced by designs featuring birds. The first group of 6d. 8d,, 1s. and 10s. values was due to be issued on 28th October. The second group of 1d., 2d., 3d., 5d., 2s., 2s. 3d., 3s., and 5s. will appear in January 1965. The present £1 stamp showing Her Majesty Queen Elizabeth will be retained.

The designs will show the male and female of each of the chosen eleven species. The species to be shown on the first group include:

6d. *Parotia Lawest* — Lawes' Six-Wired Bird of Paradise.

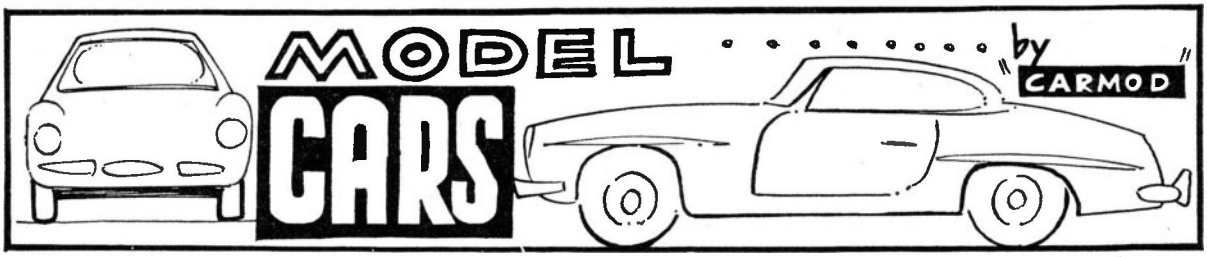
8d. *Drepanornis Albertisii* — Black-billed Sickle-billed Bird of Paradise.

1s. *Paradisaea Guilielmi* — Emperor of Germany Bird of Paradise.

10s. *Ptiloris Magnificus* — Magnificent Rifle Bird.

West Germany 'Resistance' Issue

This set of stamps of much historical interest was issued by West Germany on July 20th. The eight stamps feature personalities in the German Resistance Movement during the 1939-45 War who gave their lives in opposing the Hitler regime.



IT is only in recent years that a two-way invasion by racing cars across the Atlantic has occurred. Not so long ago about the only place where U.S.A. and European-made vehicles could be seen at the same meetings was in the Bahamas during the annual Nassau Week. Now Riverside, Sebring and Indianapolis are among the many American tracks where European cars can be regularly seen and the big Ford Galaxies, Cobras and Chevrolet Sting Rays are no strangers to European circuits.

CHEVROLET GRAND SPORT

The whole concept of competitive motoring is different. Whereas we in Europe talk of 'big 3-litre Ferraris and Austin Healeys', nothing in the States is considered heavy metal unless it is of over 5-litre capacity.

The Corgi model of the Chevrolet Sting Ray makes good basic material from which to chop a representative American sports vehicle — the Grand Sport.

Firstly, the model must be stripped down to its components by filing off the button-ended pegs on the underside of the car. Taking the body shell first, the piece of metal dividing the rear windows must be removed with a hacksaw blade and the edges around the window smoothed off with a file.

The headlamp assembly, which, on the original model flicks into two positions, should be cemented back on to the body shell in the 'closed' position — this being more appropriate for racing. A piece of clear plastic sheet is cut and cemented in position to form the rear window. The original rear window cannot be used as this has a ridge which accommodates the division. The rear window part should be cut off the clear plastic moulding and the part forming the front and side windows cemented back in place. If desired the side windows can also be cut off to give the impression of open windows.

'Wheel arch overhangs' are made for all four arches from strips of paper which are cemented into the edges of the arches. Plastone is then used to fair in the overhangs.

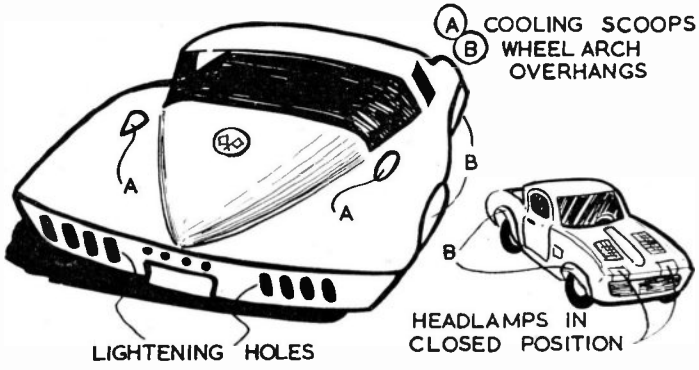
Attention can now be given to the interor. The golf clubs on the rear platform should be filed off (not quite suitable for racing). The seats, steering wheel, etc., can now be detailed with a paint brush and the interior unit cemented back in the body shell.

The only parts needed from the 'silver plated' plastic unit are the two mesh filters to fill the gaps on the bonnet top, and the radiator front. The latter should be filed smooth to eliminate bumper bars, painted black. All other silver parts are cut off and rejected. Cement in place the radiator front and the mesh filters.

The model is now ready for re-assembly: the wheels and axles put into position on the chassis plate and this cemented into place. The gaps in the under edges, caused by leaving out the plated parts, can now be filled with Plastone. Two air scoops, in line with the rear window are formed *in situ* from Plastone and this completes the structural alterations to the model.

It is suggested that only 'below waist' painting need be done as the original colour on the upper surfaces need not be disturbed except for a small area above the rear window. White is a suitable colour for the painting which has to be carried out. Black paint dots represent the 'lightening holes' at the rear end and the disc brake cooling slots behind the front wheel arches. Finally, suitable sized number disc transfers are applied.

The Corgi Sting Ray model can also be used to build up a replica of the Ferrari 250 GT with the Drogo Speciale body as raced by Chris Kerrison — but that is another story.



TWO PUNS IN A LIGHTER MOOD!

TWO shipwrecked sailors on a raft were dying for a smoke — but they had only 3 cigarettes and no matches. Thinking deeply, one sailor threw a cigarette overboard. This, he explained, was to make the raft 'a cigarette lighter'. He immediately seized the lighter and lit up the other two cigarettes.

Put a cigarette lighter in your friend's left hand — and put a matchstick into his right hand. Then ask him to clench his fists. Afterwards, ask him which is heavier. He'll almost certainly gesture casually with the hand concealing the lighter. Whereupon you say 'No — No — don't be silly, that's the LIGHTER one!' (A.E.W.)

QUITE good reception can be had with a 1-valve receiver, and the set described here is easily made.

A chassis or baseboard about 8 by 4½ in. is suitable, with a panel about 8 by 5 in. This leaves space for a second valve, as amplifier, which will be described in the next article.

3—ONE VALVE RECEIVER

By 'Radio Amateur'

Parts needed

Most of these can be identified from the diagram, but a list may be helpful.

C1. 150pF or 200pF air spaced S.W. tuning capacitor.

C2. 200 pF or 300pF reaction capacitor.

Small tuning dial, or knob with scale.

Knob for reaction, 1 in. or 1½ in. dia.

On-off switch.

1T4, CV785, DF91 or W17 valve.

B7G valve holder.

Two twin socket or terminal strips, for aerial, earth, phones.

100pF fixed capacitor. 5·6 megohm ¼-watt resistor.

Small short-wave radio frequency choke.

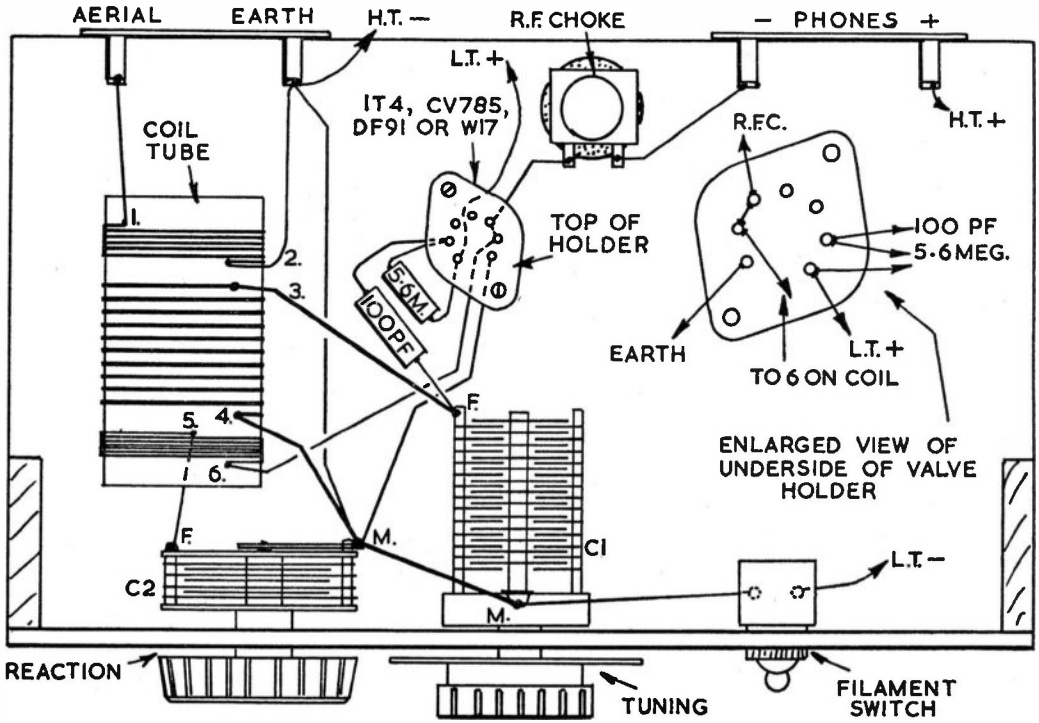
Few feet coloured flex for battery leads.

Insulated tube about 2½ in. long by 1½ in. dia. 26 s.w.g. enamelled and 20 s.w.g. enamelled or bare wire.

Somewhat similar parts may be used, if to hand. Ready-made single or plug-in coils are also satisfactory.

Building

The diagram shows the layout and all connections. The panel can be plywood, but hand capacity effects will be less if it is aluminium, or backed by stout metal foil, or sheet zinc or aluminium. Brackets or wooden corner pieces brace



Layout and wiring of a short-wave receiver

the baseboard and panel, to avoid movement.

The reaction capacitor C2 and filament switch are mounted in holes about 1½ in. from the bottom of the panel. C1 is in the panel centre. When wiring C1 and C2, note that M is the moving plates tags, and F the fixed plates.

To wire the valveholder, place it with the underside up, and solder on leads as in the enlarged view of the underside of the valve holder. Then turn the holder over, and place it as in the top of holder view. Fix it with two ¾ in. screws, with ½ in. spacers or wooden blocks between holder and baseboard.

Connections in the set can be with the 20 s.w.g. wire, with flex for battery leads. Use proper battery plugs, or identify the leads. A 67½V battery is used for H.T., and a 1½V battery for L.T.

Coil

A single coil covering about 19–40 metres will be most useful. This has ten turns of 20 s.w.g. wire between points 3 and 4, turns being spaced so that the winding is ¾ in. long. Five turns are used between 1 and 2. These turns are side by side, and about ¼ in. from the larger winding. Eight turns are required between 5 and 6, again side by side, with about ⅛ in. space to the larger winding. Turns must all be the same way, as in the diagram.

The ends can pass through small holes, and are cut just long enough to reach the various connecting points. The coil is fixed with two ½ in. screws, with ¼ in. blocks or spacers under it.

Using the set

Connect an aerial and earth as previously described, and medium or high resistance headphones. C2 is set fully open. When the set is switched on, slowly close C2 until a whistle is heard, when tuning past a station.

Conditions for maximum sensitivity are when C2 is adjusted so that this whistle just fails to arise. It is necessary to adjust C2 with the left hand, while tuning with the right hand. If C2 is not correctly operated, nothing will be heard except powerful, local stations.

Tuning is very critical, but band-spreading, or a reduction drive, may be added as described later. Many stations are congregated into narrow bands, as previously explained.

It is possible to receive CW Morse code by adjusting C2 so that the set is just oscillating. This would give a continuous whistle with an ordinary station, but will produce Morse, with a CW transmission.

Other coils

This set will work well on other bands. The simplest method of changing bands is to use two or three plug-in coils. Ready-made plug-in coils can be purchased. Or ribbed formers with pins may be bought, and wound at home. Alternatively, if a number of old valve bases of the same type are to hand, Paxolin tubes can be fixed to them. Several coils can then be wound. Connections go down to the same pins, with each coil, so any coil can be plugged into a holder.

The 50–110 meter band can be covered by using a coil with 28 turns of 24 s.w.g. wire, occupying 1¼ in. winding space on a 1½ in. diameter tube. For aerial coupling (1 to 2) 10 turns of 28 s.w.g. or similar wire may be used, with 17 turns for reaction (points 5 to 6).

If medium-wave coverage is wanted, 90 turns of 32 s.w.g. enamelled wire, turns side by side, will do for tuning (3 to 4). For aerial coupling, 30 turns of any thin wire (say 36 s.w.g.) will do, with 50 turns for reaction. The tube should be 1¼ in. to 1½ in. in diameter. To tune the whole MW band, C1 should be 500pF.

If ready-made coils are adopted, follow the connections given by the coil maker. The coils must be for a battery receiver, and have reaction and aerial coupling windings. Most single coils have tags, to which leads are soldered. Plug-in coils are made for various holders. The holder is screwed fairly near C1 and C2, and wired up according to the maker's diagram.

Ways of increasing the volume from the 1-valver will be described in a following article.

JODY MILLER

JODY MILLER was singing at a small coffee-house in Norman, Oklahoma, called 'The Jester' when she was approached by three arty-looking gents from the audience. Get to Hollywood, they told her, and get there fast. The three gents were the Limeliters.

And Jody got there. She gate-crashed actor Dale Robertson's office and asked for his help. Just like that. Dale liked her voice, called a friend at Capitol, and she was on wax within days.

Jody is 21, a slight, petite girl with big eyes and long dark hair who looks rather like a younger Audrey Hepburn. She started singing to the accompaniment of a baritone ukelele instead of the inevitable acoustic guitar — for the simple reason that a guitar was too big for her to play.

He Walks Like A Man was Jody's first 'single' release in this country — a powerful stylish song which was put out on Capitol CL15335. Hank Levine came up with an original and very imaginative arrangement, and Jody's voice belts out the lyrics in great style. The flipside is *Looking At The World Through A Tear.*

GARDENS IN MINIATURE

By Anne Bradford

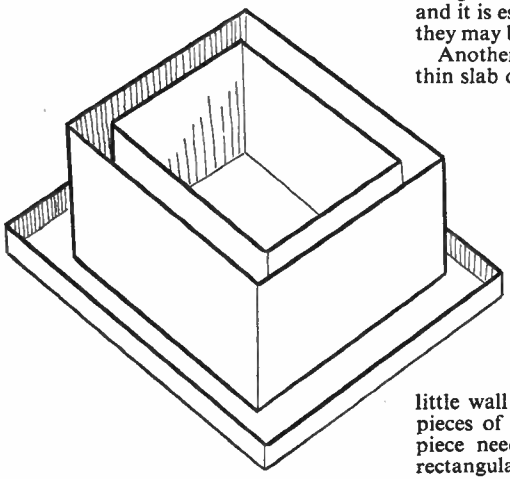
MINIATURE gardens have become very popular, and can easily be made at home for holding cacti or succulents. Apart from the fun of making these they are attractive as presents at any season of the year.

It is possible to buy small concrete bowls or troughs ready prepared for this purpose, as shown in our photograph, but a 7 lb. bag of pure cement will enable you to make various kinds of containers. The following suggestions should help you to make several different types, sizes or shapes.

Obtain a few cardboard boxes, and after covering the table with old newspapers, lay the lid of a large box on same for the base. Now take another box, say, about 9 in. by 5 in., and remove the bottom, placing this on the lid. This is the start of our mould.

Mix the cement in a bowl to a reasonably stiff consistency, making a ½ in. layer at the bottom of the box. When this has been done, smooth and cut out two drainage holes with an apple corer, inserting a small cork in each, so the cement will not fill.

Now take a smaller box, which fits inside the other, leaving a gap about ¾ in. between for the walls. Place this box on top of the base layer, and add cement between the two. Add a little at a time all round the walls, so that the latter build up gradually. Make them about 4 in. high, smooth off the top and leave to dry out. This method is shown in the diagram.



A mould for rectangular containers

Such troughs take about a week to dry when you may peel off the cardboard from inside, outside and bottom, and remove the two corks. Should there be any cracks on the outside walls these can be filled in with a mixture of cement, and smoothed over. Remember that larger troughs may take a little longer to dry, and it is essential to exercise patience, or they may break if handled prematurely.

Another way is to look around for a thin slab of stone or slate, building up a little wall all the way round with other pieces of thin, broken stone. The basic piece need not be perfectly square or rectangular, and it is often the odd shapes which look most attractive. Cement is again used for setting the small pieces of stone to make the walls.

Yet another way is to mix some cement to a thick consistency, roll out like pastry, and cut out like bricks, which can then be built up accordingly. When adopting this method remember it is advisable to make a few half bricks.

Finally, you may lay small stones or pebbles close together in a box lid, and cover with a layer of cement to bond together. This will make the walls, which can then be joined to a base as previously mentioned.

Remember to provide small drainage holes. The cement mixture should be reasonably stiff, and do allow ample drying time.

When a pot is ready for filling, we need a mixture of sand and peat, with only a little soil. While we wish to provide sufficient water and air, we do not wish to encourage too much growth, so we recommend 3 parts silver sand, 2 parts fine peat, and 1 part soil.

Spread a layer of this mixture at the bottom of a trough, add the plants, and press more of the mixture around the roots, but do not ram the soil. And do

● **Continued on page 39**

MYSTIFYING CROSS PUZZLE

THIS cute little puzzle will mystify your friends, and unless they know the secret it is unlikely that they will be able to solve it. Being quite easy to make, it is well within the capabilities of the average handyman with a few simple tools.

The puzzle is made up of two pieces of wood — the upright A, which has a cross piece B passing through a mortise in it (Fig. 1). The idea of the puzzle is to release and remove this cross piece. In Fig. 2 the cross is shown cut in half to indicate exactly how it works. The cross piece B is held secure by the plunger C, and this in turn is kept in place by the ball D.

The ball D cannot drop down towards F because it is slightly larger in diameter than the tube in which the plunger slides. It can, however, move towards E on account of the larger diameter, and when this happens the plunger C is free to drop down, and, therefore, release the cross piece B for easy removal.

For the upright choose a piece of straight grained wood 5 in. long and 1 in. square, and for the cross bar a piece 4 in. long, 1 in. wide and $\frac{3}{4}$ in. thick. Cut a neat mortise in the upright, so that the cross bar will slide in. Do not make it a tight fit, nor should it be a sloppy job.

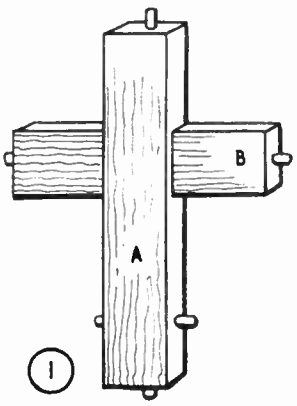
Drill a hole through the centre of the bottom part of the upright A, extending from F right into the mortise. Drill another hole near the bottom on the right side, as shown in Fig. 2, marked E, but this must be slightly larger than the former hole, and goes only half way through the upright.

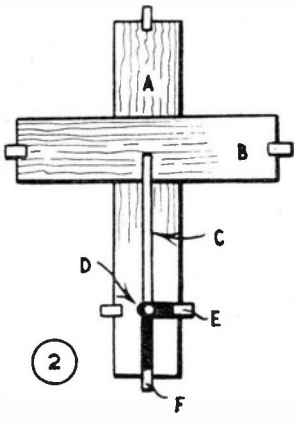
Both these holes must be quite smooth, and the best way to ensure this is to roll up a strip of glasspaper, and to push it up and down, and turn it round until all roughness is removed.

The hole C must be extended about halfway into the cross bar, and in order to make it easier to assemble the cross, it can be made slightly larger in diameter.

The plunger C can be made from dowel rod, but a heavy metal rod such as brass would act much better. It is necessary to cut the plunger to the correct length, and this will be found partly by measurement, and partly by experiment. When it has locked the cross bar securely, the ball should just fall into place with a very slight amount of play.

In assembling the parts first slip in the plunger, then glue in the plug F. Next put in the ball, which is a cycle ball-





bearing, and secure the plug E.

The rest of the plugs are just fakes and, of course, add to the mystery of the puzzle. To dismantle the cross first gently tap the plug E on the table or other hard surface, then do the same with plug F, while holding the cross in an upright position. In putting it together again you just reverse the process. (E.)

● **Continued from page 38**

GARDENS IN MINIATURE

not let roots come into contact with the trough or any crocks covering the drainage holes. Continue until the mixture is level with the top of the walls, adding pebbles, grit, or bits of stone for decorative purposes.

What kind of plants can be used for these troughs?

We have all kinds of cacti and succulents at our disposal which are slow growing, and need a minimum of attention. There are also some dwarf specimens of Japanese trees, but these may be expensive. We would also suggest that many hardy rock plants and alpines are useful for these purposes, and most nurserymen will be able to supply your needs at small cost. You will also see plenty on sale in some of the chain stores.

Cacti are admirable subjects for these small troughs, being fairly well behaved. You should never put any fertiliser in with the soil mixture, although they are fond of a little lime. Many people believe that cacti do not require water, but this is a fallacy. They are desert plants from necessity not from choice, and like water as other plants, although, perhaps, not so much is needed. During hot sunny weather a daily watering is advisable; during dull weather every three days is sufficient, and even less during the winter months.

Dwarf specimens are best for our purpose, and there are many different varieties of the prickly pear, Opuntias and Cereum.

The succulents also make delightful plants in small troughs, requiring a minimum of attention. Once again you should select dwarf specimens such as Sedums, Sempervivums, Acoris grandiflora, Crypanthus, Sansevieria and Ficus. Do not be alarmed by these names for a visit to a nurserymen will probably reveal that these are quite popular specimens. And, as already stated, you can often find dwarf alpine rockery plants which will ultimately flower to give a nice display.

Instructions for making

ELECTRIC WIRLY-BOAT

IF you want to make a model that is different, try this novel 'Wirly-Boat', so called because the motive power is not the usual screw, but a propeller. The original which prompted the design, was intended for use on shallow swamps where the conventional boat is practically useless. With this type of boat however there is no screw to get fouled up with weeds and submerged bushes. The model illustrated has the same attributes and can be sailed on shallow water, in fact, you can even sail it on a large puddle.

DIAGRAMS ON FACING PAGE

The motive power is a tiny electric motor (Hobbies No. '01') which costs less than 5s. 0d. to buy. The propeller is carved from a piece of stripwood and is fixed directly to the shaft of the motor. A small battery and a switch complete the power unit.

The diagram in Fig. 1 shows the side view giving the position of the various parts and showing the electric motor in position on its support. Notice that the main parts are numbered in conjunction with the instructions for easy assembly.

Commence by cutting out pieces 1, 2, 3, 4 and 5 from $\frac{3}{16}$ in. wood, using a fretsaw. Glue them together, using waterproof glue, as shown in Fig. 2. Note that pieces 4, 2, 3 and 5 go between the sides 1. The motor support 6 consists of two pieces of $\frac{1}{4}$ in. wood glued together to give the required thickness.

The propeller guard 7 is shown in Fig. 3 and should be enlarged by the square method. It is cut from $\frac{1}{4}$ in. wood to fit exactly between the sides 1. The propeller is cut and shaped from $\frac{3}{8}$ in. square stripwood the length being approximately $3\frac{3}{8}$ in., Fig. 3 shows the shape. The blades should be shaped away on both sides to give a pitch as indicated in Fig. 4. Make sure that the propeller balances before fitting it to the motor. The centre should be drilled and then pushed on to the shaft of the motor. It should of course be a tight fit. Screw the motor to the top of the support 6 and wire up to a small switch and battery as shown in Figs. 1 and 2. The battery should be a VIDOR V15 which will fit between the pieces 5. Contacts at each end should be made from pieces of springy brass as in Fig. 5. They are fixed to the side by means if small round-head screws.

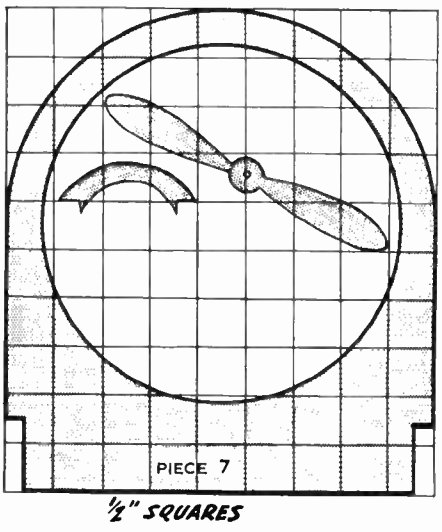


Fig. 3

The battery cover is also shown in Fig. 5 and is constructed from two shaped formers of $\frac{3}{16}$ in. wood over which is glued a piece of thin card. The shape of the formers is shown in Fig. 3.

The boat is completed by adding a rudder as shown in Figs. 1 and 2. It is made from wood and wire and is fixed in the position shown.

Clean up all round with glasspaper and give two or three coats of outdoor quality paint. A good finish will be obtained if each coat is rubbed down lightly before applying the next. If the boat runs astern, change over the battery leads. (M.h.)

A PENDULUM PULSE-TIMER

A CONKER swinging freely upon a long string is a pendulum. If you count the number of back and forth movements or 'beats' which occur in a minute, and repeat the experiment three or four times, you will discover that, however far the conker moves, the number of beats indicated in a minute is always roughly the same.

Galileo is said to have discovered this important property of a pendulum when he employed his own pulse as a simple 'clock' to time the swinging beats of a great lamp in Pisa Cathedral, Italy. But you can perform Galileo's experiment in reverse, and thereby estimate your own pulse rate.

You must know that the beat of a pendulum one metre long (one hundred centimetres, if you measure with an ordinary ruler) takes almost exactly one second. Make a 'seconds beating' pendulum by tying a metal nut 'bob' to one end of a light string. The distance between the centre of the nut (a point in space) and the far extremity of the string must be precisely one metre.

Test your pendulum against an accurately timed minute, using a watch or clock with a seconds hand.

Grip the 'top' of the string between the nails of your forefinger and thumb, and let the pendulum swing freely for one minute while you count the number of its beats. Do not worry that air resistance and gravity keep shortening the distance travelled by the bob, as, within reasonable limits, this loss of energy does not affect the duration of the beats. Your pendulum should give almost exactly sixty beats in one minute.

You can feel your own pulse by placing the *fingertips* of your right hand upon your left wrist, in the general region at the base of your thumb. Soon you will feel a rhythmic throbbing sensation as blood is pumped in successive waves through arteries there. Your 'pulse' rate is the number of regular blood surges you can feel in one minute.

Let a friend hold your pendulum and time a minute for you by counting 60 beats of the bob, while you concentrate upon feeling and counting your pulse rate.

Between 65 and 75 pulse surges per minute is generally regarded as 'normal', although a slightly higher or lower rate might be quite normal for you. Athletes often have rather low pulse rates, except when they are running or jumping. Run up and down stairs and take your pulse again. Is the rate doubled? Vigorous activity demands more oxygen and blood sugar to provide energy to work your muscles, so your heart pumps blood faster to increase the supply of these substances. (A.E.W.)

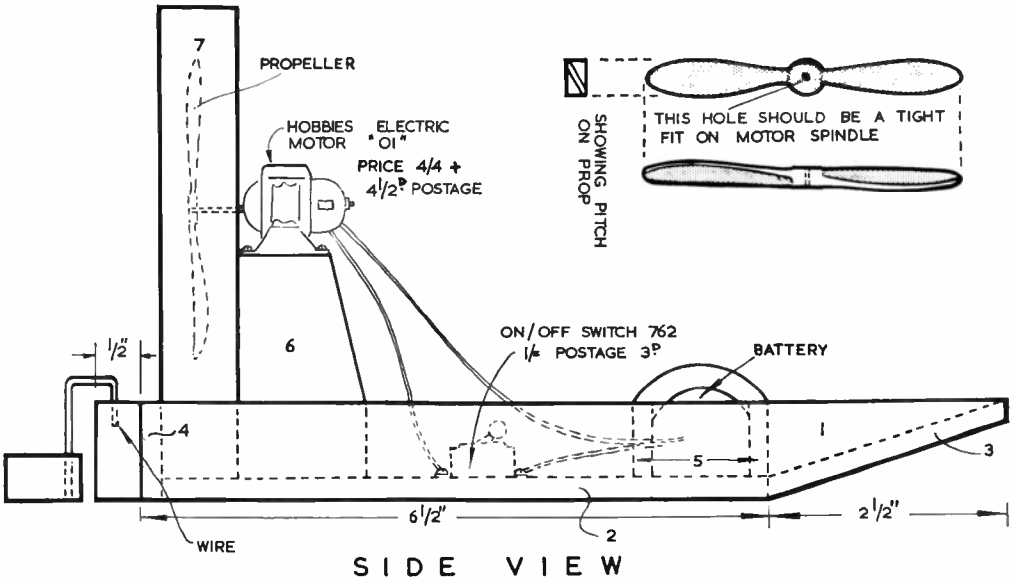
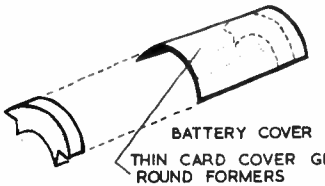


Fig. 1

Fig. 4

THE WIRLY-BOAT —

SEE ILLUSTRATION ON FRONT COVER



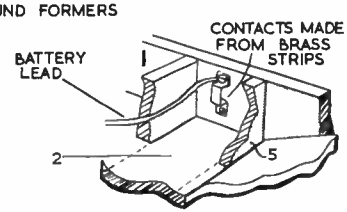
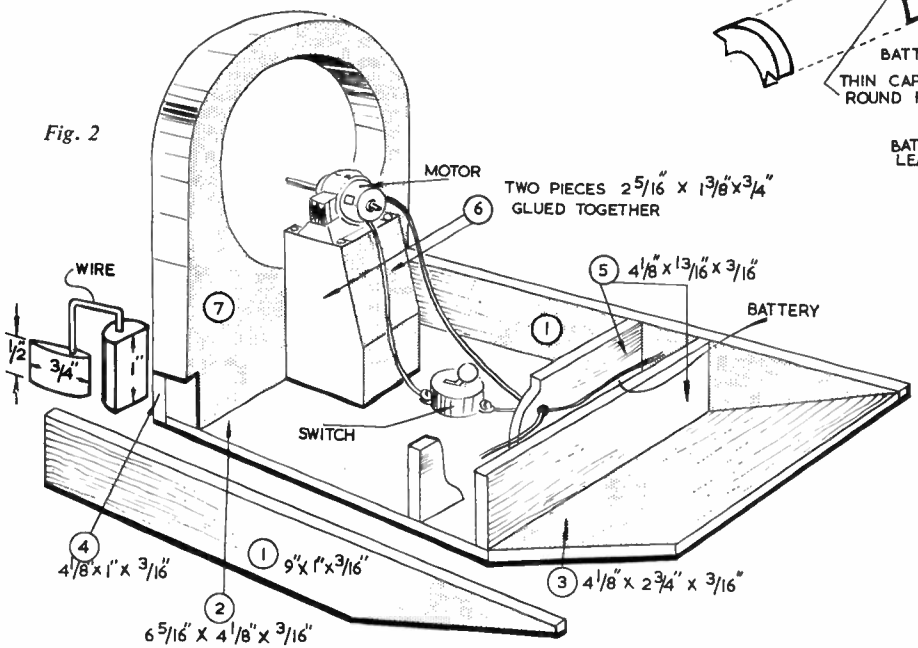


Fig. 5

Fig. 2



Electric motor and switch shown in Fig. 1 available from: Hobbies Ltd., Dereham, Norfolk branches & stockists

See page 45

CHEMISTRY AT HOME

Part 1—

EXPERIMENTS IN FERROUS SULPHATE

ONE of the first chemicals the home chemist is likely to acquire is ferrous sulphate, $FeSO_4.7H_2O$. Chemistry set booklets do not suggest much experimental work with it and the average textbook gives little information. Yet there is much that can be done with simple equipment. Further, the chemical is very cheaply bought from any pharmacist.

One little-known fact about ferrous sulphate is that it may be used as the source of steady stream of sulphur dioxide, SO_2, a source much safer than the conventional methods which involve the use of concentrated sulphuric acid, H_2SO_4.

The ferrous sulphate must first be partially dehydrated by leaving the green crystals in the domestic oven until they form a creamy mass. It now contains about 1 molecule of water, thus, $FeSO_4.H_2O$.

Mix thoroughly 17 grams of this with 6·4 grams of flowers of sulphur. It may be stored ready for use in a well-closed bottle. On heating it decomposes into ferrous sulphide, FeS, water and sulphur dioxide:

$$FeSO_4.H_2O + 2S = FeS + H_2O + 2SO_2.$$

As a little unchanged sulphur may pass over in the heating the gas should be washed by bubbling it through a small quantity of water before using it for the experiment in hand. The apparatus shown in Fig. 1 is simple and convenient. The residue of ferrous sulphide need not be thrown away. It may be used in place of bought lump ferrous sulphide for producing hydrogen sulphide, H_2S.

It has been seen that when ferrous sulphate is moderately heated it merely loses some of its water of crystallisation. On heating to a higher temperature, however, it first loses the rest of its water and then breaks down completely into ferric oxide, Fe_2O_3, sulphur dioxide and sulphur trioxide, SO_3:

$$2FeSO_4 = Fe_2O_3 + SO_2 + SO_3.$$

This reaction forms the basis of the manufacture of fuming sulphuric acid, which is sulphuric acid containing various amounts of dissolved sulphur trioxide. In industrial practice the ferrous sulphate is first carefully roasted in air so as to produce a basic salt which gives a product free from sulphur dioxide. However, for the purpose of demonstration ferrous sulphate will suffice.

Rig up the apparatus shown in Fig. 2. Heat some of the partially dehydrated ferrous sulphate in the test tube. Oily drops of fuming sulphuric acid collect in the adaptor and white fumes of sulphur trioxide will be seen to issue from the lower end of the adaptor. If you hold a damp slip of blue litmus paper in them the paper turns red, owing to formation of sulphuric acid:

$$SO_3 + H_2O = H_2SO_4.$$

When the reaction is over and the residue in the test tube darkens no more, stop the heating. Let the apparatus cool and then empty out the ferric oxide. This is not only useful for preparing ferric salts, but forms a valuable and widely used cheap pigment and polishing powder. It is variously known as jewellers' rouge, red oxide, Venetian Red, colcothar and Indian Red. Besides being used in paints and for polishing gems it is the usual pigment of red tile polish.

Ferric chloride, $FeCl_3.6H_2O$, an important laboratory reagent, may be prepared from ferric oxide by making a slurry of it with hydrochloric acid, HCl, diluted with its own volume of water, warming the mixture and adding more ferric oxide until no more will dissolve. Filter the orange coloured solution so obtained:

$$Fe_2O_3 + 6HCl = 2FeCl_3 + 3H_2O.$$

Evaporate it to dryness on the water bath and bottle the brownish-yellow solid ferric chloride while it is still warm, for it is very deliquescent.

With ferric chloride and ferrous sulphate another oxide of iron, Fe, may be made. Namely, ferroso-ferric oxide, Fe_3O_4. This has the curious property of being attracted by a magnet, and is, in fact, the essential component of the loadstone, a mineral whose curious magnetic properties gave Man the impetus to find out all about magnetism.

To prepare this curious oxide mix solutions of 3·47 grams of ferrous sulphate and 3·37 grams of ferric chloride each in 25 ml. of water. Stir in a solution of potassium hydroxide, KOH, until a drop of the mixture indicates an excess of the hydroxide by its turning red litmus paper blue:

$$FeSO_4 + 2FeCl_3 + 8KOH = Fe_3O_4.4H_2O + K_2SO_4 + 6KCl.$$

Wash the black precipitate by decantation until one wash water does not give a white turbidity when a sample is added to a solution of lead acetate, $(CH_3.COO)_2Pb.3H_2O$. Filter off the oxide and dry it either on a porous brick or, more quickly, in the domestic oven. It shrinks greatly during the drying process. Bring a magnet near to the mass. It leaps to the magnet.

It will be noted from the formula that the oxide is combined with water. To prepare the true anhydrous oxide powder it and heat it until it gives off no more

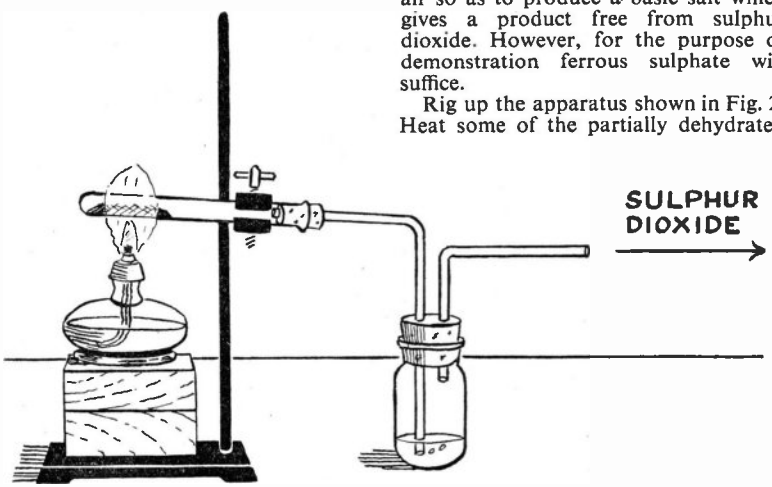


Fig. 1—Sulphur dioxide from ferrous sulphate

steam (indicated by a slip of glass not misting when held above it):
$Fe_3O_4 \cdot 4H_2O = Fe_3O_4 + 4H_2O$.

Test this also with a magnet. It will be found to be magnetic and will even crawl up the side of a bottle containing it when the magnet is passed upward outside the bottle.

An important use for ferrous sulphate is in blue-black writing inks. It has the property of giving blue-black colourations with tannic acid, $C_{76}H_{52}O_{46}$, and gallic acid, $C_6H_2(OH)_3.COOH.H_2O$. On writing with mixed solutions of these three compounds the colouration does not appear immediately. It requires exposure to air for its development. Consequently it is usual to add a little dyestuff to tide over this period. In this connection it will have been noted that fresh writing with blue-black ink is not very dark, but that after a few hours it darkens markedly. At one time an extract of oak galls was used, for these contain gallic and tannic acids. Nowadays, it is more usual to employ the pure acids.

To make up a first-class blue black writing ink and which is suitable both for steel and fountain pens first dissolve 4·68 grams of tannic acid and 1·52 grams of gallic acid in 100 ml. of hot water. Next mix 1·5 ml. of strong hydrochloric acid with 100 ml. of water, heat up the water and dissolve in it 6 grams of ferrous sulphate. Dissolve 0·4 grams of phenol and 1·4 grams of Soluble Blue in 100 ml. of hot water. Now mix the three solutions and make up to 400 ml. with water.

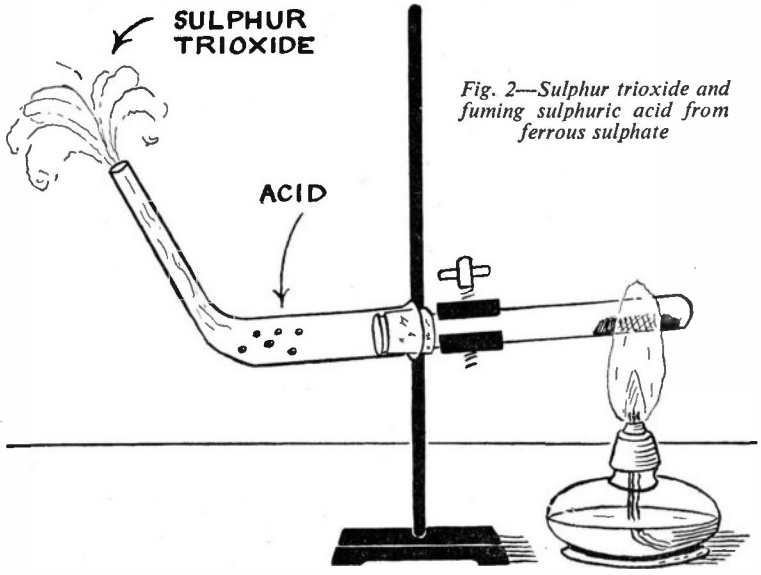


Fig. 2—Sulphur trioxide and fuming sulphuric acid from ferrous sulphate

Various ways with Scallop Shells

By D. H. Nicholson

ANY fishmonger who sells scallops will be pleased to give you some of the beautiful shells, which can be used in a variety of ways.

First soak the shells in a bucket of water overnight, scrub well and leave to dry thoroughly before use.

Pin Trays

When covered in velvet, the shells look attractive on a dressing table. Use Copydex, or other adhesive suitable for material, and spread a *thin* layer over the inside of the shell, working it well down into the grooves but not carrying it quite out to the edge. If you use too much adhesive it will come right through the material and leave a mark, but there must be enough to hold the velvet down into the grooves.

Glue on the velvet first, before attempting to cut it to shape. Place the edge of the material against the straight edge of the shell and press into the hollow and along the centre rib. Then work out from the centre, pressing well into the grooves and smoothing out all creases.

Turn the shell over and repeat on the back, either with the same material or a different colour. Cut close round the edge of the shell through both thicknesses of velvet. Finally cover the edge with narrow braid in a contrasting colour, using thread the same colour as the braid. The kind of braid used for trimming lampshades is suitable.

Because of the curve of the shell, it is easier to sew on to the back velvet first, then double the braid over the edge and sew to the inside, with the join at the centre of the straight edge.

Ash trays

If you are not worried about scratching the furniture, you can simply paint the back of the shell and use it as an ash tray. It is better, however, to cover the back. Using slightly thinner material, turn the edges under before sticking so that no braid is necessary.

Flower containers

The larger scallop shells hold quite a lot of water and make artistic containers for small flower arrangements. Usually they need to be given 'feet' to make them stand firm. Cockle shells are suitable, as they stand flat and their lines pick up the fluting on the scallop shell.

With the base of the scallop resting on the table, only two cockle shell feet are necessary under the curved front edge. Use strong glue or a thick mixture of Polyfilla to fix the feet in position, making sure that the scallop stands absolutely level so as to hold the maximum amount of water.

If a raised effect is wanted, a pedestal can be made of three shells (e.g. whelks) close together in a triangle (filled in with Polyfilla) under the centre of the scallop. When dry the backs of the shells can be painted with clear lacquer.

Indoor gardens

The smallest scallop shells make attractive 'ponds' for indoor gardens.

AUDIO TYPING AND WRITING

By G. E. Gompers

IN a previous issue of this magazine, I dealt with tapesponding — the sending of little spools of taped messages, etc, through the post to tape pals. Even though as a medium of communication it is better than a written letter, because most people can talk more fluently than they can write, the limitations are obvious. The chief drawback is that not all one's correspondents have tape recorders. From a free-lance point of view (i.e., mine) tapesponding is only useful for collating information from authorities that have tape recorders.

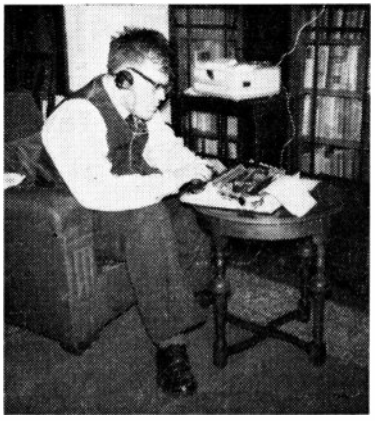
However, the basic idea that people are more loquacious orally than literarily still holds good: but there is no reason why people who dry up after a few words of writing, cannot, with the use of the tape recorder, get their work back on paper.

Audio typing is a fairly skilled job, and the typist is expected to keep up with the recorded or transmitted voice, but the home audio typist or writer does not have to keep up with himself. Not only can he stop his machine — he can turn it back to make sure that he really said *that*, and pause to have second thoughts.

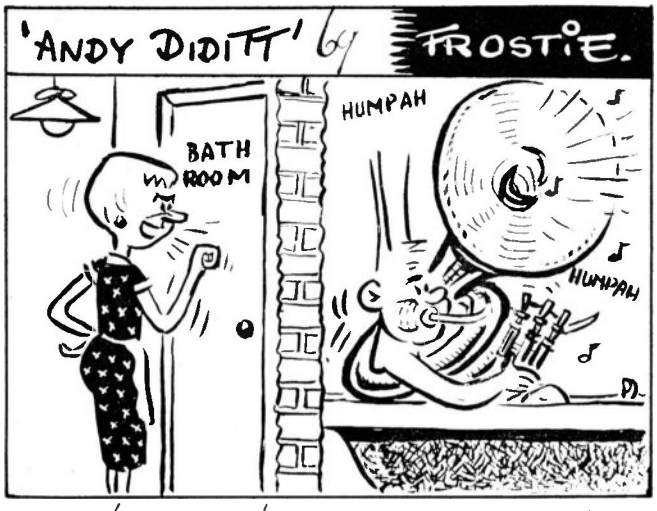
I have always believed that whether communications between friends come or go in letter form or in tape, a person has equal right for privacy for both mediums. As far as recording is concerned this presents no problems. Record in bed and take your microphone with you under the bed clothes.

Listening while you are typing, or hand writing, can easily be solved with the use of headphones and the speaker switched off. The connection is made by putting the bare ends of the headphones lead into the splits of the cable points, which is plugged into the recorder's output socket.

This set up presents little problem in itself, because the recorder is right next to you to make switching on and off and wind-back convenient. There is one thing that could provide a source of annoyance. The fact that you have a double length of wiring, the cable and the head-phones lead, and no distance between you and the tape machine, means that the bulk of it will lie on the floor. Neatly coil this round so that no one can trip up over it. And if you are called away, remember to remove your headphones.



The author being dictated to — by himself



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By Gilbert Davey

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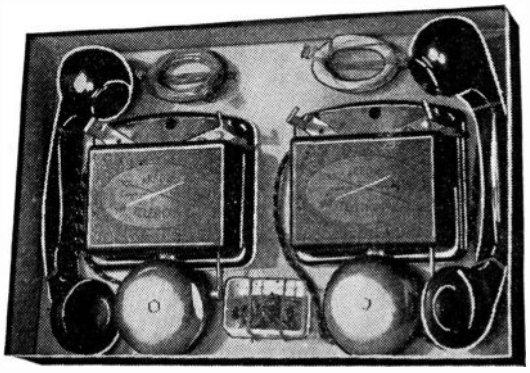

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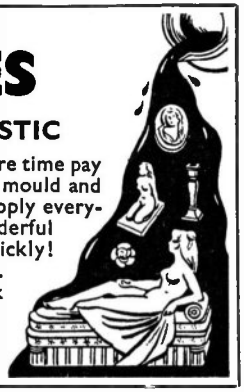

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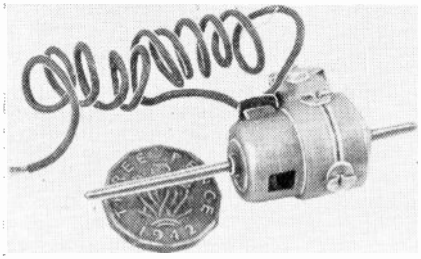

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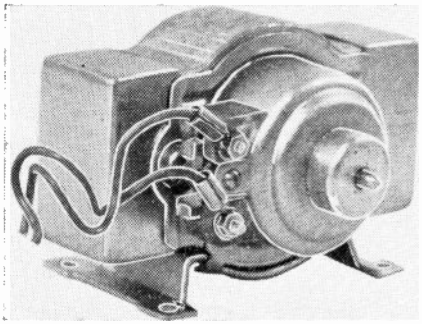

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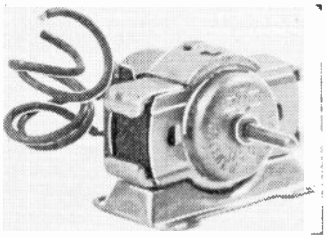

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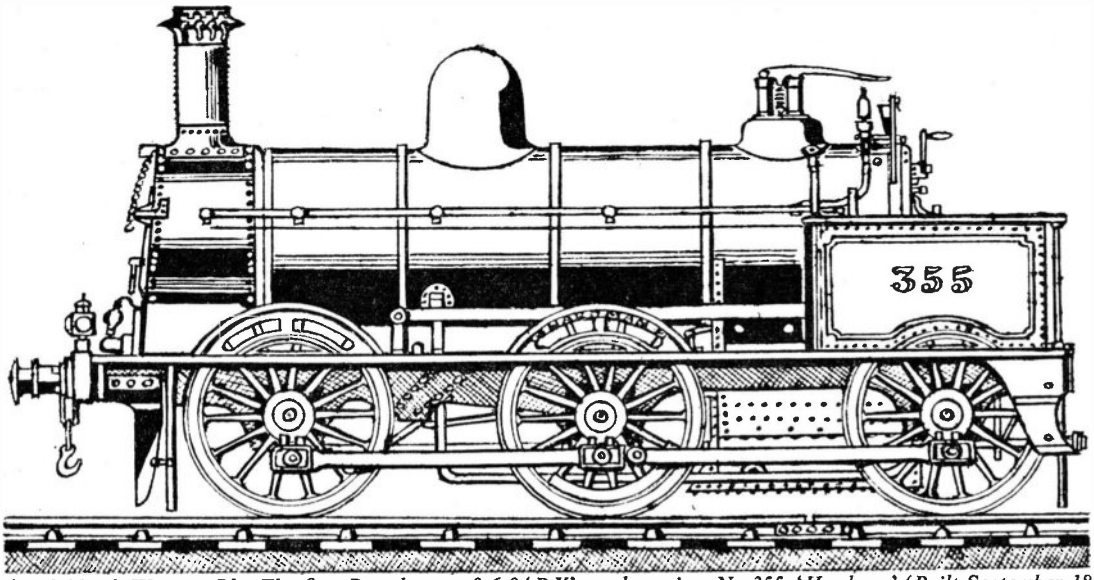
Interesting Locos—78

The Ramsbottom 'DX' Goods Engines



London & North Western Rly. The first Ramsbottom 0-6-0 'DX' goods engine, No 355, 'Hardman' (Built September 1858)

OF the British 0–6–0 Goods tender engines probably the most notable examples were the 'DX' class designed by Mr John Ramsbottom, the Superintendent of Locomotives for the London & North Western Railway. The first engine of the class, No. 355 'Hardman' appeared in September 1858. She was the forerunner of a class of no less than 857 engines for the L. & N.W.R. whilst an additional 86 of the class were built for the Lancashire & Yorkshire Railway at Crewe in 1871–74 making a total of 943 engines, probably the most numerous of any individual class of 0–6–0 engine to be built.

Those for the L. & N.W.R. were built continuously from 1858 to 1872, the first engine *Hardman* being turned out as an experimental type, not at Crewe but at Longsight, Manchester. She was designed and laid down when Mr Ramsbottom was Superintendent there, before moving to Crewe where the succeeding engines were built.

The engines were identical in all respects and presented the first example of standardization and mass production of locomotives on such a large scale. Fifty-four of the first construction were given names, but after a few years these were removed, but were later revived on various classes of L. & N.W. passenger engines, *Hardman* herself, the 399th engine built by the company being revived on No. 758 one of Mr Ramsbottom's 2–4–0 Samson class of 1863, whilst another notable name *Lady of the Lake* No. 494 was revived on Mr Ramsbottom's celebrated 7 ft. 6 in. 'single' No. 531, the exhibition engine of 1862 and again later on *George Whale's* 4–6–0 'Experiment' class passenger No. 1989.

Eighty-eight of the engines survived to become L.M.S. property in 1923. These were numbered in the L.M.S. list 8000–87, the last one being No. 3565 in the L.N.W.R. duplicate list and built in December 1872.

The leading dimensions of the 'DX' Goods were — cylinders 17 in. by 24 in. inclined at 1 in 8. Wheels diameter 5 ft 2 in., wheelbase 7 ft. 3 in. +8 ft. 3 in.= 15 ft. 6 in. The boiler was telescopic with the largest ring at the firebox end and contained 192 tubes of 1⅞ in. diameter. The total heating surface was 1,102 sq. ft., grate area 15 sq. ft. and working pressure 120 lb. per sq. in. The engines were extremely light. The tractive force per pound, M.E.P., was 111·9 and taking 85 per cent of boiler pressure as the mean effective pressure when starting, the total tractive force was 11,410 lb. which gives a factor of adhesion of 5·3.

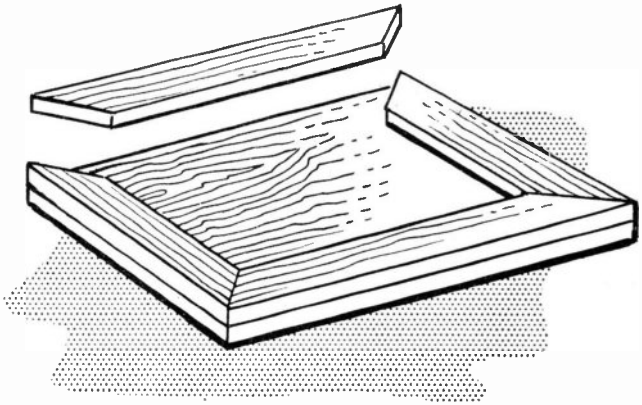
The original weight in working order was 9 tons 14 cwt. on leading wheels, 10 tons 0 cwt. on drawing wheels and 7 tons 6 cwt., on trailing wheels, total 27 tons. The six wheels of course being coupled.

During Mr Ramsbottom's time the engines were not provided with cabs. having only his standard spectacle plate; Cabs were later fitted by Mr Webb who also made various other improvements including the provision of his smokebox and chimney and, in later years, new boilers were provided having the working pressure increased to 150 lb. (Ramsbottom's screw reversing gear was fitted) bringing weight to 31 tons 5 cwt. (A.J.R.)

Interesting Locos No. 77

In describing the G.W.R. 4–6–0 'Castle' class locomotives, it was inadvertently stated that No. 4073 'Caerphilly Castle' was preserved in Swindon Museum. This engine is in fact now in the Science Museum at Kensington, London, S.W.7, where it will be permanently on display to the public. The engine has been restored to its former G.W.R. livery with the number 4073 on the buffer beam, whilst one of the original 3500 gallon tenders as first fitted when the engine was built in 1923 has been provided. It was also stated that all the 'Castle' class had Mr. Collett's 4000 gallon tenders. Recently, however, several of these were replaced by the modernised 4000 gallon tenders designed by Mr. F. W. Hawksworth in 1945 and first fitted to the 4–6–0 '1000' 'County' class built at Swindon in that year.

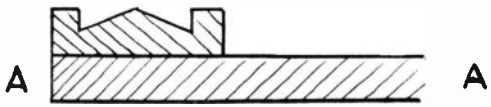
A CARVED PIN TRAY

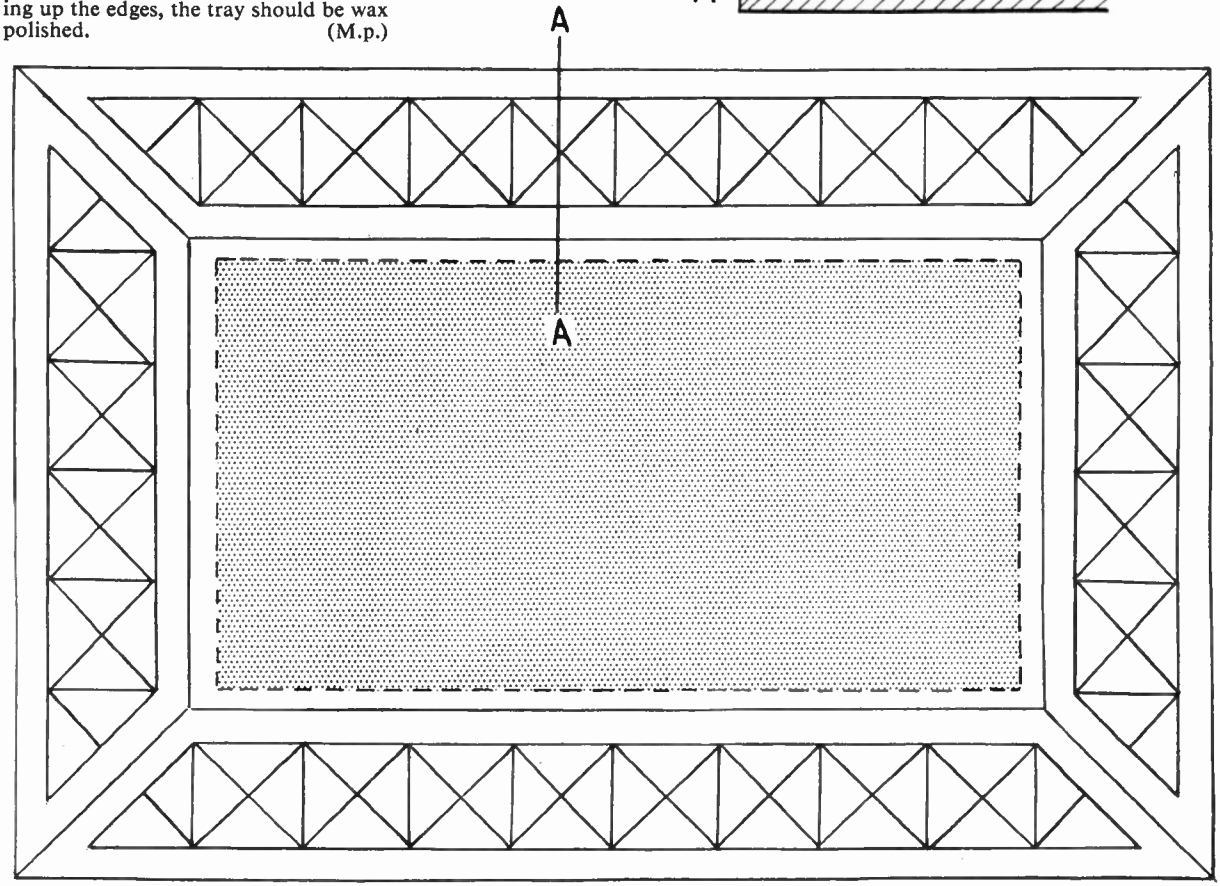


THE tray is first made up as shown in the diagram, cutting the base and the four mitred strips from ¼ in wood. The mitred strips are then marked out as indicated by the full size drawing.

The pattern is carved to the section shown in AA, leaving a series of small pyramids, and the centre of the tray — the shaded area — is matted. A proper matting tool will give the best effect, but a makeshift tool can be made by blunting the end of a 6 in. nail. Just tap the nail all over the surface to leave a series of indentations.

After carving the pattern, and cleaning up the edges, the tray should be wax polished. (M.p.)





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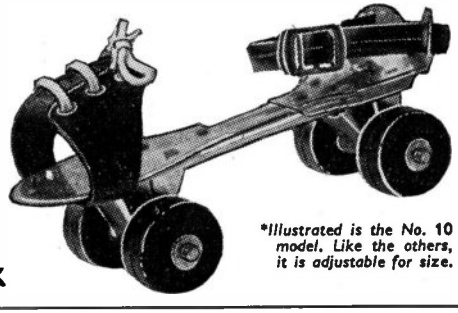

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