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NUMBER 3316

THE ORIGINAL
'DO-IT-YOURSELF'
MAGAZINE

HOBBIES *weekly*

FOR ALL
HOME CRAFTSMEN

Also in this issue :

COMPLETING
THE DINGHY

COLLECTORS' CLUB

MODEL CONTROL
ONE VALVER

A PORTABLE
COAL BIN

MAKE A TOY
'JET' MOTOR

TOY PATTERNS

ETC. ETC.



★ **FREE**
Design
Supplement

**A COLOURFUL
SETTING FOR
SMALL PLANTS
AND CHINA
ORNAMENTS**

WALL BRACKET



Up-to-the-minute ideas

Practical designs

Pleasant and profitable things to make

5^D

POSTCARD collecting is popular in almost every country. American advertising cards are in great demand lately. I have obtained a huge assortment of these cards from pen-friends and a recent parcel contained the following items:

Two theatrical cards depicting scenes from Gene Stratton Porter's play *Freckles*. One shows two scenes on the card divided vertically, the other, a full stage scene, pictures the play at the



height of the climax. Originally, these cards were a folding or double card, the upper card being the advertising half of the unit — the lower, the Mailing Card, with the title, *Freckles*, in large letters.

Two Hupmobile advertising cards, showing the 'Guaranteed for Life' 4 cylinder, 20 horse-power, torpedo model. Seated in the car are two young women, dressed in the fashions of 1911, anticipating a ride in the vehicle. The other vehicle, a 3-passenger coupé, folding third seat, is a pure white job with the usual brass-trim and coach-style parking lights.

And an unusual combination of greeting cards for such festive occasions as St. Patrick's Day, Easter, Mother's and Father's Days and Christmas.

So-called 'art' postcards are enjoying a vogue at present. Among the minor

novelties of an earlier day may be counted the secret-code card. An ingenious conception, it consisted of a numbered card perforated at regular intervals. This was placed over an ordinary post card, and the blank spaces written in, the code

card was then turned, leaving other spaces to be filled in. A post-card written in this manner was practically indecipherable except to the recipient, who has before-hand been supplied with the corresponding key-card.

There was a time when topical cards were in demand — such, for instance, as the Dalton boys' affair. I have seen a card depicting the captured desperadoes laid out on a board platform, each handcuffed, with a gun placed across their still forms.

POSTCARDS FROM AMERICA — By R.L.C.

In a lot of old cards, acquired recently, was found a most unusual Albertype card, showing a happy Mojave Indian family. The squaw, seated nursing her papoose, the Indian brave, long, loose flowing hair and bare-footed, face the camera, very much unconcerned, yet somewhat pleased to pose for the picture.

Readers wishing to open pen friendships with American collectors can write to the following: Fred Gerson, 4055 Stansbury Avenue, Sherman Oaks, California, U.S.A.; Preston D. Orem, 405 Citizens Bank Building, 16 North Marengo Avenue, Pasadena 1, California, U.S.A.; or Raymond Hess, 38526 — 36th Street, East, Palmdale, California, U.S.A.

Pen friend lists are always available on request to the editor — but please enclose 3d. stamp for reply.

Can we help these readers ?

Mr. A. R. Berry of 97 Sketty Road, Enfield, Middx., is in need of *Hobbies Weekly*, dated March 28th, 1956, which contained the wiring diagram for a two-valve radio. Unfortunately this issue is out of print, so we are unable to help.

Mr. A. C. Stokes of 13 Borella Road, West Derby, Liverpool 13, is trying to make models of horse-drawn vehicles, including a bus, and would also like offers of a plan of a motor coach and double-decker bus.

Syed Mohideen, Accountant, Ark Navigation Co. Pak. Ltd., 8 Jinnah Avenue, Dacca-2, East Pakistan, particularly requests help in his search for a copy of the Taj Mahal Design, No. 202 Special.

P. I. Woolley, 16 Bond St., Marton, N.Z. would welcome the designs for H.M.S. Hood (215 Spl.) and H.M.S. Ark Royal (2351/2).

In all cases, readers who can help should write to the individual concerned.

MAKING UP THE WALL BRACKET



DECORATIVE wall brackets are much in demand for displaying cacti, succulents and other small pot plants, and they also make delightful show places for small china and glass ornaments.

Our design shows such a bracket measuring 14½ ins. high and 9½ ins. wide, with provision for two shelves. A colourful picture of a very worried Mexican trying to coax his reluctant mule into activity sets an authentic

scene to the cacti holder. This picture is a Decorette transfer which is applied to ½ in. wood and cut out as an overlay to add to the backboard. When cutting out this scene from Hobbies panel of wood contained in the kit, it should be noted that one or two small wispy pieces of the picture can be ignored, as they would involve too intricate cutting. A study of our finished drawing will give a clear indication of what to leave out in order to get the design cut from the size of panel.

The delicate pattern of the border of the backboard should please those who like intricate cutting, and nicely executed this adds much to the pleasing tone of the bracket.

It will be seen from the design sheet that only half of the backboard is shown, and this section should be traced and repeated in order to obtain the other half. When repeating you will, of course, ensure that the bracket for the bottom shelf is underneath, as shown in our illustration.

The shelves and brackets are shown full size on the design sheet, from which they should be traced and transferred and cut out neatly with a fretsaw. The make-up of the shelf and bracket is also

KIT FOR 9/11

Hobbies Kit No. 3316 contains standard panels of wood, transfer, screw rings, etc., for making this Cacti Wall Bracket. Price 9/11, kits are obtainable from branches or Hobbies Ltd, Dereham, Norfolk (post 1/6 extra)

clearly shown on the design sheet, together with the method of tenoning to the back.

After cleaning up thoroughly with glasspaper, the bracket can be painted or stained and polished as desired. Probably a grey paint background would enhance the colours of the Mexican overlay, which is added to the backboard by gluing.

Small pots and saucers, suitable for planting out cacti and miniature plants, can be obtained from Hobbies Ltd., Dereham, Norfolk, price 6d. a pair, plus postage.

Make a Ratchetless 'Ratchet' Spanner

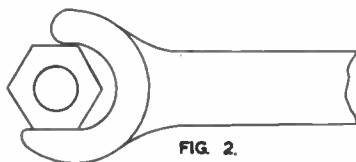
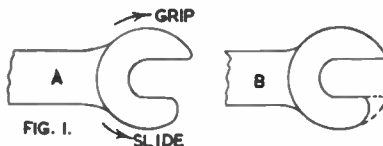
MUCH of the time taken in undoing or doing up a nut is occupied with taking the spanner off and moving it round to the next section of the nut. This is really time and energy wasted and with a long thread can add up to a considerable amount.

The answer to this problem then is to use a ratchet spanner and here is a very simple way to adapt an ordinary tool so that it will act as such but without actually using a ratchet.

On hexagon nuts

It will work quite effectively on any hexagon nut but does not function with a square one, the corners being too sharp to allow the spanner to slide round. The spanner should fit the nut reasonably well, not being too tight nor too loose, and of course this applies to an ordinary type spanner.

Fig. 1A depicts the type of spanner which will work with a ratchet action and it will be seen that the lower jaw has been cut away to give a rounded surface. This can be ground away on an emery wheel or grindstone and the approximate amount to cut off is shown at Fig. 1B.



The exact amount to cut away must be found by experiment and the best way is to make a template before actually grinding the spanner. A piece of thin brass is cut to the same size as the jaws of the spanner and then one jaw is gradually filed off until it will slide over the corner of the nut one way but grip it with the reverse action.

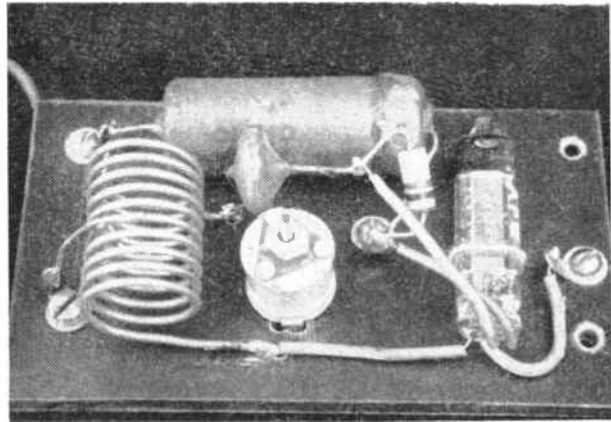
This template will now show the correct position and amount to be ground off the spanner and when doing so keep trying it on the nut as you proceed. It is impossible to replace metal which has been ground away in the wrong place, therefore go slowly.

It does not matter which side of the spanner is ground off because by turning it over the direction of grip is reversed. Once you have got one spanner to work successfully you will know just how much and where to grind other sizes. (A.F.T.)

A ONE-VALVE RECEIVER

A ONE-VALVE receiver can give control up to $\frac{1}{2}$ mile or so, and is thus suitable for most models. It has the advantage of being small, light, easy to construct, and it will run from small batteries. It is also fairly easy to adjust, which is not so with some circuits. Its main disadvantage lies in the fact that the valve required is not available as cheap surplus.

By 'Radio Mech'



The circuit is shown in Fig. 1, and the receiver requires a $1\frac{1}{2}$ V. cell for filament supply, and a 45V. H.T. supply. In small models, the latter is best made up by joining two 22 $\frac{1}{2}$ V. deaf-aid type H.T. batteries in series. The Ever Ready B122 is a suitable type of 22 $\frac{1}{2}$ V. battery. A single cell from a torch battery is satisfactory for L.T. The size is not important, but an extremely small cell, such as one from a pen-torch battery, is best not used, or it will have to be replaced rather frequently. One cell from an Ever Ready 'Baby Torch' (1839) battery will do well. The zinc case is negative. Leads may be joined on with a touch of solder, or clips can be used.

The 30pF condenser tunes the receiver to the same frequency as the transmitter. The receiver is also oscillating at

extremely small — only some 1/10th mA or less. As a result, a very sensitive relay is needed, and adjustment is very critical. For this reason, the specified valve, which is the Hivac XFG1, is recommended. It has wire ends, and does not require a holder.

Other components

The most suitable condenser for tuning is the Philips 30pF beehive air-spaced trimmer. A piece of ebonite or similar rod or tube several inches long should have one end filed to engage with the top of this trimmer, so that it can be

similar gauge) will be needed to wind the coil. The set is constructed upon a flat piece of paxolin approximately 2ins. by 3 $\frac{1}{4}$ ins. Wood is not suitable.

In addition, a 50K (50,000 ohm) variable resistor or potentiometer, with knob, is required. In a small model, this resistor can best be kept separate from the receiver, and can be mounted on a small strip of insulating material which can also hold the on/off switch, which is included in the low tension positive lead.

The layout of parts, and all con-

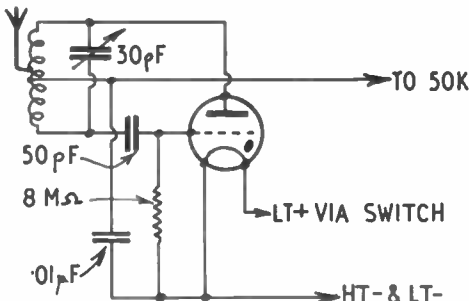


Fig. 1—Receiver circuit

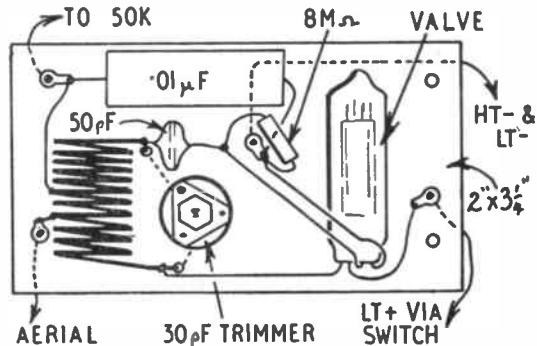


Fig. 2—Wiring diagram of receiver

this frequency, and passes an anode current of about 1 $\frac{1}{2}$ mA. When the transmitter is keyed, its signal is picked up by the receiver aerial. This changes the amplitude of oscillation, and the receiver anode current drops to some $\frac{1}{2}$ mA to $\frac{1}{4}$ mA. This change in anode current works the relay, which in turn switches on current for the magnetic or other steering or control device.

The circuit can be made to work with surplus valves such as the 1S4 or 3S4, but the change in anode current is then

turned without bringing the hand too near the receiver.

The 50pF condenser is a disc or flat mica component. The 8 megohm resistor, or grid leak, can be $\frac{1}{2}$ - or $\frac{1}{4}$ -watt, the $\frac{1}{4}$ -watt being smaller. Values between about 7 and 10 megohms may be used here. The .01μF condenser is an ordinary paper tubular type. A few feet of 16 S.W.G. tinned copper wire (or a

connections, are shown in Fig. 2. The trimmer should be mounted first. To do this, drill a clearance hole for the side and central tags, so that the trimmer fits flat on the Paxolin panel. The side tags are then turned out to hold the trimmer in place.

Four 6 B.A. bolts, with soldering tags, form connecting points for battery and other leads. Holes for these, and

other drilling, should be finished before wiring in the valve.

A wooden rod or any other tubular object $\frac{1}{2}$ in. in diameter will be required to wind the coil. Draw out straight a length of 16 S.W.G. or similar wire, and secure one end to any fixed object. Then wind ten turns on the $\frac{1}{2}$ in. diameter rod, maintaining a good tension on the wire, and keeping turns side by side. Leave a few inches straight each end, for connecting up. The rod is then removed, and the coil pulled out, so that it is about 1 in. long. Bend the ends to pass through small holes near the trimmer, and solder one end to each tag of the trimmer, underneath the panel.

Coil and trimmer connections are also shown in Fig. 3, and this should make wiring perfectly clear. A centre tap is needed on the coil, and is made by soldering a short length of wire to the centre turn. This wire goes to the $0.1\mu\text{F}$ condenser, and 50K variable resistor.

For the aerial connection, a further short wire is soldered on about one turn from the centre tap. This is marked (A) in Fig. 3. The bolt holding the soldering tag provides a connecting point for the aerial. Subsequently, the aerial tapping may be moved a further turn or so away from the centre tap, if a very short aerial is to be used on the model.

The 50pF fixed condenser is soldered to one end of the coil, as shown in Figs. 2 and 3. The anode lead of the valve is soldered to the other end of the coil, as in Fig. 2. This is marked (X) in Fig. 3.

Valve

Two small holes are drilled in the panel, so that a short loop of thin string will hold the valve in place. The valve base is coated with a moisture-repellent, and should not be handled. Valve leads are shown in Fig. 4, the red dot indicating the anode, at the left in Fig. 2. Next comes the filament positive lead, going to L.T. positive (via switch). Grid goes to 50pF condenser and 8 megohm resistor. Filament negative goes to H.T. negative and L.T. negative. Add short lengths of thin sleeving, to ensure that the wires do not touch each other. Do not bend them sharply very near the valve.

Aerial

For testing indoors, no aerial need be used. For short range, 6 ins. or 8 ins. of stiff wire, standing vertically, will do. In the model itself, a longer aerial may be used. A stiff wire, standing vertically from the receiver, can be used, as when testing indoors, or a short rod, fitted to an insulator, and wired to the receiver aerial terminal, may be used. A flexible wire, supported by the mast of the model, is also satisfactory.

The aerial must be well insulated from other parts of the model. With a vertical rod or stiff wire fixed to the receiver, no other insulation will be wanted. But if the wire is not self-supporting in this way, then an insulator must be added at each suspension point.

As changes to the aerial make re-tuning necessary, it is best to adopt one type of aerial, and keep to this, unless it has to be lengthened to improve range, or changed for other reasons.

Tuning adjustments

A meter able to read 0-2mA or thereabouts is required for tuning the receiver. Suitable meters are available at low cost as surplus.

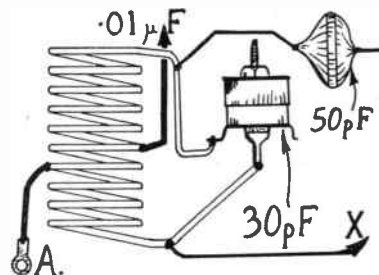


Fig. 3—Coil and trimmer wiring

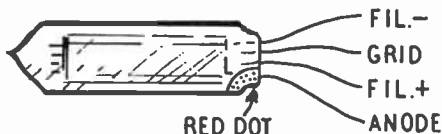


Fig. 4—Valve connections

To adjust tuning, wire 50K potentiometer, relay, and meter all in series, between the receiver and H.T. positive. Set the 50K potentiometer so that most of its resistance is in circuit. The receiver should then be switched on, and the control knob of the 50K potentiometer slowly turned until the meter reads about $1\frac{1}{2}$ mA.

For initial tests, the transmitter may be placed a few feet from the receiver, no aerial being used on the transmitter. The transmitter is then switched on, its key sockets being shorted, or the key closed.

The trimmer on the receiver is then slowly rotated with the insulated tool described until the H.T. circuit meter shows a fall in current. Tune the trimmer for the lowest current reading on the meter, which will be nearly zero.

If the transmitter key is now operated, the H.T. circuit meter at the receiver should rise and fall immediately, in agreement.

If short range working is in view, the 50K potentiometer may be set to a slightly higher value, so that the current, with no signal, is only 1 mA or so. This

will increase the working life of the receiver valve.

In no circumstance must the 50K potentiometer be so set that more than 2 mA passes, or the valve will be damaged. It is better to keep maximum current under $1\frac{1}{2}$ mA or so, and sufficient range should be possible with this.

Do not leave the receiver switched on unnecessarily, or the batteries and valve will need replacing much sooner.

For absolute maximum range, it is necessary to have the aerial tapping fairly near the end of the coil, and to keep up anode current by adjusting the 50K potentiometer, when a working range of up to 1 mile is obtainable. As the distance between transmitter and receiver increases, the change in anode current at the receiver becomes smaller, until it is insufficient to work the relay. All adjustments, such as tuning, also become much more critical.

Relay

A highly sensitive type, intended for model control, must be used. The contacts and armature tension have to be adjusted so that the relay opens and closes with the change in receiver current. At short range, this is very easy. But at long range the adjustments become more and more critical, until it is

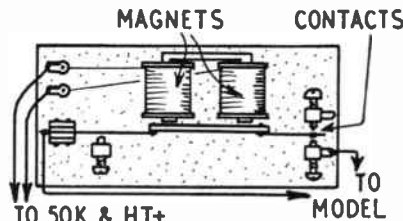


Fig. 5—A dual coil relay

no longer possible to set the relay in such a manner that it works.

Approximate adjustment of the relay is best made, in advance, by wiring relay, 50K potentiometer, and $22\frac{1}{2}$ V. battery in series. Include the meter in one lead, and adjust the potentiometer until the current is around $1\frac{1}{2}$ mA. The tension screw on the relay is then slowly turned until this current just holds the armature down. If current is reduced to about $\frac{1}{2}$ mA, or the circuit broken, the armature should rise.

For most sensitive operation, the armature of the relay must be very near the magnet poles. The return tension of the armature must also be extremely light, and the contact screws so adjusted that the relay armature has a very short movement.

With a given transmitter and receiver, wrong adjustment of the relay can easily cut down the range to one-quarter or less. A little experiment, to see how the

relay works with various currents, is thus worth while.

The relay contacts close when the armature is released, this happening when the transmitter is keyed. A second contact, which closes when the armature is attracted to the magnets, is usually fitted, but is not used.

A relay often used for model control is the Siemens high speed 1,700 plus 1,700 ohm twin coil type. This is light enough to be carried in a model plane if necessary. Surplus relays can be obtained occasionally. Most of these are larger, but some are more sensitive. Suitable relays are always of high resistance (3,000 to 10,000 ohms).

Some relays, such as the Siemens twin coil, have separate tags for each magnet coil. Both coils should be joined in series. One method of connection will give less sensitive working, due to both coil poles having the same magnetic polarity. This can be cured by reversing connections to the tags going to one winding. A test with the meter, in the manner described, will soon show which method of connecting up gives the most sensitive working.

Fitting in the model

A large boat is not needed to carry small equipment of this kind. With the Hobbies pleasure cruiser 'Crusader', for

instance, there is sufficient space for the receiver between formers 6 and 7, with the relay on top of the propulsion battery, between formers 7 and 8. Provided a small clockwork motor is used in the steering actuator, this can go between formers 8 and 9. The electromagnet steering mechanism to be described later requires even less space.

The receiver and other small batteries should be kept low in the hull. The actual weight of all the equipment is quite small, and can easily be carried.

Other items

Later articles dealing with the receiving and steering units will be as follows:

Steering and control actuator, for steering, stopping or reversing the boat.

Pulse and space control, requiring the minimum of light equipment in the boat.

Controlling model vehicles and aircraft.

Further notes on working, and valveless receivers, etc.

Though the various items are designed to work together, they will also operate with commercially-made equipment of the continuous wave type. It is possible to purchase ready-made transmitters, receivers, actuators, and other items,

though the cost would then be much increased.

Transmitter and receiver parts

Many of the items are ordinary radio components, and can be bought from component shops, or from postal suppliers such as Coventry Radio, 189 Dunstable Rd., Luton, Beds. The Hivac valve may be obtained through shops, or from the maker, Hivac Ltd., Stonefield Way, South Ruislip, Middlesex. Cheap valves for a transmitter may be bought from Alpha Radio Supply Co., 103 Leeds Terrace, Wintoun Street, Leeds 7. Various items suitable for radio control purposes can be obtained from Arthur Sallis Radio Control Ltd., 93 North Road, Brighton. An address from which the Siemens high speed relay may be purchased is Dependable Radio Supplies Ltd., 12a Tottenham St., London W.1.

As the prices of components may fluctuate, it is not possible to give them here. An exact idea of the cost of building any of the items described can be obtained by referring to the price lists of the suppliers.

Next week 'Radio Mech' will deal with the steering and control actuator.

BRASS RUBBINGS

WHAT do you know about brass rubbings? If you approached ten men in the street and asked each one that question, the answer, in nine cases out of ten would be: 'Nothing at all!'

In a country as rich in the relics of history and heraldry as England, it is surprising that the hobby of making brass rubbings is not more popular.

The earliest memorial brass plate, laid in 1277, is to be found at Stoke Dabernon in Surrey, but there are 4,000 others scattered around English churches up and down the country. In comparison, the whole continent of Europe boasts only a few hundred.

Taking brass rubbings, or collecting impressions of these brasses is a hobby which can be both informative and absorbing if tackled with enthusiasm.

The materials required are simple, but the first and most important essential is to obtain the vicar's permission. In most cases this will be readily given, although I have known brass rubbers to be treated

with deep suspicion by the occasional clergyman.

Having obtained the necessary consent, you should take a sheet of paper of a size suitable for the brass you intend to rub, a duster, a small wire brush, a pencil, and a piece of charcoal.

Great care should be taken in selecting the paper, for it is the quality of it that determines the quality of the finished article. If the paper is too thin it may tear when you begin to rub: if it is too thick it will not be possible to obtain a satisfactory impression of the brass, and the reproduction will be indistinct. The paper must be sufficiently pliable to give a clear imprint of the markings in the brass and yet strong enough to stand the wear and tear involved.

You will soon discover by experience what type and quality paper is best suited to the job. Many people find that white ceiling paper fits the bill very well.

Having selected the brass, clean it thoroughly with the wire brush and duster. It is most important to get all the

dirt out from the lines of the brass, or else the result will be blotchy and uneven. Next lay the paper over the brass and keep it there in position throughout the operation. Here again individual experience and ingenuity should be brought into play since brasses often seem to be situated in the most awkward corners. If there is enough room, allow the paper to extend beyond the brass itself and secure it with any fairly heavy object, e.g., hymn books or hassocks. And unless you want to arouse the wrath of the vicar and church-wardens, remember to replace them afterwards!

The next stage is to outline the actual brass with the pencil on the paper, so that you know which part of the paper to rub, and rubbing can then begin.

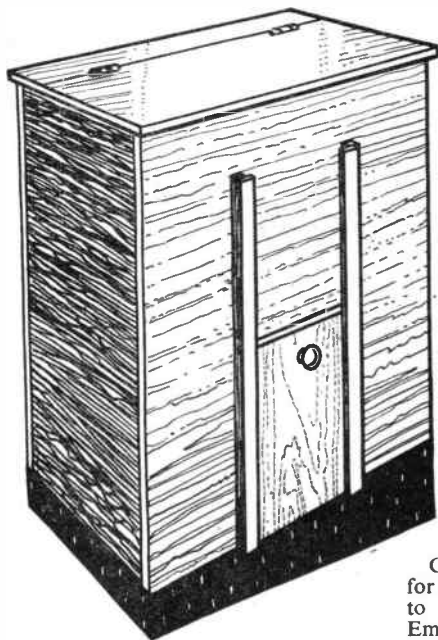
Move the charcoal regularly and firmly across the paper and continue to do so until you have a clear imprint of the brass. Remember, too, that it improves the appearance of your work and gives the impression greater definition if you ink in some or all of the lines, when completed. Finally, before you leave the church, record its name and the name of the person commemorated, together with the date of the brass.

It is usual to keep rubbings rolled up, but a friend of mine while at college used to hang them around the walls of his room. (L.G.)

A PORTABLE COAL BIN

*Especially useful
for people living
in flats*

By *W. J.
Ellson*



FOR indoors or outside, the coal bin illustrated will prove a most useful article. For those with small coal cupboards or for many living in rooms, with no cupboards or cellars at all, a portable fuel bin is a necessity and its portability enables its owner to move it to other premises without trouble.

Fig. 1 shows the sides and ends, the dimensions given being suggested for indoor use, being small enough to fit in a corner of the room, or preferably, the landing. (A) in the diagram, (Fig. 2), shows the corner joints with $\frac{3}{4}$ in. by $1\frac{1}{2}$ in. timber as the posts. One strip of this material is nailed to the boards of the ends and one to back and front parts, all being securely held together with 3 in. steel bolts.

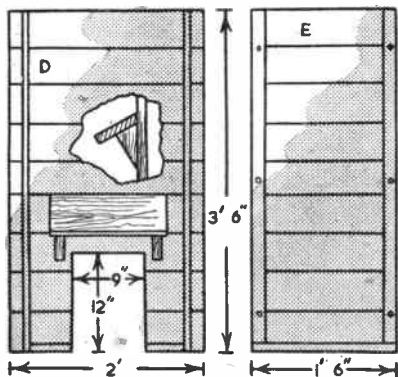


Fig. 1

Cut the boards to the required lengths for sides, back, and front parts, necessary to make up the height of 3ft. 6ins. Employ tongued and grooved boards, $5\frac{1}{2}$ ins. wide and $\frac{5}{8}$ in. thick. These are kept together with the corner jointing strips, the positions of which are shown in Fig. 1, (D) being front, or back parts, and (E) the ends of the bin. In the front and back parts, the strips are spaced $1\frac{1}{8}$ ins. from the side edges. To support the floor, 1in. sq. fillets are nailed across at the bottom of all parts.

Making the doorway

In the front part only a doorway is sawn out as shown but before sawing this out, on the outside nail 3ft. lengths of $\frac{3}{4}$ in. by 1in. wood vertically for the door to fit between, positioning these $\frac{3}{4}$ in. away from the doorway each side.

Cut the door itself from $\frac{3}{4}$ in. plywood. To keep it in place cover the side strips with $\frac{1}{2}$ in. by $1\frac{1}{2}$ in. wood, thus making a grooved runway for the door to slide up and down in. To the door fit a small metal knob. Above details are shown at (C), Fig. 2.

Now fit all four parts together, and through the end parts bore $\frac{1}{4}$ in. holes for the bolts which will hold the bin together. The lid is made up of boarding similar to that used for the bin. Screw 1in. by 2in. battens underneath. A strip of the

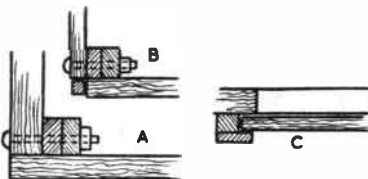


Fig. 2

CUTTING LIST

Floor, lid, sides, front and back.	90ft. run of $\frac{5}{8}$ in. by $5\frac{1}{2}$ in. Tongued and Grooved boards.
Vertical corner posts	30ft. run $\frac{3}{4}$ in. by $1\frac{1}{2}$ in. wood.
Floor fillets	8ft. 1in. sq. wood.
Roof batten	3ft. 1in. by 2in. wood.
Door.	$\frac{3}{4}$ in. ply panel. 13ins. by 10ins.
Guides for same.	6ft. $\frac{1}{2}$ in. by 1in. and 6ft. of $\frac{1}{2}$ in. by $1\frac{1}{2}$ in.
One metal knob and one pair 3in. steel butt hinges.	

boarding, 4ins. wide, is cut separately, and screwed to the rear portion of the top of the bin, to which the lid is to be hinged. Use brass screws, as these will not rust and can, when necessary, be easily withdrawn when the bin is to be taken apart.

Boarding for the floor is then put together with battens beneath to hold all securely. It should be cut to the interior dimensions of the bin, and should have notches sawn out at the corners to drop over the posts and rest upon the fillets at the bottom.

One addition to the bin is recommended, to prevent coal falling out when the door is lifted. It is shown at (D), and details of it are given in the inset diagram. It is simply a 5in. wide piece of the boarding supported at a downward angle by side brackets.

If the bin is for indoor use, a neat effect can be obtained by hiding the cross grained ends of the boarding by fixing the corner post strips of the front and back parts of the bin $\frac{3}{4}$ in. from the side edges, instead of $1\frac{1}{8}$ ins. This will leave a rightangled gap at the corners, which can be filled up with square section vertical strips making a neat finish, as shown (B), in Fig. 2.

The completed bin can be painted or stained but the actual finish is a matter of personal choice.

Among the projects to be described next week are a Writing Desk and Drip Drier. Also woodwork patterns, modelling notes, Collectors' Club, etc. Make sure of your copy.

From last week

COMPLETING THE DINGHY

AFTER the framework is assembled, all of the outer surfaces have to be 'faired off' to present an even surface to the plywood. Some of the beveling may be done more easily before assembly, and these angles are given on the plan. The hog (A) is shaped and bevelled and fitted next. The gunwales (B) do not need any beveling. At the stem a gunwale is bevelled to fit against the post (Fig. 3), where it is glued and screwed. It is then bent through the slots in the frames and cut to fit in the slot at the transom. The two chines (C) and (D) have to be bevelled and fitted in the same way (Fig. 4). Keep in mind that the surfaces have to be faired off later — it is easier to rub down the edge of a frame than the longer length of a lengthwise part, so it pays to notch a little on the deep side (Fig. 5). The two risers (F) may be fitted now. There is no need for steaming in any of the construction.

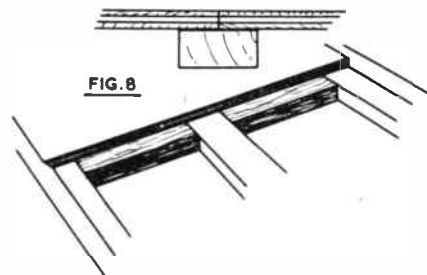
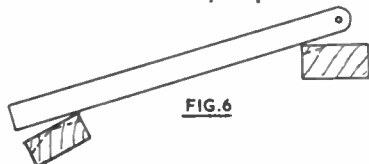
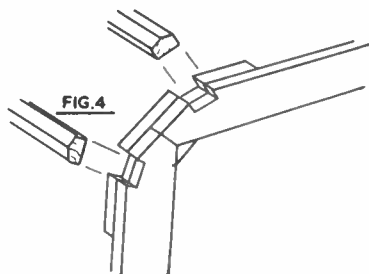
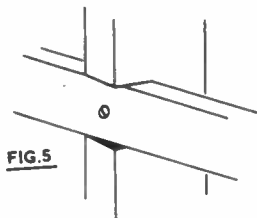
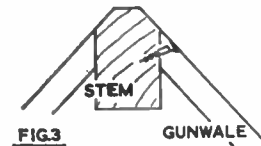
At this stage the framework is ready for preparing the skin. Use a straight strip of wood or long rule and lay it across the surfaces in the way the plywood will go. Use a plane or a Surform tool to work down any high spots (Fig. 6). Be patient over this — the ease of fitting a satisfactory skin depends on the thoroughness of fairing off. Towards the ends the plywood will curve slightly, but in most places you can assume it will be flat.



The best way to transport the dinghy is on a light trailer. It may be towed without effort by the smallest car.

Standard marine grade plywood (marked 'BSS 1088') is made in sheets 8ft. by 4ft., so there will have to be joints in the length. The bottom is made with panels as long as possible from the

transom and short pieces added forward. For economical cutting it is a good plan to make stout paper templates for each part. The two large bottom panels have straight edges meeting at the centre line of the hog. Their outer edges should come to the centre line of the chine. They can be marked



along the inner edge of the chine and $\frac{3}{4}$ in. added (Fig. 7). Allow a little waste when cutting.

Put the plywood in position and mark the outlines of all parts of the framework on it. Remove and drill for screws about 4ins. apart around the edges and about 7ins. apart where the plywood comes over frames or stiffeners. Put glue on the framework and hardener.

on the plywood. Bring the parts together and hold with weights or cramps while you put screws in at a few key points, then screw through all the holes. Fixing the first panel may take some time, but you will soon master the technique. The first two panels are the biggest, and it is a help to have an assistant.

The joint at the forward edge is made with butt straps — pieces between the other parts, glued and screwed on (Fig. 8). The forward triangular pieces have to be given a twist. Cut a piece from a paper template, with a little surplus left at the forward end. Mark, drill and glue it, then fix it first to the butt straps. Progress from there screwing to the frame, chine and hog as you work forward. Pull the plywood to shape and hold it to the chine with cramps, while you complete screwing. This should go easily, but if the plywood is stubborn,



The boat nearing completion.

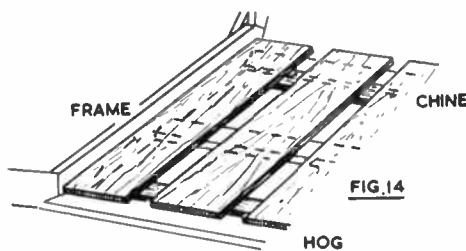
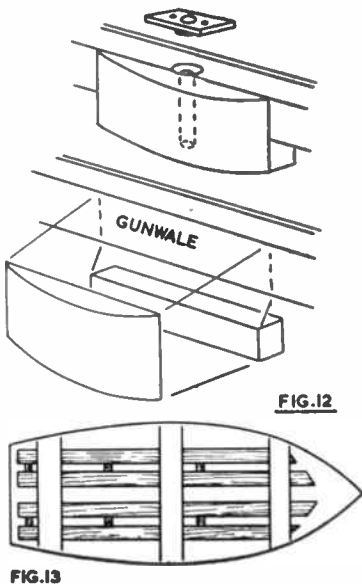
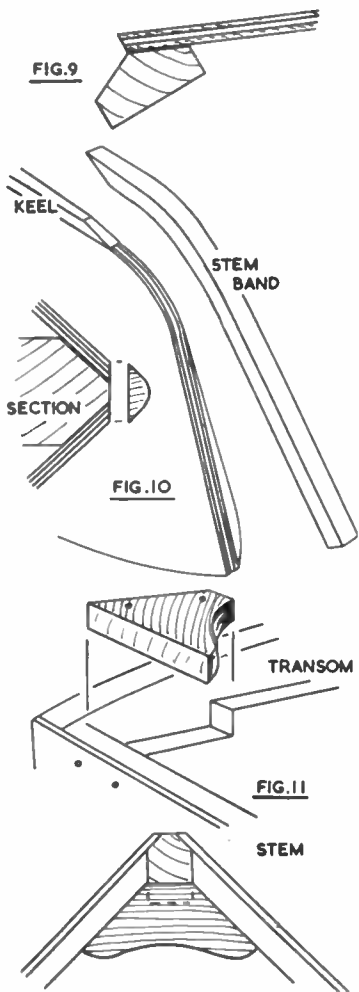
Thwarts, rowlock swells and centre-board casing have been fitted. The gunwale rubbing strips and the bottom boards will be made next.

soak a cloth in hot water, and put it over the plywood for a few minutes.

Prepare the plywood to meet the next sheets by planing with a rebate plane. The line along the hog is not so important, as it will be covered by the keel, but try to make a mitre at the chine (Fig. 9). The chine strips are best made so that they join on frame 2, avoiding the need for a butt strap. Cut a piece approximately to size, then plane its edge to match the bottom plywood. When this makes a reasonable fit, mark and cut the outline of the other edge, then proceed to fit the panel in the same way as the bottom. Follow on with the other chine strips, then the side panels.

Full-size plans available
Complete plans for building the Wensum Sailing Dinghy are available from Hobbies Ltd., Dereham, Norfolk, price 16s. 0d., plus 9d. postage. The plans include all the information needed to build the boat — full-size drawings of the frames and other shaped parts, several other detail drawings, a material schedule and step-by-step instructions — for rowing, out-board motor and sailing.

These are best made with long panels aft and butt straps just aft of frame 1. Plane the plywood edges level at transom and stem. Along the centre, plane down the plywood to form a surface for the keel. Make the keel (G), which is a flat strip tapered in its width, and glue and screw it on. If the boat is to be sailed, keep the screws away from where the



centre board slot will come. Forward, the keel is bevelled and a thin ash strip continues around the stem (Fig. 10).

This is the stage where you can unscrew the boat from the floor and turn it over. Before you cut off the projecting pieces, fix a temporary strip across the gunwales near the centre of the boat.

This may be screwed or cramped on. Its purpose is to prevent the hull distorting when the cross members of the frames have gone. You will now appreciate the appearance of your boat, but do not be misled into thinking that it is nearly finished. If you are to make a good job of it, the boat itself is now barely half finished, although the other work tends to seem more like finishing touches.

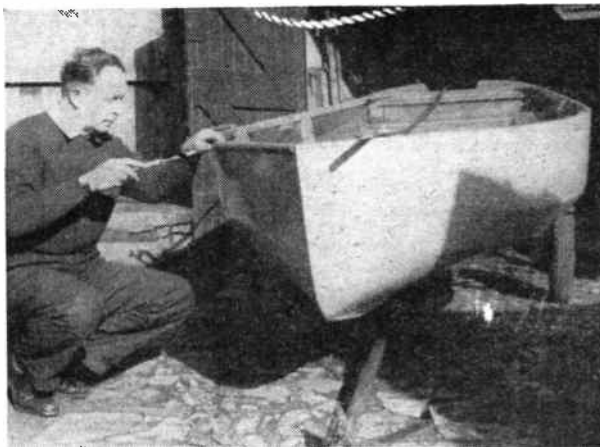
Plane down the plywood level with the gunwales. Make and fit the knees at the corners. These are wooden brackets which serve as stiffeners (Fig. 11). If the boat is not to be equipped for sailing the three thwarts (J, K and L) may be made and screwed to the risers, then the temporary strip across the gunwales removed. It must stay in position until the main thwart (J) is fitted.

For rowing there must be rowlock swells fitted to the gunwales to take the rowlock plates (Fig. 12). The best position is with the rowlock 12ins. aft of the edge of the thwart.

The outside edge of the gunwale is protected by a strip of half-round moulding (I) screwed on. There are some rubber mouldings which are also suitable, but more expensive.

In racing boats bottom boards are sometimes dispensed with, but it is wisest to fit them to spread the load of the crew and avoid local strains on the skin. The simplest bottom boards for this boat consist of strips laid length-

Fixing the rubbing strips to the gunwale. Notice the plywood skin blends to a smooth surface near the stem and the lines of the chines disappear.



wise over the frames (Fig. 13), but it is neater to make sections to fit between the frames (Fig. 14).

This completes the construction of a rowing boat, except that rubbing strips (H) are worth having to protect the bottom if it has to be dragged. The whole boat could be varnished, but the usual finish is to paint outside, except for the transom, which is varnished. The inside is also varnished, although the bottom boards and the part of the hull below them could be painted.

If the boat is to have a good finish, some time must be spent removing surplus glue, filling hollows over screw heads with stopping or plastic wood, and generally sanding smooth. Three coats of marine varnish will be needed. For painting, start with a primer and follow with undercoat and top coat, preferably of a marine grade.

Many people will want to go the whole way and complete Wenum as a sailing boat, and the next article describes the additional work necessary.

A PAPER SAILING BOAT

ONE of the simplest and most popular of the classic paper folds is the sailing boat, made from a rectangular sheet of white notepaper (Fig. 1).

Fold the paper in half, so that corners (A) and (B) come flush with corners (C) and (D) (Fig. 2). Also fold this shape in half crossways, but this time merely press in the fold and open the shape again (Fig. 3).

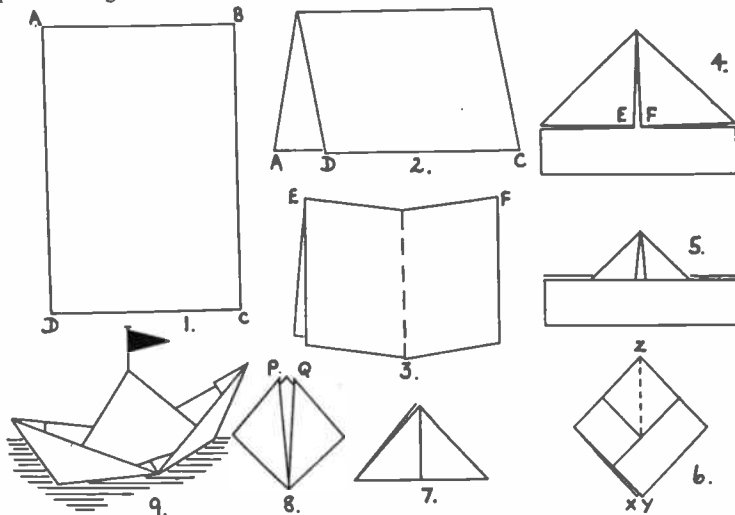
Bend over points (E) and (F) to touch the folded mid-line, and press down the two folded edges to make a perfect point at the top of the shape (Fig. 4). Bend up the two long flaps flush with the base of the triangle on either side of the shape (Fig. 5). You will now have a paper object which, if made from a page of newspaper and decorated with a plume of coloured streamers, would serve as a toy tricorne hat. But continue to make the sailing boat as follows.

Open the hat shape by first inserting your fingers in the hollow space. Then press the shape flat to form Fig. 6.

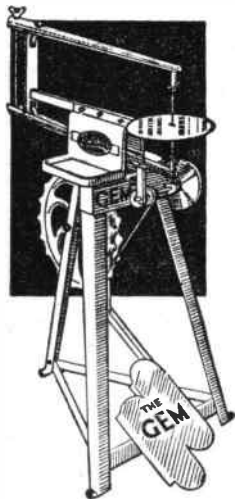
Bend upwards the triangular flaps at the front and back, so that points (X) and (Y) are flush with point (Z), to make Fig. 7.

Insert your fingers in the hollow space of the triangular shape, and open it out and press flat to form Fig. 8. Pull gently outwards at points (P) and (Q) to complete the sturdy model sailing boat depicted in Fig. 9.

You can write a name on the bows of the boat and attach a paper pennant to the top of the sail by means of a pin. The sailing boat can be floated in a bowl of water or a pond. Boys like to float paper boats in flowing streams, and then try to sink them with pebbles. (A.E.W.)

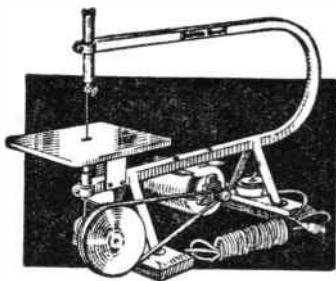


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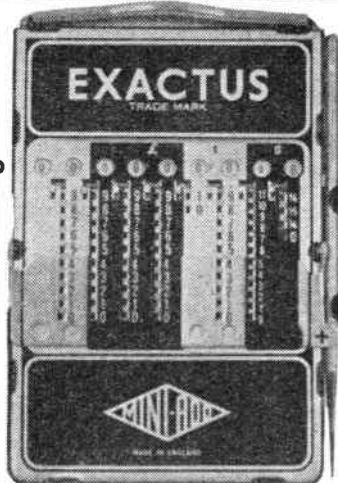
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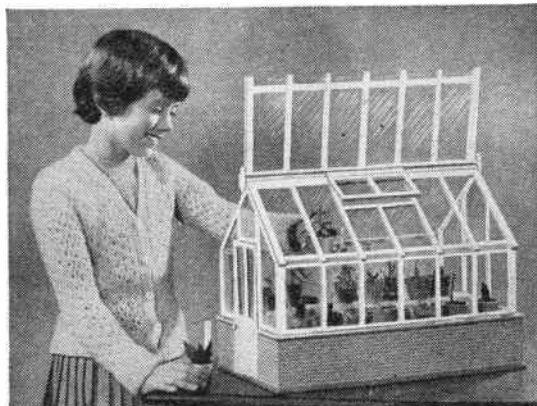
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MAKE A FOLDING STOOL

Described by
Finlay Kerr

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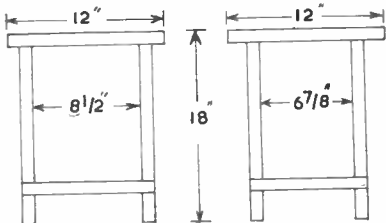


Fig. 1

The best timber to use is a hardwood such as oak or beech, but a good softwood may be used if desired. The legs and top rails are made from 1 1/2 in. by 1/2 in. timber planed smooth on all four sides. Cut the four legs each 18 ins. long and the two top rails 12 ins. long. The legs are then morticed into the top rails as shown in Fig. 2. In order that one frame may fit inside the other the legs

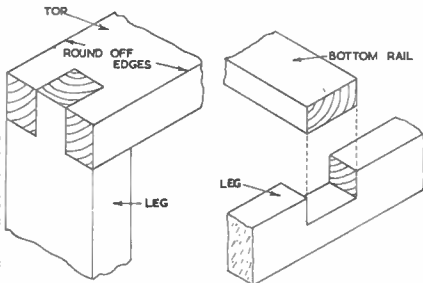
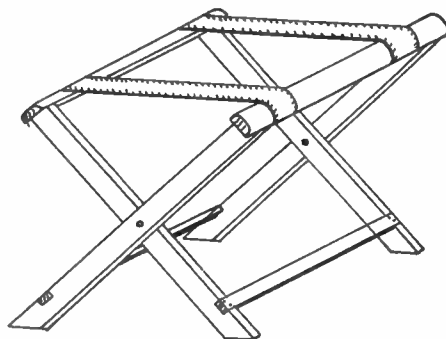


Fig. 2

Fig. 3

are spaced apart differently in the manner shown in Fig. 1.

The bottom rails are made from 1 1/2 in. by 1/2 in. planed timber and these are housed into the legs as shown in Fig. 3. These bottom rails are necessary to keep the legs properly spaced apart. Once the legs and rails have been prepared and the joints accurately formed, assemble them to make the two frames.



The next step is to round off the sharp edges of the top rails slightly so that they won't damage the material used for the seat, as shown in Fig. 2. After this, secure the two frames together with two 3/8 in. diameter bolts through the centre of the legs. Each pair of legs should be separated with a thin washer to prevent unnecessary friction when opening and closing the stool. Remember to place the nuts on the inside of the stool.

Before fixing on the seat material it is advisable to tack two strips of strong canvas across the top as shown above, to hold the stool in the desired open position. Use large headed tacks for this purpose. When this is done, saw off the bottom parts of the legs so that they fit accurately to the ground when the stool is in use.

The final task is to nail on a piece of hard wearing material for the seat and then give the timber parts of the stool a coat of good preservative paint.

Making a Lock safer

'ONE key will undo many locks!' This is a rather startling statement, but, nevertheless, only too true. Many of the cheap locks, such as we have on a shed, are identical, and just one key will open the lot. Quite a few better class ones, too, are prone to the same fault, and there are cases of neighbours borrowing each other's front door key when one has been mislaid.

However much we may trust our friends, this is not a healthy state of affairs, and burglars, too, are very much aware of this fault, and seize on every opportunity to make full use of it to their advantage.

It is a very easy matter to make your house more secure, and any lock that is fitted with a guide pin for the key to slide on can be adapted without impairing the action of the lock in any way. It does, however, prevent anyone having a similar key from inserting it in your lock

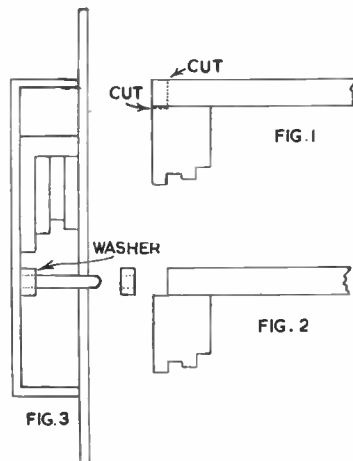
and gaining entry to your property.

What you have to do then is to make your lock so that only your key will fit into it. This is done by cutting off a small section of the end of the tube of the key, as shown by the dotted lines in Fig. 1, with either a very fine hack saw or a metal fretsaw. You do not want to cut too much metal away, therefore, the narrower the cut the better.

Fig. 2 shows the finished key, together with the small 'washer' which has been cut off. This must now be closed slightly, so that it is a tight fit on the guide pin; and the key can be used to push it home (Fig. 3). The best way to close the washer to the required amount is to squeeze it up in the vice, but be careful not to crack it.

It is now impossible to push a key right into the lock unless it has the required amount cut off the pipe, and this can be varied within certain limits.

Do not, however, cut more than half the width of the lever, otherwise the key will be seriously weakened, and if the lock is at all stiff, it may even break off. (A.F.T.)



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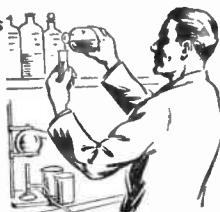
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GLASS REACTION MOTOR

THE principle of jet propulsion was known to the Greek scientist Hero over 2,000 years ago. For centuries his steam-driven 'Ball of the Winds' was regarded as little more than a scientific curiosity, and yet it was to become regarded as history's first recorded hint of our twentieth-century jet age.

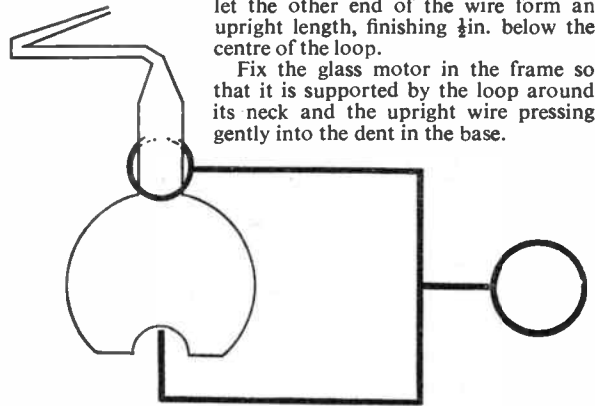
Hero's ingenious engine has inspired a little glass toy which could at one time be bought from street pedlars for a few pence. You can make such a toy if you possess a little skill in glass blowing and manipulation.

File a nick across a piece of $\frac{1}{4}$ in. diameter glass tubing, about 5ins. from the end. Break off the short tube by bending and pulling slightly. The break should be perfect.

Set a steel knitting needle upright in a vice near a hot bunsen flame. Heat one end of the tubing until the glass is red hot and forms a soft blob, then blow a neat bulb $\frac{2}{3}$ of an inch in diameter. As you do so press the base of the bulb against the point of the knitting needle. You must obtain a firm, regular bubble with a good dent opposite the straight tube.

When the glass is cool, heat the tube as near to the bulb as is comfortable, in the top of the bunsen flame. Twist the glass between the fingers of both hands while this is being done in order to make sure that the part of the tube held in the flame is heated evenly. Wait until the glass is glowing red hot before you pull it out to form a narrow neck about

This novel toy will provide lots of fun



let the other end of the wire form an upright length, finishing $\frac{1}{2}$ in. below the centre of the loop.

Fix the glass motor in the frame so that it is supported by the loop around its neck and the upright wire pressing gently into the dent in the base.

$\frac{1}{10}$ th inch in diameter. As you stretch the glass let it bend through 90° near the constriction above the bulb.

Heat the narrow side tube about $1\frac{1}{2}$ ins. from the bulb and bend it through 90° to point backwards in the same plane. Carefully file the thin tube $\frac{1}{8}$ in. from the second bend and break off. Finish by heating the broken end of the apparatus just sufficiently to round off the sharp edge. Take care not to seal the tube.

The toy jet motor is now complete and must be mounted in a little frame formed from stout wire. Make a loop in one end of the wire, to fit loosely over the wide part of the tube, above the bulb. Bend around the wire to form a handle and

Make a spirit burner by soaking a wad of cotton wool in methylated spirit and placing the pad upon a tin lid.

Ignite the burner and warm the glass bulb in the flame. This will cause the air in the bulb to expand. Dip the jet tube in a dish of water and let the water enter the bulb as the air inside cools and contracts. When the bulb is half filled with water the motor will be ready for action.

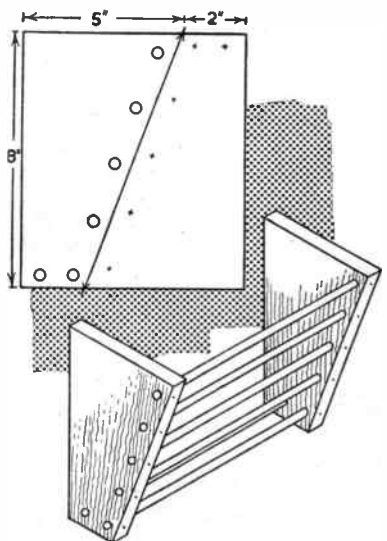
Hold the toy over the flame and let the water boil. The reaction to the jet of steam as it issues from the narrow tube will cause the motor to rotate with considerable speed and a great deal of furious hissing. (A.E.W.)



A piece of softwood is required 8ins. by 7ins. by $\frac{3}{4}$ in. or $\frac{1}{2}$ in. This is divided into two as shown by the arrowed line in the diagram. Six $\frac{3}{4}$ in. holes are then bored in each piece in centres $\frac{1}{2}$ in. from the edge in the approximate positions shown. Six 10in. lengths of $\frac{3}{4}$ in. dowel are then cut off and placed in the holes. A 1in. panel pin should be tapped through each dowel from the front edge.

Remove any sharp corners with glass-paper to avoid injury to the animals and then screw in position. This is best done by starting two screws in the back edges of the uprights, then, measuring the distance between these centres very carefully, bore a pair of corresponding holes through the outside of the hutch. Take out the two screws and refix from the outside of the hutch.

Fill the rack with hay and your pets will never be cold or hungry. (K.J.)



THROUGHOUT the year, and particularly in winter, rabbits and guinea-pigs need constant access to hay for eating and bedding. This hayrack can be made in half an hour and will keep the hutch tidy.

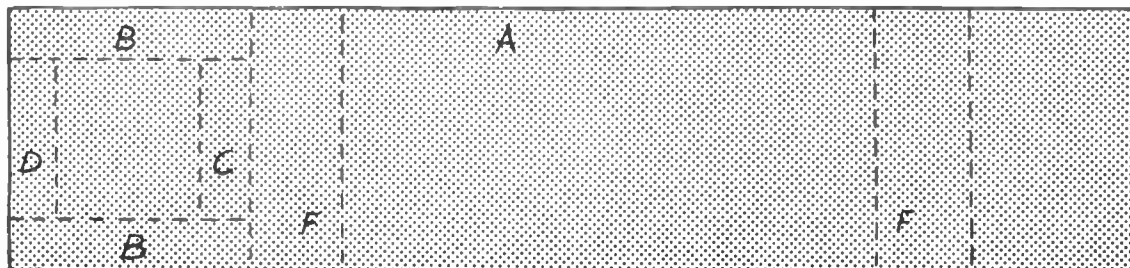
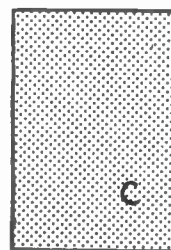
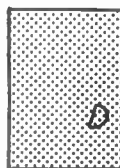
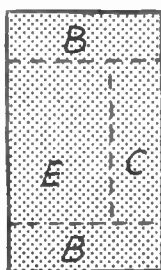
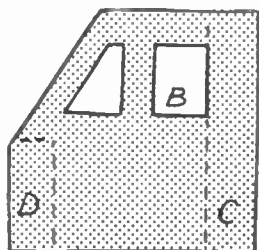
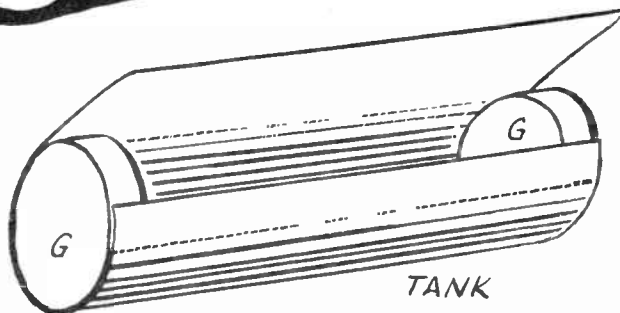
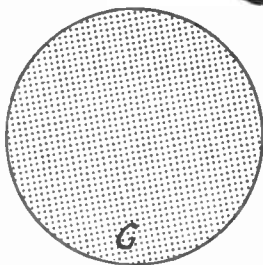
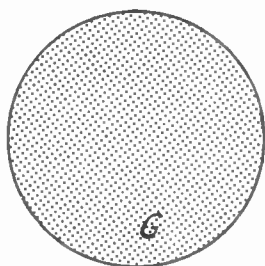
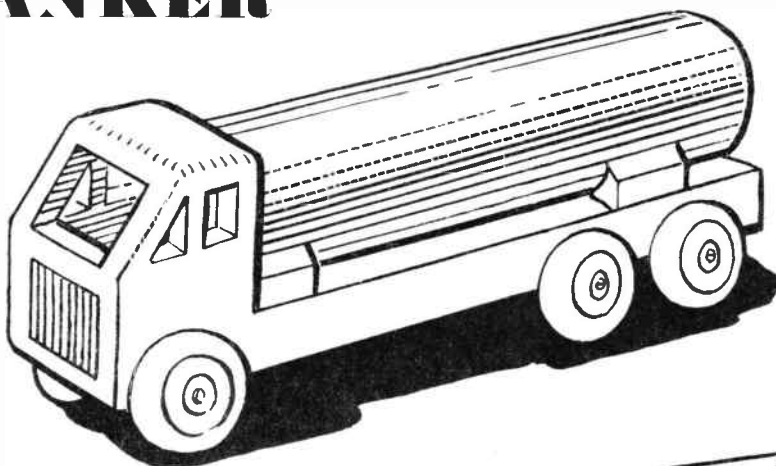
The rabbit or guinea-pig can nibble the hay through the bars whilst at the same time any dirt or chaff contained in the hay drops out through the bars on to the floor of the hutch and is removed when the hutch is cleaned.

Full-size toy patterns

PETROL TANKER

CUT piece (A) from $\frac{1}{2}$ in. wood and to this glue pieces (F), also $\frac{1}{2}$ in., in the positions shown by the dotted lines. Cut two of (B), one of (C) and one of (D) from $\frac{1}{2}$ in. wood and glue them to (A). Glue piece (E), of $\frac{1}{2}$ in. wood, on top of (B), (C) and (D) to form the cabin roof.

Make up the tank from two pieces (G) of $\frac{1}{2}$ in. wood and a piece of thin card. Glue to pieces (F). Finally paint in bright colours and add six $\frac{1}{8}$ in. plastic wheels, which can be obtained from Hobbies Ltd., Dereham, Norfolk, price 8d. per pair, postage 3d. (M.p.)



TWO SUPERB DESIGNS

For those who want
'something different'

The Swiss Church (right) and Willow Pattern Box (below) are two fine examples of exclusive designs introduced by Hobbies Ltd. They are intended for the worker who requires something more than just a plain 'musical box'.

Authentic in design and detail, the finished models provide ample reward for the care taken in execution, and can be put to a real practical use, such as for holding cigarettes or trinkets.

A list of tunes available which can be incorporated into these designs is given below. Kits and musical movements, which are sold separately, can be obtained from any Hobbies branch or stockist, or by post.



WILLOW PATTERN BOX
Design No. 3284

Scenes from the famous story in fine detail. Music plays when pagoda lid is raised. Kit of wood and materials for making box **9/3**
(post 1/6 extra)

Fit with a movement from adjoining list



SWISS CHURCH
Design No. 256 Spl.

Windows light up and music plays when the roof is raised. Kit of all materials and fitting s,paint, glue, etc. (post 1/9 extra) **25/-**

Base 9ins. x 6 1/2 ins.
12 1/2 ins. high

MUSICAL MOVEMENTS

15 6 extra (see below)

CHOOSE FROM THESE TUNES

(A) Auld Lang Syne, (B) Limelight, (C) Swedish Rhapsody, (D) Silent Night, (E) Brahms' Lullaby, (F) Harry Lime Theme, (G) Blue Danube, (H) Parade of the Wooden Soldiers, (J) Bells of St. Mary's, (K) Moulin Rouge, (L) Vienna, City of My Dreams, (M) Jingle Bells, (N) Home Sweet Home, (O) Auf Wiedersehn, (P) Green-sleeves, (Q) O My Papa, (V) Merry Widow, (W) Tales from the Vienna Woods, (X) Irish Eyes are Smiling, (Z) Gounod's Ave Maria, or (I) Church Bells Air (specially for Swiss Church).
Each movement 15/6 (post 6d.).

Ask for details of other musical kits.

To Hobbies Ltd., Dept. 99, Dereham, Norfolk

Please send details of other Musical Box kits and items ticked.

- Swiss Church Kit 256 Spl. 25/- (post 1/9)
- Willow Pattern Box Kit 3284. 9/3 (post 1/6)
- Musical Movement (A, B, C, etc) 15/6 (post 6d.)

Name

Address

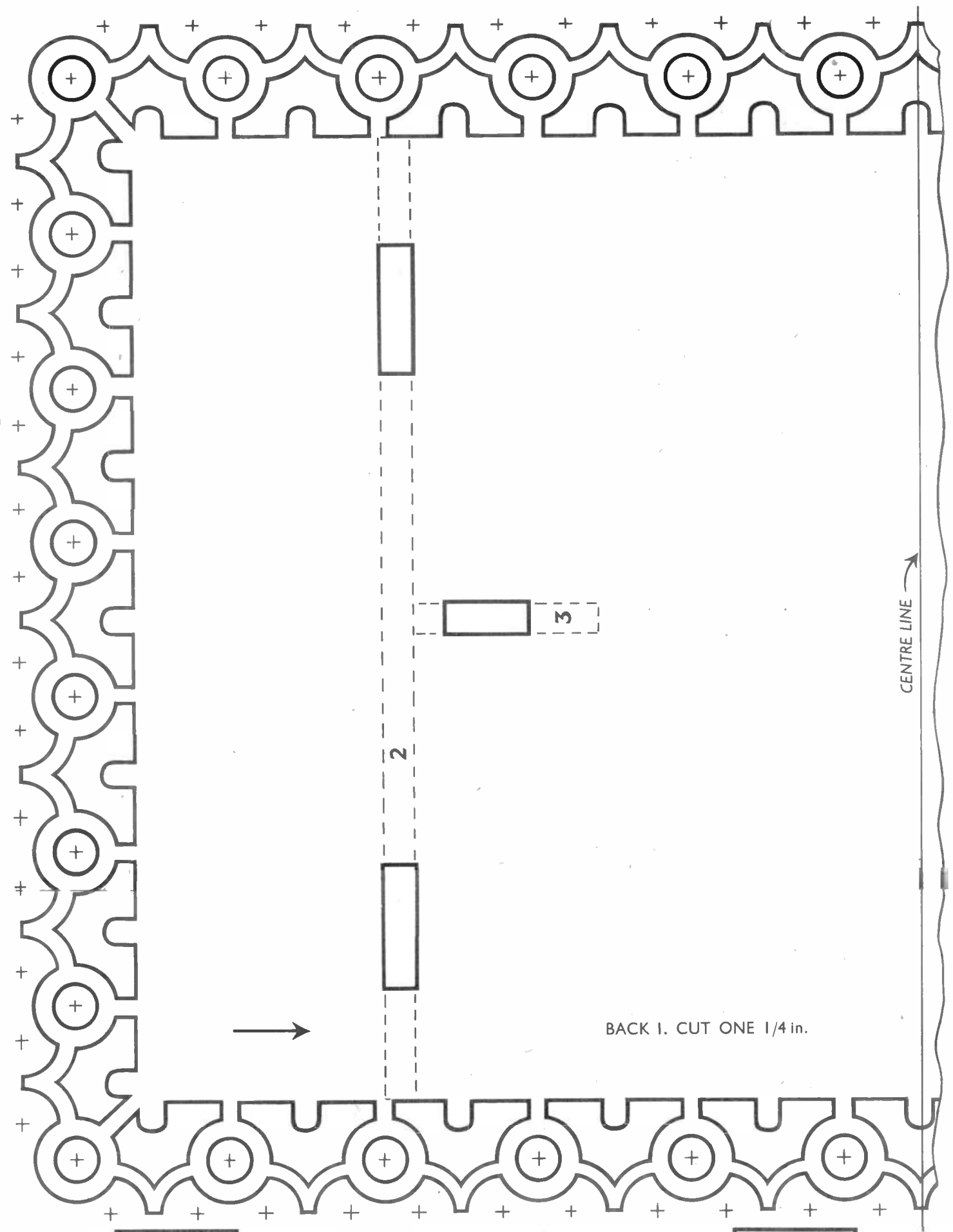
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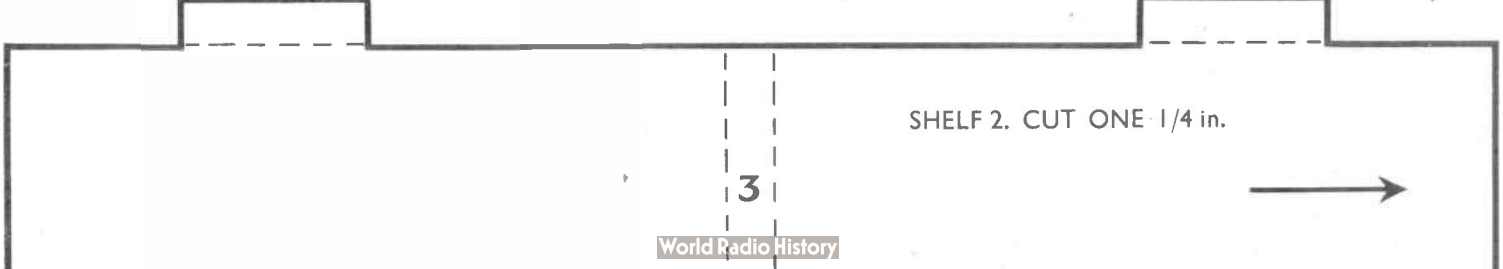
U.K. Orders 30/- and over post free

14 1/2
9 1/2 in.

E
T
M
W
A
F



BACK 1. CUT ONE 1/4 in.



SHELF 2. CUT ONE 1/4 in.

SIZE:
14½ ins. HIGH
9½ ins. WIDE.

CACTI WALL BRACKET



**EASY
TO
MAKE
WITH
A
FRETSAW**



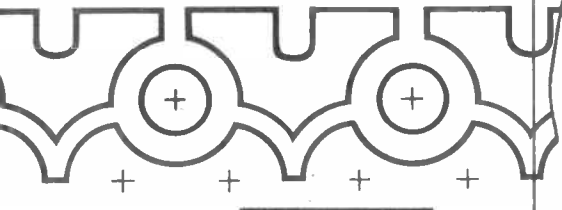
PANELS OF WOOD REQUIRED
FOR THIS DESIGN

ONE J4 ONE Q2 TWO G4

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

THE ARROWS
INDICATE DIRECTION
OF GRAIN
OF
WOOD

BACK 1. CUT ONE 1/4 in.



SHELF 2. CUT ONE 1/4 in.

Use

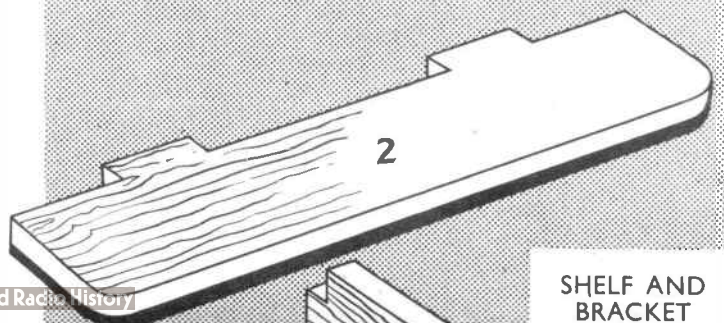
Croid UNIVERSAL

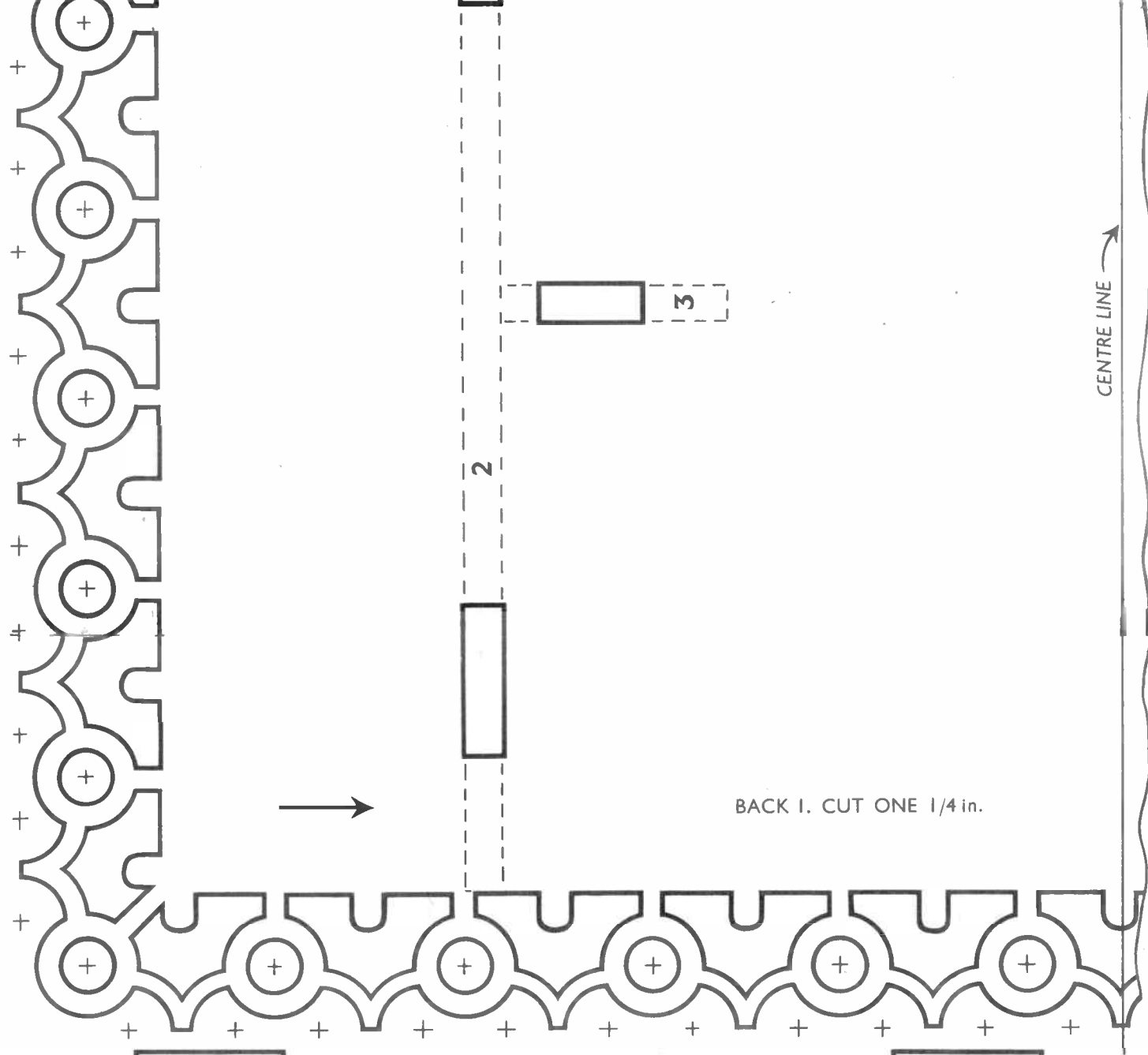
IT'S DESIGNED FOR THE JOB

The popular general purpose liquid glue,
used cold for all making and mending
with wood, leather, card, etc. The
best glue for sticking laminated
plastics. Large tube 1/2, 8 oz.
tin 2/10, 16 oz. tin 4/6



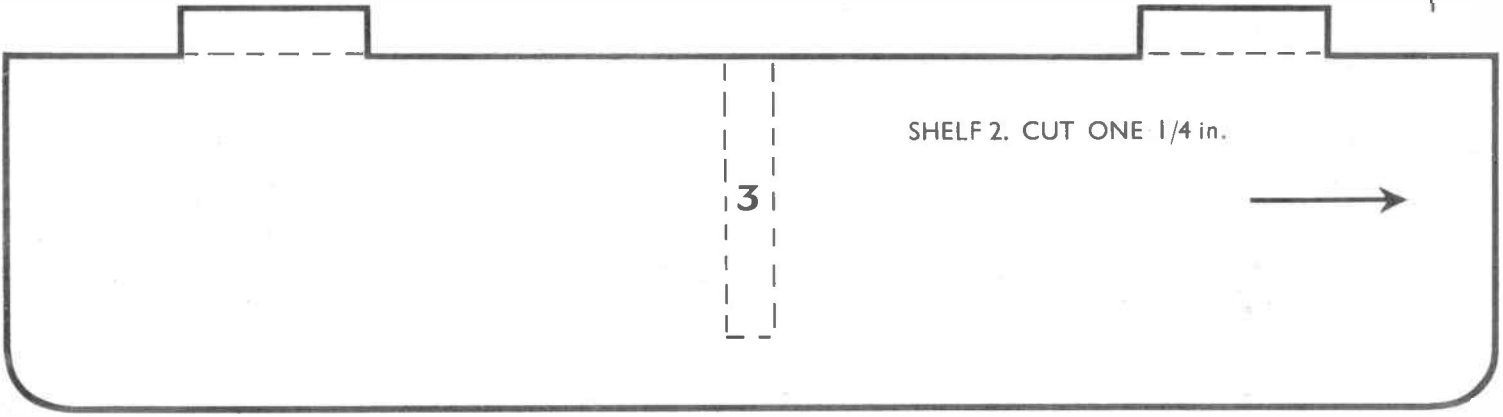
AVAILABLE FROM ALL BRANCHES OF HOBBIES LTD



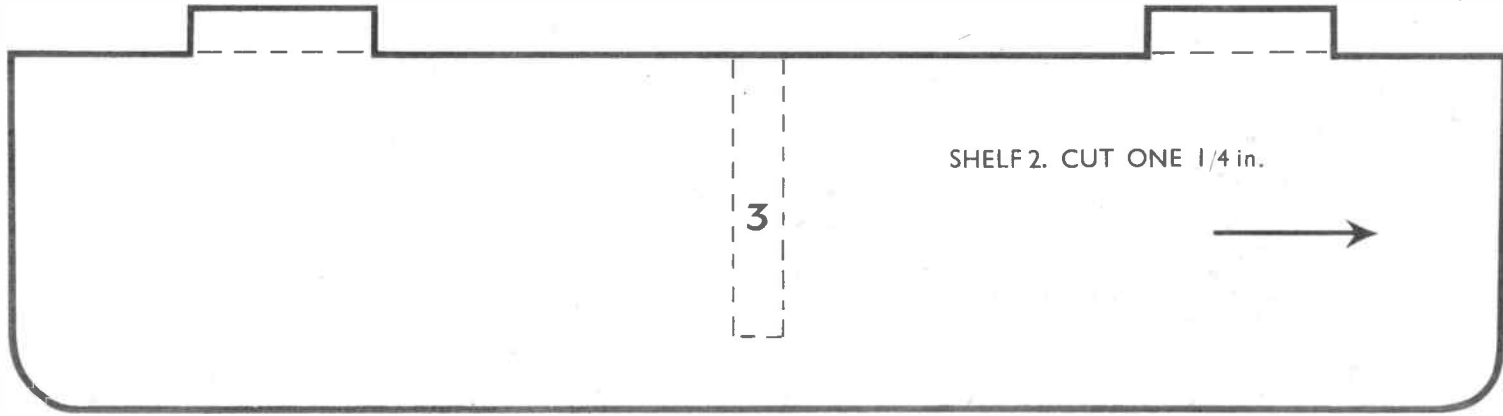


CENTRE LINE →

BACK 1. CUT ONE 1/4 in.



SHELF 2. CUT ONE 1/4 in.



SHELF 2. CUT ONE 1/4 in.

EASY TO MAKE WITH A FRETSAW



CENTRE LINE

PANELS OF WOOD REQUIRED FOR THIS DESIGN

ONE J4 ONE Q2 TWO G4

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

THE ARROWS INDICATE DIRECTION OF GRAIN OF WOOD

Use

Croid UNIVERSAL

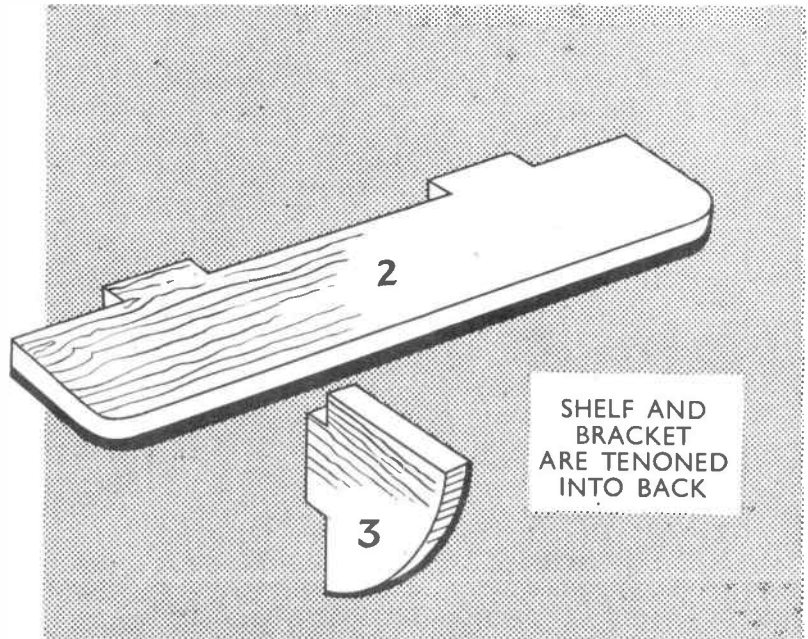
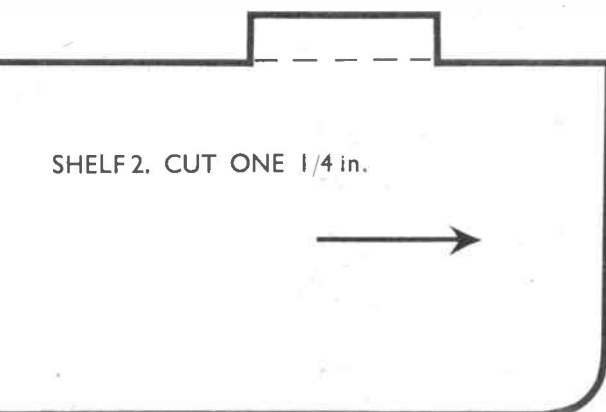
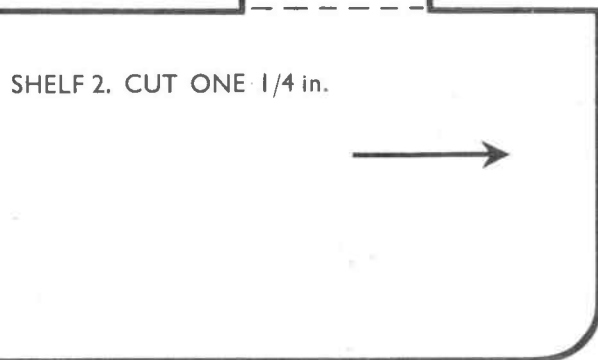
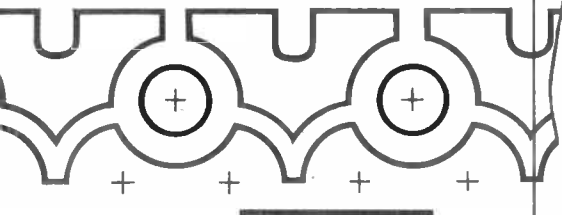
IT'S DESIGNED FOR THE JOB

The popular general purpose liquid glue, used cold for all making and mending with wood, leather, card, etc. The best glue for sticking laminated plastics. Large tube 1/2, 8 oz. tin 2/10, 16 oz. tin 4/6

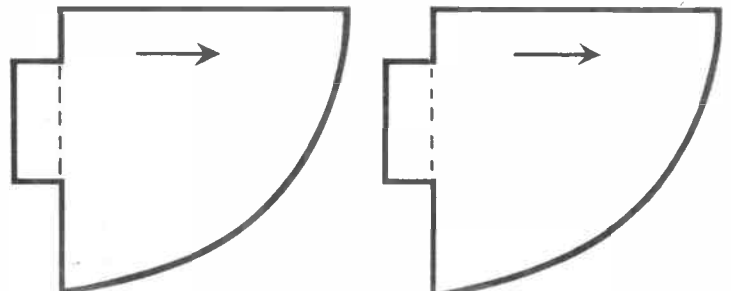


AVAILABLE FROM ALL BRANCHES OF HOBBIES LTD

BACK 1. CUT ONE 1/4 in.



BRACKETS 3. CUT ONE OF EACH 1/4 in.



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