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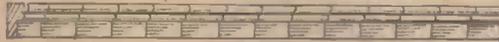
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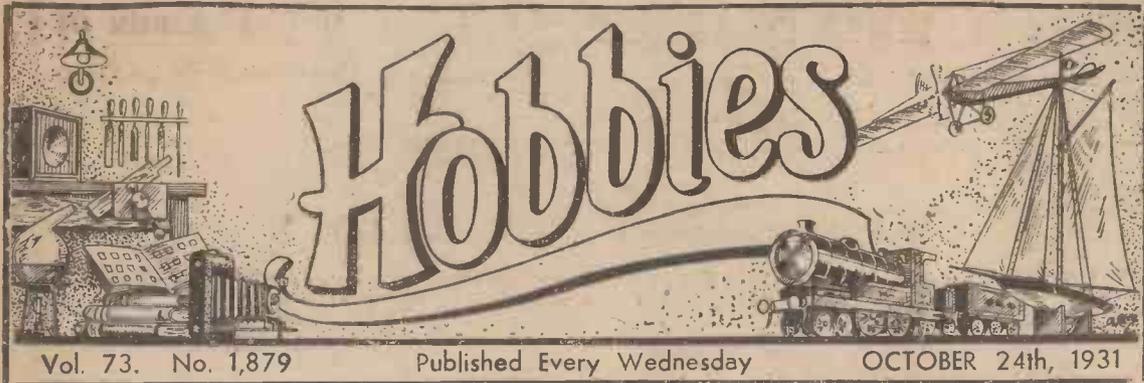


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ANOTHER FREE GIFT MODEL COMING SHORTLY!



THIS WEEK'S CLEVER IDEAS

An Electric Attachment for Lanterns and Cinematographs.

HERE is a little self-contained electric attachment for the magic lantern or home cinematograph, which you will find of great use if such happen to be at present illuminated by means of an oil lamp.

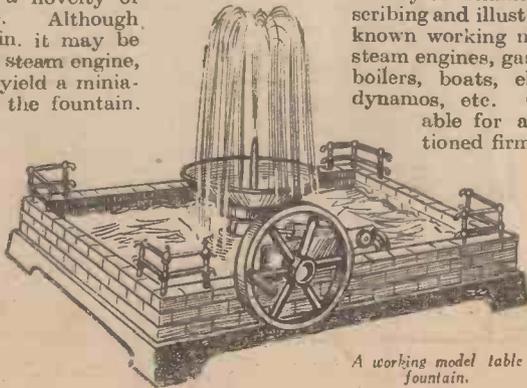


A self-contained electric attachment for magic lanterns and home cinematographs.

It consists of a battery holder, a switch, flash-lamp bulb and reflector mounted on a base and suitable for use with any magic lantern or cinematograph. It is supplied in two sizes at 1s. 3d. and 2s. We all know the disadvantages of oil lamps in connection with magic lanterns. These devices cannot be well ventilated without loss of light, and the light should be directed on to the screen through the lens. This usually results in a smoky instrument which soon is coated on the inside with a layer of soot. This device enables you to get over that difficulty in a simple and convenient way.

A Table Fountain.

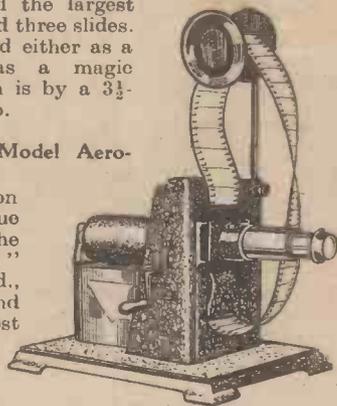
AT the foot of this page is a small working model table fountain—a novelty of a somewhat unusual type. Although measuring only 6½ in. by 6½ in. it may be driven by a model stationary steam engine, and the pump attached will yield a miniature cascade of water from the fountain. Its action is continuous. That is to say, once the trough is filled with water the pump draws it up, delivers it through the jet of the fountain and returns it to the trough again, this action continuing as long as the driving wheel is revolved. It costs 3s. The novelty may be used quite well as a table decoration.



A working model table fountain.

A Practical Toy Cinematograph.

THE paragraph in the first column, dealing with the electric attachment for magic lanterns, etc., reminds us that there is now on the market, at the very low price of 3s. 6d., the toy cinematograph illustrated here. It is supplied in three sizes, two of them having one film and three slides, and the largest size two 18ft. films and three slides. They can thus be used either as a cinematograph or as a magic lantern. Illumination is by a 3½-volt battery and bulb.



A practical toy cinematograph which costs only three shillings and sixpence.

A Neat and Cheap Model Aeroplane.

IN the paragraph on page 3 of our issue dated October 3rd, the price of the "Gnat" flier should be 1s. 3d., or by post 1s. 6d., and not 1s. 6d., or by post 1s. 9d. as stated.

A Model Catalogue.

WE have received from Messrs. Stuart Turner, Ltd.,

Henley-on-Thames, copies of their catalogue describing and illustrating the full range of their well-known working models. These lists deal with steam engines, gas and oil engines, petrol engines, boilers, boats, electric motors, lighting plants, dynamos, etc. Copies of these lists are available for a 1d. each from the above-mentioned firm.

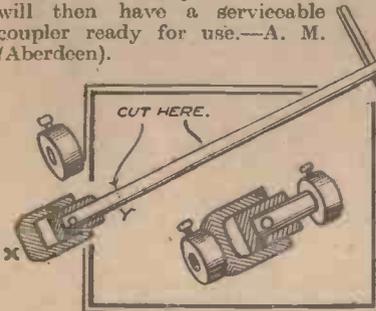
Experimental Electrical Sets.

THERE has just been marketed a very complete cabinet of electrical apparatus for experimental purposes at the reasonable cost of 7s. 6d. By means of the equipment provided you will be able to learn and demonstrate for yourself how electricity is generated.

NOTES AND NOTIONS from our READERS

An Easily-made Knuckle Joint.

MOTOR launch enthusiasts who require a flexible coupling for connecting the engine to the propeller can make one in the following manner. Obtain a "primus" stove nipple key and two bushes, as shown in the sketch. Cut the hand as shown and solder on the bushes where indicated by X and Y. You will then have a serviceable coupler ready for use.—A. M. (Aberdeen).



An easily-made knuckle joint.

A Novel Lock-Switch.

OBTAIN a round block, such as is used for mounting switches, etc., and a small brass lock. Cut a key-hole in the block and screw the lock inside the recess.

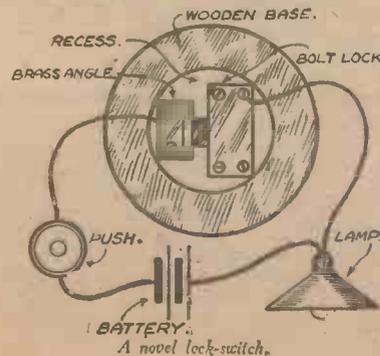
Take a piece of brass about 1/2 in. by 1 in. and bend it to the shape of a right-angle.

Screw this into the recess so that the bolt of the lock touches it when open, and breaks contact with it when closed.

Connect up, as shown in the sketch, and glue a circular piece of cardboard over the recess. A push can be included in the circuit.—A. D. (Neath).

A Use for Insulating Tape.

IN addition to the strictly legitimate use of this material, viz., to bind electric wires which have been spliced together, you will find it quite



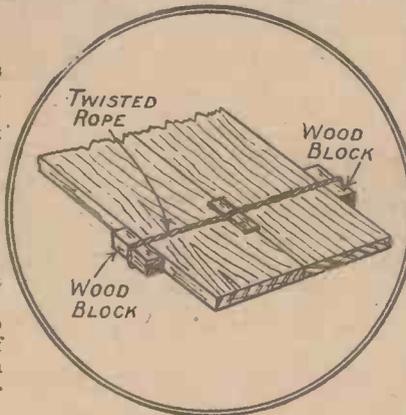
THAT DODGE OF YOURS?

Why not pass it on to us? We pay Five Shillings for every item published on this page. Mark your envelope "Notes and Notions." Every notion sent in **MUST** be original.

handy for mending split handles of garden tools. The tape should be bound round the damaged part as tightly as possible and left a few days to set. To remove stickiness, rub the outside of the tape with french chalk.

A Serviceable Cramp.

WOODWORKERS can make a simple and serviceable cramp in the following manner. Obtain two wood blocks, about 4 in. long and 1 1/2 in. square. These are placed at the sides of the board to be cramped as



shown. A rope is then passed round the blocks twice, and knotted. Place a small piece of wood between the two strands of rope and twist round.—W. M. (Ireland).

THIS WEEK'S MENTAL NUT.

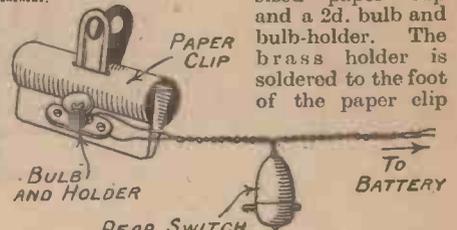
If a man buys 1 goose, 2 ducks, and 3 chickens for 4 dollars, and 2 ducks and 3 chickens are together worth 3 geese, and 3 chickens are worth 2 ducks, what is the price of each?

Answer to Last Week's Problem.

If you place your sheet of paper round the surface of a cylindrical bottle or canister, an oval can be drawn with one sweep of the compasses.

A Home-made Inspection Lamp.

ALTHOUGH "clip on" fittings can be bought for flashlamp bulbs and batteries, it is much cheaper to make these at home. The only materials required are a large-sized paper clip and a 2d. bulb and bulb-holder. The brass holder is soldered to the foot of the paper clip



PEAR SWITCH
A home-made inspection lamp.

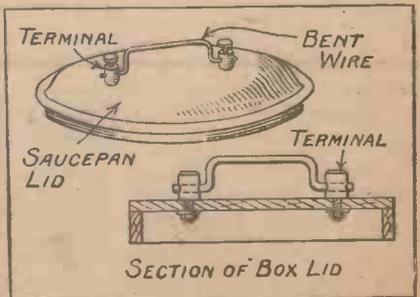
and the connections from the battery (usually an accumulator) taken to it via a switch, which can be of the pear-shaped type which hang from the flex, or a miniature tumbler switch, which can also be soldered to the clip. The clip can be used to fasten the arrangement on to any desired projection.—E. B. (Norfolk).

Repairing a Saucepan Lid.

A SIMPLE and easy method of replacing a saucepan lid handle can be accomplished by means of two wireless terminals and a piece of wire. Bore two holes in the lid and solder in the two terminals, as shown in the sketch. A piece of wire can then be bent to shape and inserted in the terminals, thus producing a serviceable handle.—H. T. (Ireland).

Writing During a Train Journey.

PEOPLE often want to write in the train, and do not find it at all easy to read what they have written. The only way to keep the hand steady is to support the forearm and wrist by pressing the elbow well into the body just above the hip. In reading, too, eye strain is reduced if you adopt the same plan to keep your book steady.



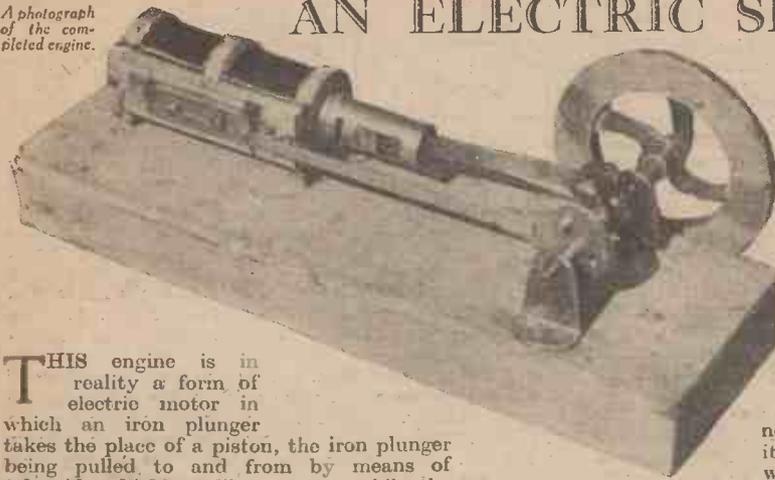
Repairing a saucepan lid.

A photograph of the completed engine.

AN ELECTRIC SLIDE VALVE ENGINE

By S. J. Garratt

A simple and easily-made Engine for driving your Models.



THIS engine is in reality a form of electric motor in which an iron plunger takes the place of a piston, the iron plunger being pulled to and from by means of solenoids which act like magnets while the current is "on," but cease to attract the iron when the current is "off." There are two solenoids placed end to end so that our engine is double acting, and the electrical contacts are operated by means of an eccentric and sliding contact arrangement. The complete model therefore looks very much like a real steam engine, but although not so powerful, it will run at a high speed from a six-volt accumulator, and is free from smoke and smell.

Figs. 1 and 2 show a sectional view and plan of the complete engine; Fig. 1, together with the remarks in the previous paragraph, will make the principle clear, so that we may proceed to consider constructional details.

The Base.

First make the base, which is in the form of an inverted wooden tray of the dimensions given in Fig. 1. The top may conveniently be made from a piece of $\frac{1}{4}$ in. three-ply wood and the sides of $\frac{1}{4}$ in. by $\frac{1}{4}$ in. material. This may be either tacked or screwed together.

Fig. 3 shows the construction of the double bobbin which takes the place of the cylinder and cross-head guide. The central portion is a piece of thin brass tube $\frac{1}{2}$ in. internal diameter and $4\frac{1}{2}$ in. long. The slots in the side can be cut out with a file, and two rings of brass wire about $\frac{1}{8}$ in. diameter are soldered on in the position indicated. These are to keep the wooden end cheeks in position. These end cheeks are made to the

dimensions given in Fig. 3. Two of the shaped pieces are required and one circular one; they should all be a tight fit on the tube and must, of course, all be threaded on to the tube before soldering on the wire rings.

The winding of the solenoids may now be tackled, and for this purpose it is well worth while making a rough winder as shown in Fig. 4.

Winding the Bobbin.

Buy a 4oz. reel of No. 24 gauge enamelled copper wire from an electrical dealer's. Fix the bobbin on the

winder and wrap a piece of writing paper round the central tube between the cheeks. The paper should be cut about $\frac{1}{8}$ in. wider than the distance between the cheeks and

nicked with scissors about every $\frac{1}{4}$ in., as shown in Fig. 5. This will allow the paper to splay out slightly (see Fig. 4) at the ends of the bobbin and prevent the wire touching the brass tube. Bind the paper on with a couple of turns of thin sewing cotton.

The end of the wire will probably be bent or kinked for a few inches, so cut this part off and thread (from the inside) the new end through the small hole near the

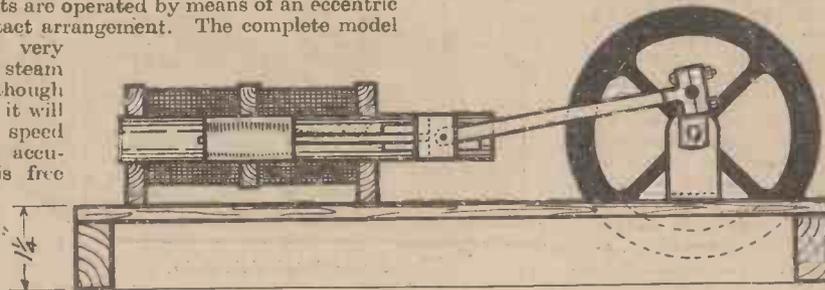


Fig. 1.—A Sectional View.

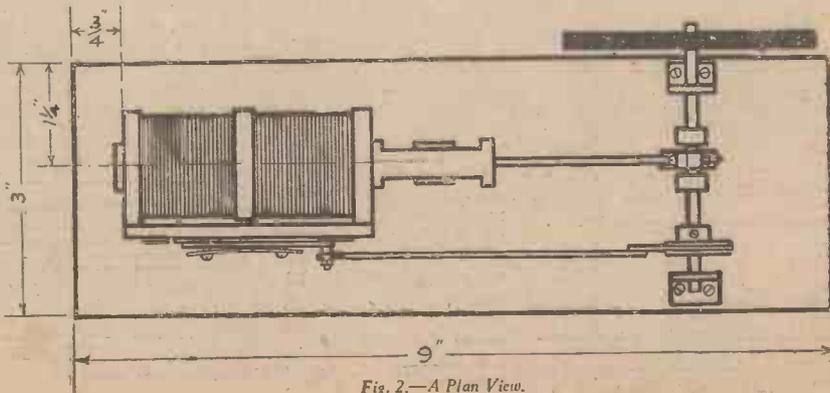


Fig. 2.—A Plan View.

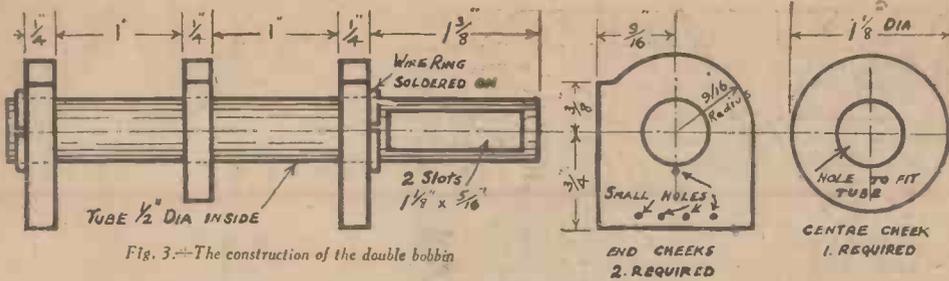


Fig. 3.—The construction of the double bobbin

centre of the bobbin, allowing about 4 in. to protrude, as shown in Fig. 4, then wind on a layer of wire. Keep the turns quite close together and fill up the space right up to the central cheek, the wire should be wound fairly tightly but not nearly tight enough to risk breaking the wire.

When the first layer is completed, wrap on another layer of writing paper exactly as before, then continue with the second layer. An assistant will probably be required when fixing the paper. Put on eight layers of wire altogether, with a paper between each layer, and be careful to see that the wire does not sink below its proper layer, particularly at the ends of the bobbin, otherwise there might be a short circuit and the model will not work. Careful fitting of the paper layers together with careful and close winding of the wire will avoid this. At the end of the eighth layer cut off the wire, allowing about 6 in. to spare, then thread this end to



Fig. 6.—How the bobbin is wound.

and fro through the four small holes as shown in Fig. 6; this will effectually hold the end of the coil and remove all danger of the wire becoming unwound.

The other half of the bobbin should then be wound in exactly the same manner. The direction of winding does not matter, though, of course, once winding has commenced it must continue in the same direction until that particular bobbin is filled.

Screw the solenoids down to the base by putting in small screws from underneath; the position is indicated in Figs. 1 and 2.

The Iron Plunger.

Fig. 7 shows the iron plunger and the crosshead. The plunger is just a piece of iron tube 1 1/2 in. long and about 1/8 in. thick. The outside diameter should be 3/8 in. or rather less, so that it will slide freely inside the central tube of the solenoids; if necessary, the plunger should be eased a bit with a file or emery cloth. It should move quite freely in the tube, a little shake will not matter; but it should not be smaller than necessary to allow of free movement.



Fig. 5.—A piece of paper should be wrapped round the bobbin.

Plug up the ends of the plunger with hard wood, and drill a central hole for the brass "piston rod." Solder two brass washers on to the 3/8 in. brass rod to prevent

soldered in place. The 1/8 in. hole is for a hinge pin.

The connecting rod is illustrated in Fig. 7. The big-end bearing is made from 1/4 in. thick brass filed to shape; it should be split and the small bolts fitted before the central 5/32 in. hole is drilled. The rod itself is a separate piece of brass soldered into a slot in the big-end bearing. The crankshaft is made from a piece of 5/32 in. steel, but the webs are of brass 1/4 in. square in section. Both webs should be drilled together, so as to keep the holes in line. The method of assembly will be shown next week, but it may here be stated for those who wish to proceed in advance of those instructions that the two webs are soldered together and

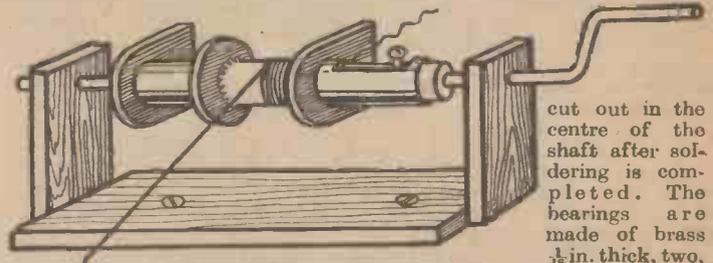


Fig. 4.—Details of the winder.

cut out in the centre of the shaft after soldering is completed. The bearings are made of brass 1/16 in. thick, two, of course, being required. These, too, will be dealt with next week. A suitable flywheel can be bought at a model engineer's store for a few pence. It should be 3 in. in diameter and bored to fit a 5/32 in. shaft, the boss being tapped for a grub-screw. Choose a well-finished flywheel which will greatly add to the appearance of the model. If the reader wishes to make his own flywheel he can do so without the use of a lathe by cutting one out of 1/8 in. sheet brass with a fretsaw. The boss should be made from a brass collar soldered on to the centre. These collars can be obtained from toy shops complete with grub-screw.

Extra weight should be added to the rim by cutting out two rings of 1/16 in. sheet brass (3 in. outside diameter and 2 in. inside), and soldering a ring on each side of the wheel already cut out. The flywheel shown in the photographic illustration was made like this.

(To be concluded next week.—Ed.)

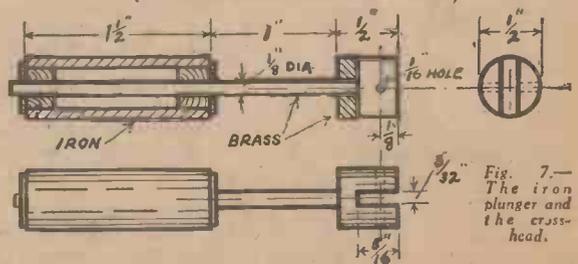


Fig. 7.—The iron plunger and the cross-head.



This photograph shows the uncoversed framework of the completed glider.

BUILDING A FULL-SIZE GLIDER

By F. J. CAMM

(Concluded from page 67, Oct. 17th issue.)

WITH the two sides of the central cellule complete the two rails to carry the pilot's seat (Fig. 12) may be fitted, and then the control lever shown in Figs. 15 to 17. This it must be remembered has two kingposts attached to it, one on each side to carry the wires which control the movement of the tail elevator. In Fig. 1 (page 66 of last week's issue), the position of the tube socket joints were marked. These tubular sockets (illustrated in Fig. 4), enable the tail and wing portions to be removed. When the tail bearers are pressed tightly home into the sockets, two holes are drilled in each socket for a bolt and wing nut; twelve of such wing sockets will be required. The joint at the tail end of the fuselage is drawn in Fig. 9. Assemble the cross-members of the fuselage

and it is pivoted in the centre for sideways movement which controls the ailerons. This control is instinctive; when the control lever is moved to the left the glider will bank to the left and so on. A backward movement will cause the glider to ascend and the reverse movement will cause it to descend.

The Control Wires.

Double pulleys are fixed to the top wing, and the control wire passes direct from the lever over one pulley to the bottom of the aileron kingpost on the other side. Next pass one length of wire from the bottom of the kingpost over the second pulley on each side and so to the top of the second kingpost. Next attach the wires from the control lever to the two kingposts on the tail elevator. The top of each elevator kingpost is connected to the bottom of the control lever kingpost. Ordinary hinges are used to fix the elevators and ailerons. The kingposts are attached to these parts as shown in Fig. 10. It is wise to make up some wire strainers as illustrated in Fig. 20 from motor-cycle spokes and sheet steel. These will enable stretch in the wire to be taken up.

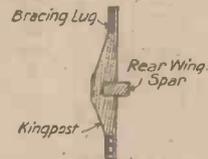


Fig. 10.—The aileron kingpost.



Fig. 12.—The adjustable pilot's seat



Fig. 13.—How to clip the wing-tip skids to the wing struts.



Fig. 6.—How to fasten the wire edge to the wings.



Fig. 7.—Lugs for bracing the mainplanes.



Fig. 8.—The strut section.

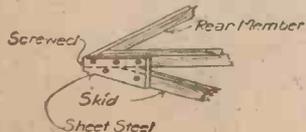


Fig. 9.—Joint at the tail of the fuselage.

in the manner shown in Fig. 10, fixing suitable lugs to the bracing wires under the heads of the bolts. Two rear skids are required, one for each of the bottom members. Stout cane will serve for these, and they should be lashed to the tail members as shown in Fig. 22. Their main purpose is to prevent the tail from striking the ground, and to prevent damage when landing. The seat is provided with the slide adjustment indicated in Fig. 12.

It can be made from a piece of three-ply with an aluminium back. The control lever is moved backwards and forwards for elevator control,

The Axle and Wheels.

A steel tube is used for the axle and it should be plugged solid with a round ash rod; the axle ends are fixed into this axle by means of taper pins. Large steel washers are also taper pinned into place to form a fixing for the rubber suspension as illustrated in Figs. 18 and 19. The wheels may be 15in. motor-scooter wheels which are readily obtainable second-hand. Rubber cord is also obtainable from most garages.

The Mainplanes.

The planes are not represented as being of extremely efficient section, but they have the great advantage of being quickly repaired, quickly made and providing

sufficient lift for reasonable gliding purposes. They are plan braced by means of the wing bracing lugs illustrated in Fig. 7. The end ribs should be of T section to resist the pull of the fabric and the aileron should be braced with a wooden strip as illustrated in Fig. 14. The trailing edge of the wings is flexible, the wire being secured to each rib as sketched in Fig. 6. Before covering the wires will be perfectly straight. The scallops form

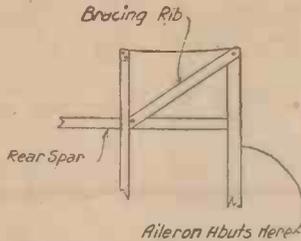


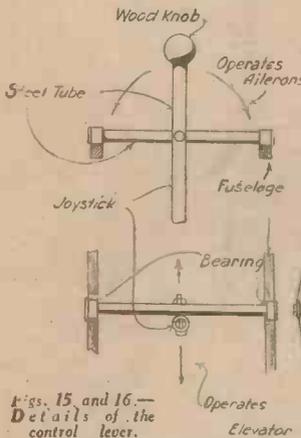
Fig. 14.—How to strengthen the ailerons.

great care should be expended in getting all of them identical. They are glued and screwed to the wing spars.

Covering.

Before covering is commenced the inter-strut sockets must be made and secured to the spars. They consist of steel tubing, slit down a certain distance with a hacksaw and spread open to form the bracing lugs (see Fig. 5). The tubing should be of such a size that the inter-struts drive fairly tightly into them; the inter-struts themselves are of streamlined section as indicated in Fig. 8. Two half-elliptic skids are attached to the lower end of the end inter-struts (see Fig. 13) by means of a simple clip and bolt. The fabric should be stretched over the wing from end to end and secured to the ribs by tacking strips of cane over them. It is then tacked along under the leading edge and stitched over the trailing edge, carefully pulling out all the wrinkles and stretching it as tightly as possible. When the planes are covered they should be given two thin coats of linseed oil and varnish mixed in the proportions of one to three. In bracing up the wings see that the correct dihedral angle is given (see Fig. 2).

The tail and bottom plane is secured to the fuselage in the manner shown in Fig. 23. The tail and rudder are constructed in the same way as the mainplanes (see Figs. 24 and 25). All of the fittings to this glider are cut from .18-gauge sheet steel. The axle is of steel tubing 1 1/2 in. in diameter and unbleached calico is used for covering the wings. Bowden cable is used for the control wires; bracing wire for the wings is 18-gauge steel piano wire, 16-gauge piano wire being used for the chassis. Readers in need of further information should address a letter to the Editor, marked "Glider."



Figs. 15 and 16.—Details of the control lever.

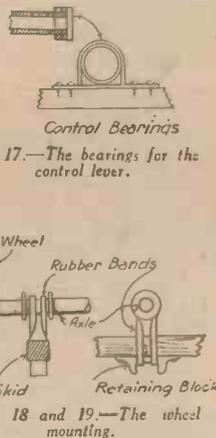
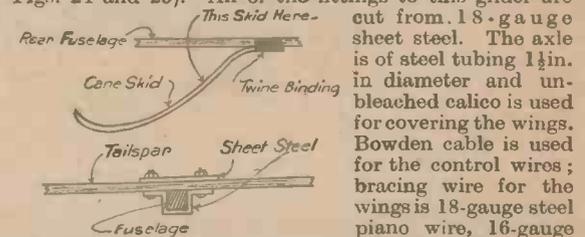


Fig. 17.—The bearings for the control lever.

Figs. 18 and 19.—The wheel mounting.

naturally when the fabric is pulled over it. Fig. 21 indicates a section of the wings, and indicates quite clearly the form of construction adopted. The ribs are steam cambered to a full-size wooden template and



Figs. 22 & 23.—Tail skid and tail fastening.

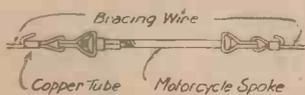
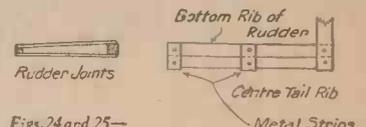


Fig. 20.—How to make the wire strainers.



Fig. 21.—Section through the mainplane.



Figs. 24 and 25.—Rudder details.

TEAPOT STANDS FROM TILES

THIS suggestion for simply-made teapot stands by using up odd hearth tiles was sent in by J. Niets, of Birkenhead. The tile, as can be seen from the illustration, is let into a circle of wood. The actual size depends, of course, on the measurements of the tile, but the square hole is cut with the fretsaw. The tile is prevented from dropping right through by strips underneath. The edge of the opening is decorated with ornamental beading or similar fancy stuff, whilst the surface is further decorated with the raised square ornaments or some of the other wood carvings



which are so popular now. The whole stand is raised on little wooden feet glued in line with the corners of the tile. See they are fixed securely or one may slip off and the stand tilt just when a teapot is being placed on it. The whole stand can be stained and polished or varnished. One must take care to get a good circle in cutting, or the whole effect will be spoiled. It is, of course, a simple matter to mark out the circle on the wood with a pair of compasses, but more care is needed when you use the fretsaw for cutting it out.

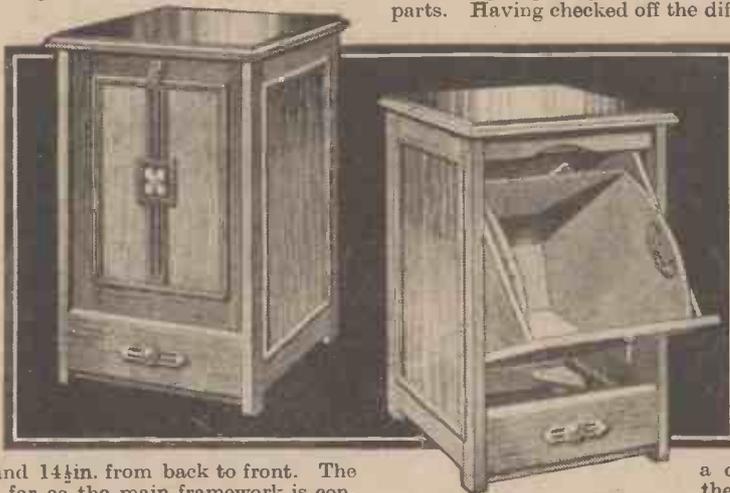
Specially designed for the amateur carpenter and fretworker. Patterns free on the design chart.

HOW TO MAKE A COAL CABINET

A full-size piece of furniture built in mahogany. All wood and fittings obtainable for 30/-

THE subject of this week's design sheet forms one of those sensible pieces of carpentry which are an asset to any home, and yet which the amateur fretworker of some experience can complete without

undue trouble and expense. There are so many readers who handle carpentry and fretwork tools with great ability, and they should find little difficulty in putting together the splendid coal cabinet illustrated here. It is a full-size piece of furniture, and its drop front container holds a coal scuttle of the ordinary dimensions. The completed cabinet stands nearly 2ft. high, 15½in. wide, and 14½in. from back to front. The wood throughout so far as the main framework is concerned is ¾in. stuff, so that a rigid and very satisfactory piece of work is completed. It can, of course, be made up in either oak or



A parcel of planed mahogany with all parts required, including dowell, ornaments, moulding, etc., is supplied for this by Hobbies Ltd. for 21/- carriage forward. A complete set of fittings—metal coal container and shovel, swivel pins, drop ornamental handle, etc., costs only 7/6. The whole lot sent together for 30/-, carriage paid.

far as possible, and pencilling and measuring across the lot instead of taking each one separately. This ensures the dowels being driven in opposite each other, and so making a good joint without wringing the various parts. Having checked off the different pieces of wood

required in conjunction with these patterns, next get an idea of the construction by reading this article through. Then set to work on its actual making, taking care at any possible joint to test up the joints and the parts one with the other.

When closed, the cabinet has a plain panelled and decorated door, but this door, instead of being hinged as usual, is fitted to a container which holds the coal scuttle. This container is pivoted inside the cabinet itself so that when the door is pulled forward the coal and shovel are there ready for

use, as shown in the picture of the cabinet open.

Forming the Sides.

Commence work by forming the frame of the two sides. This consists of two upright rails, a top and bottom cross rail and a centre cross rail (see Fig. 1). The top and bottom rails are dowelled between the two uprights, but the centre rail is let in so that the face is flush (see Fig. 2). A little way along this centre rail from the front a recess has to be cut to take the socket plate. The position of this is indicated on the design part and must be accurately cut so that the brass plate of the fitting can be sunk flush with the rail itself. The plate is fitted 2½in. inwards from the front end of the rail, and a central hole is drilled to take the pin of the pivot. A detail of this can also be seen at Fig. 2. As shown in Fig. 1, the side itself is composed of a panel of plywood, and this is held in place behind with fillet strips glued round the framework. By fitting these fillets flush with the inside face of the frame, a recess is formed for the plywood which is, in turn, held

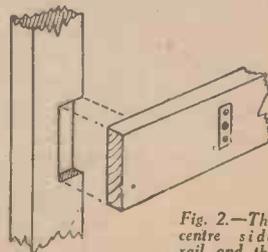


Fig. 2.—The centre side rail and the pivot hole for the container.

mahogany, according to the requirements of the rest of the furniture of the room. In order, however, to save a good deal of marking out and measuring, the reader has the advantage of being able to obtain a parcel of mahogany planed and ready for all the parts required. The cost of this is only 21/-, and it includes the moulding, beading, and fancy ornaments required for decoration.

Check the Patterns.

The various parts to be cut are shown in complete detail on the design sheet, and most of them are only plain rectangles which can be sawn and planed true in the ordinary way with carpentry tools. It is, however, essential to paste the patterns down to the various parts because in a number of cases dotted lines indicate the adjoining positions of other parts, and these positions must be marked carefully.

To lessen the work involved in construction, the various joints are made with dowel pins. Wherever these are used it is essential to mark the parts off carefully by laying them all together as



Fig. 1.—A detail of one of the sides.

by strips of the No. 24 moulding glued and nailed round.

Mark Positions Clearly.

Before cleaning off the paper pattern mark clearly—in pencil or with a pricker—the position of the various cross rails, etc. The dowel holes are indicated on the patterns, and this makes it simple to frame up the cabinet to the correct dimensions. The front and back rails are lifted $\frac{7}{8}$ in. from the bottom, but the top rails are flush with the upper edge. The back cross rails (see Fig. 3) are merely plain rails doweled in position; the front ones require a little more attention. The lower front cross rail provides a stop for the door when it shuts and so must be composed of two parts. The bottom front rail is cut $12\frac{1}{2}$ in. long, 4 in. wide and $\frac{3}{4}$ in. thick, its upper edge being chamfered inwards slightly.

The Front Two-piece Rail.

Dowels are fitted each end. To the front of this piece is glued the bottom front rail, a piece $12\frac{1}{2}$ in. long, 4 in. wide and cut from $\frac{3}{4}$ in. wood. The top edge is rounded and the part is glued to the other rail so that $\frac{3}{4}$ in. projects above and is correspondingly short at the bottom. A detail of one end of this part is shown at Fig. 4. Be careful to dowel it in its correct position between the side frame. At the top another style of rail is fitted to provide a stop for the door. This is the top front rail in $\frac{3}{4}$ in. wood from the centre of which an arc is cut to allow the passage of the shovel handle later. This rail is set back $1\frac{1}{2}$ in. from the front edge of the side frame. Thus, when the front of the cabinet rests against it, it is directly in line with the bottom front rail just fitted. A sectional drawing showing the door closed (a) and open (b) (without the top) is given at Fig. 5. The back itself is merely a plain piece of plywood glued and screwed to the framework provided.

Strengthen with Blocks.

The bottom framework is stiffened by $\frac{1}{2}$ in. blocks,

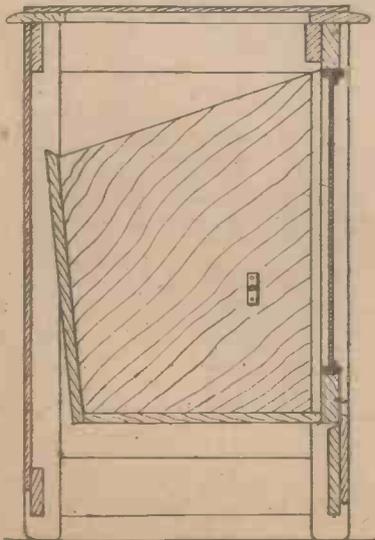


Fig. 5a.—A section showing the door closed with the container behind it.

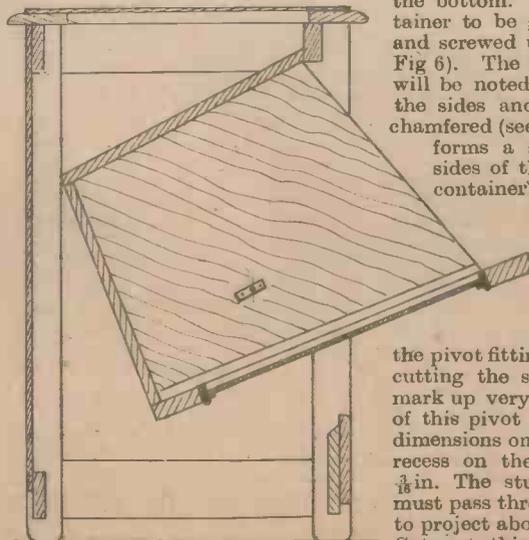


Fig. 5b.—A similar detail, but showing the door open and the container ready to use.

one of which can be seen in position in the picture of the cabinet open. Six are cut, and the other two are glued in the angle behind the front top rail.

The next job is to complete the container which is illustrated in detail at Fig. 6. This is built up in cheaper wood, and fixed behind the door to hold the metal coal scuttle supplied. The door itself is framed up with two cross rails and two uprights, all in $\frac{3}{4}$ in. stuff and all doweled together. As in the sides, a fillet strip is glued flush with the back edge to form a rebate for the plywood. On the front the No. 24 moulding is

glued into the corner and a long ornamental fret with a square carving is added as shown. At the top an oxidized drop handle is fitted through. The section of Fig. 7 shows how the part is built up. The cheap container fitted behind the door is cut from $\frac{1}{2}$ in. wood and composed of two sides, a back and a bottom. They form a hollow frame (Fig. 6) the same width as the door itself.

Details of the Container.

In order screws should not be driven through the front, however, two pieces of cheap wood are glued and screwed to the back of the door $\frac{1}{2}$ in. inwards from the edge and stopping off $\frac{1}{2}$ in. upwards from the bottom. This allows the container to be glued into the corner and screwed up to these strips (see Fig. 6). The back of the lining, it will be noted, sticks a little above the sides and has its inside edge chamfered (see Fig. 6). This chamfer forms a straight stop on the sides of the top rail when the container is pulled forward, and makes a more workmanlike finish than if the wood just rested on the edge.

It is to the sides of this container that the other portion of the pivot fitting has to be fixed. In cutting the sides of the container, mark up very carefully the position of this pivot pin, according to the dimensions on the pattern, and then recess on the inside to a depth of $\frac{3}{8}$ in. The stub pin of the fitting must pass through a hole in the side to project about $\frac{1}{2}$ in. to $\frac{3}{4}$ in. beyond. Get out this recess, cut the hole,

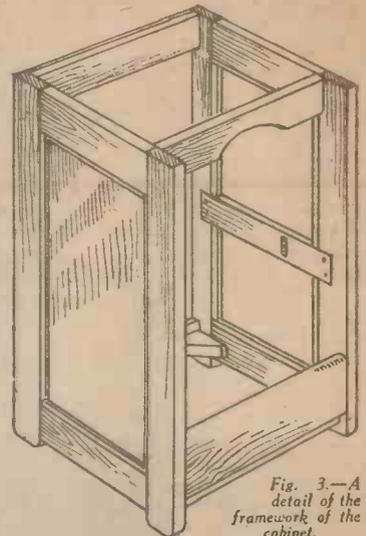


Fig. 3.—A detail of the framework of the cabinet.

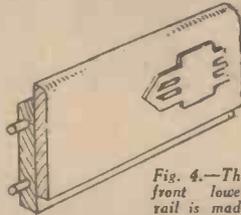
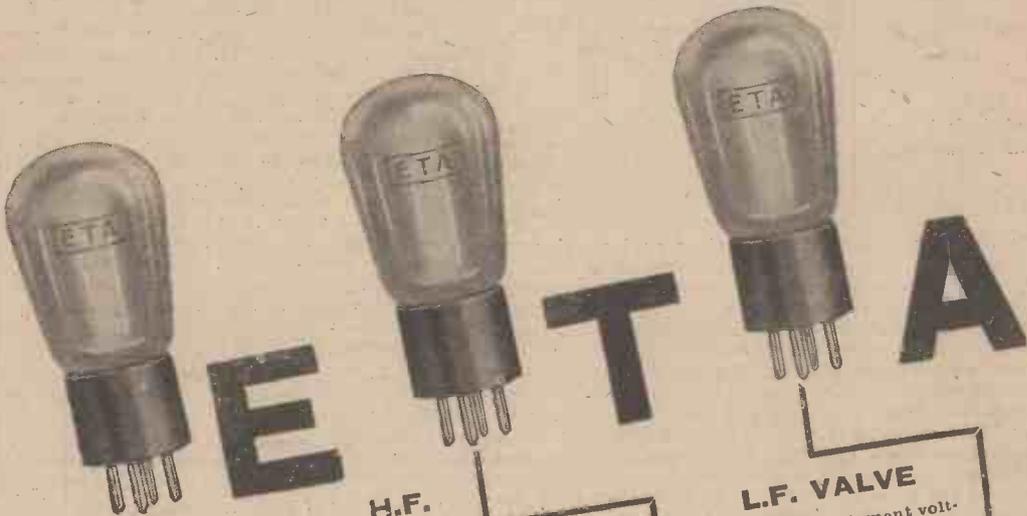


Fig. 4.—The front lower rail is made up like this.

(Continued on page 86.)

COMPONENTS FOR HOME-MADE 3 VALVE SET.

• ETA Valves are right in performance and price



POWER VALVE

1. Maximum filament voltage, 2.0 volts.
2. Filament current, 0.32 ampere.
3. Maximum anode voltage, 150 volts.
- *4. Amplification factor, 6.5.
- *5. Impedance, 1,900 ohms.
- *6. Mutual conductance (slope), 3.4 mA/V.
7. Average anode current, 12 mA.
(For 150 volts anode voltage and -12 volts grid bias.)
8. Maximum undistorted output, 330 milliwatts.
(For 150 volts anode voltage -12 volts grid bias and 12 mA anode current.)
9. Optimum load for maximum undistorted output, 5,500 ohms.
10. Maximum overall length, 112 mm.
11. Maximum diameter, 45 mm.
* At zero grid volts and 100 volts anode voltage.

PRICE 8'-

H.F. or DETECTOR VALVE

1. Maximum filament voltage, 2.0 volts.
2. Filament current, 0.12 ampere.
3. Maximum anode voltage, 150 volts.
- *4. Amplification factor, 20.
- *5. Impedance, 10,000 ohms.
- *6. Mutual conductance (slope), 2 mA/V.
7. Average anode current, 4 mA.
(For 150 volts anode voltage and -2.5 volts grid bias.)
8. Maximum overall length, 107 mm.
9. Maximum diameter, 45 mm.
* At zero grid volts and 100 volts anode voltage.

PRICE 7'-

L.F. VALVE

1. Maximum filament voltage, 2.0 volts.
2. Filament current, 0.20 ampere.
3. Maximum anode voltage, 150 volts.
- *4. Amplification factor, 13.
- *5. Impedance, 4,000 ohms.
- *6. Mutual conductance (slope), 3.2 mA/V.
7. Average anode current, 6 mA.
(For 150 volts anode voltage and -6 volts grid bias.)
8. Maximum undistorted output, 130 milliwatts.
(For 150 volts anode voltage -6 volts grid bias and 5 mA anode current.)
9. Optimum load for maximum undistorted output, 3,000 ohms.
10. Maximum overall length, 107 mm.
11. Maximum diameter, 45 mm.
* At zero grid volts and 100 volts anode voltage.

PRICE 8'-

THE ELECTRICAL TRADING ASSOCIATION LTD., ALDWYCH HOUSE, ALDWYCH, LONDON,

Telegrams: Eltradax, Estrand, London.

Telephone: Holborn 8139. W.C.2.

Irish and Scottish Agents: W. J. Byrne, 21, Temple Lane, Dublin.

R. G. Jackson Nisbet, 132, Renfrew Street, Glasgow.



Made in Stripwood and Dowelling.

THE best way to store fruit such as apples and pears for the winter is by laying out in a suitable rack. A handy form of storing rack which is constructed in stripwood and dowelling is illustrated herewith and proves quite simple for the amateur.

To make the rack, first cut off four lengths of 1 in. by 1 in. stripwood, 5 ft. 2 1/2 ins. long, and mark off the four positions for the mortises on one side of each (Fig. 1). These mortises are cut 1/2 in. deep and made 1/2 in. long by 1/2 in. wide to take the side supports which hold the dowelling. The mortises are easily cut by first drilling a hole and then cutting out the corners with a small wood chisel. Now mark off the other two mortises at the top and bottom on two of the pieces, as indicated in Fig. 1, and cut them the same size and depth. These will be for the back spacing supports of the rack. Cut the mortises for the two front spacing supports in the same manner, taking care to mark them off so the mortises for the rod supports will face each other.

Four spacing supports are required, two for the front

A HOME-MADE FRUIT-STORING RACK

of the rack and two for the back, and details of these are given in Fig. 2. The supports are cut from 1/2 in. by 1 in. stripwood 3 ft. long and a tenon is cut on the end of each piece 1/2 in. by 1/2 in., as indicated. Make the tenons a good fit in the mortises in the uprights. Eight pieces of the same size and length stripwood are required for the cross dowel rod supports.

For the shelves of the rack cut off 48 pieces of 1/2 in. dowelling, each 3 ft. long. These are best obtainable in a bundle, like the stripwood, from Hobbies Ltd. The rack is now ready to put together. First, put the parts of the frame together by means of a little glue, applied to the joints, and allow these to set quite hard before fixing in the dowelling. Commence on the bottom shelf first and fix the dowel rods in with glue; it is a simple matter to push one end in first and then slide the other end in the opposite hole. The rods will end about half-way in the holes, so take care to get them all about the same. By starting on the bot-

tom shelf first and then working upwards you will always have a clear space to work in. Test for squareness and length as you proceed, and don't let the parts "wring" at all.

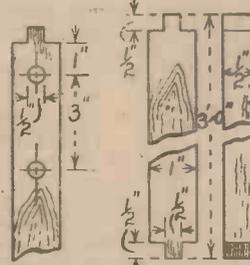


Fig. 3.—The cross-bars.

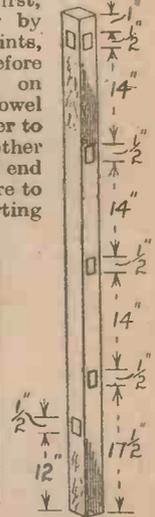


Fig. 1.—The corner posts.



Fig. 2.—The spacing supports.

HOW TO MAKE A COAL CABINET (continued from page 84).

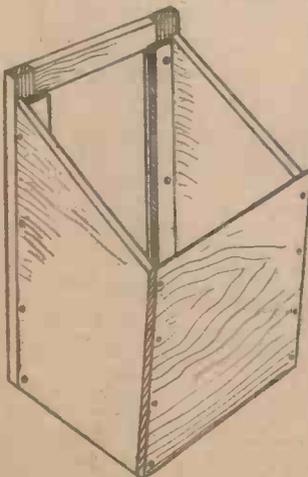


Fig. 6.—A close-up of the actual coal container.

and temporarily test the part in place, but do not fix it in yet. It is impossible to get the container into position if these fittings are put in now. The correct swing of the container is only brought about by accurately fitting these pivoting points.

One portion of the pivot fitting has already been fixed into the side rail. Now put in the container and get the door properly in place.

This should bring the hole in the side of the container in line with the hole made in the centre rail of the side frames. Then the other portion of the pivot pin

is put through from inside the container into the recess made, and there screwed in place. This provides a swivel for the container itself which is then ready to receive the metal scuttle and shovel supplied with the rest of the fittings.

So far there is no top. It can now be added by making a hollow frame of 3/4 in. wood and gluing above it a square of mahogany 1/2 in. thick. The lower frame can be seen on the sheet. The front rail of this frame has both ends mitred; the side rails have one end mitred; the back rail has both ends cut square. The pieces cut away when the parts are mitred are used to form the angle blocks to stiffen up the frame, and all are glued together flat and true. Then put the hollow frame on the top of the cabinet, flush with the back, to project equally over the sides and front. Glue and screw it to the framework and then add the square top above all.



Fig. 7.—A broken away picture of the door, rails, overlays, etc.

AN ELECTRIC STANDARD LAMP

This handsome lamp standard is 4ft. 6in. tall, and can be cut in oak by any owner of a few carpentry and fret-work tools. A parcel of materials is supplied, as below.

THE electric standard lamp illustrated can be made and built up quite simply with any ordinary kit of tools. It stands 4ft. 6in. tall, and consists of a hollow column supported on four feet. At the top is a shade of either card or thin three-ply wood. The bulb is fixed to a socket at the top of this shade, and the whole supported by ornamental brass or copper strips.

Making the Column.

For the column get four pieces of $\frac{1}{2}$ in. wood, 4ft. 6in. long; two pieces being 3in. wide and two pieces 2in. wide. At the centre of one end of each piece mark a mortise 4in. long by $\frac{1}{2}$ in. wide, and cut out with the fretsaw. Now glue and screw the four pieces together to form a hollow column (in plan Fig. 1 and side view in Fig. 2). To the bottom end of the column fix a square of $\frac{1}{2}$ in. wood with a $\frac{1}{2}$ in. hole cut in the centre through which to pass the flex.

Four feet are cut from $\frac{3}{4}$ in. or $\frac{1}{2}$ in. stuff, each 10in. long and 7in. wide, and Fig. 3 is a diagram for marking on to the wood. On one piece set out the squares and the outline, cut out the foot with a coarse fretsaw, and use this as a templet for marking out the other three. Glue the feet securely in the column, and run a screw through the top of each for additional strength. Fig. 4 shows how the feet can be built into the column by a mortise. A 2in. square of $\frac{1}{2}$ in. wood is cut, and a $\frac{3}{4}$ in. hole made in the centre of it. The piece is let into the

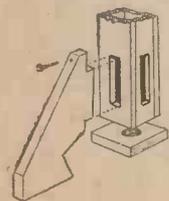


Fig. 4.—The feet fitting into the column.

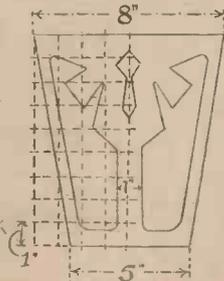


Fig. 5.—Detail of one side of the shade.

Suitable paned oak, cut ready to size required, is supplied by Hobbies Ltd., for all parts, for 13/6, and sent carriage forward. Below is a list of the necessary parts.

- 2 pieces 4ft. 6in. long by 3in. wide by $\frac{1}{2}$ in. thick.
- 2 " 4ft. 6in. " " 2in. " " $\frac{1}{2}$ in. "
- 1 piec 4in. " " 4in. " " $\frac{1}{2}$ in. "
- 4 pieces 10in. " " 10in. " " $\frac{1}{2}$ in. "
- 4 pieces of thin plywood 9in. long by 8in. wide.

knife. If the shade is to be made up in card, a large sheet will be required, and the templet will be drawn round four times. With a thin wood shade, four pieces of three-ply will have the design cut in and afterwards fitted with a square three-ply top and base. A ply-wood top and base will also be needed if the shade is made of card, strips of gummed tape holding all the parts together. A 3in. diameter hole will be cut in the three-ply top of the shade, and over this will rest a piece of $\frac{3}{4}$ in. wood, with the metal bulb-socket attached. Two round-headed screws will fix this piece to the three-ply top making for easy removal for repair when necessary.

The Ornamental Supports.

The ornamental metal work at the sides is formed from four $\frac{3}{4}$ in. strips, 19in. long, bent as shown in the diagram (Fig. 6), in the usual manner of bent ironwork: The small lower curved strips are $7\frac{1}{2}$ in. and similarly bent up. Rivet the long and short strips together at X, and also fasten the lower ends to the column of the lamp and the tops to the

top of the shade. A $\frac{1}{2}$ in. wood washer, 2 $\frac{1}{2}$ in. in diameter, and placed between the bottom of the shade and the top of the column will raise the former slightly and make it quite rigid.

How to Finish.

Oak is the best wood to use for this standard, stained down to the required shade, and finished with Lightning Polish. The staining and polishing should be done before the shade and the ornamental metal work are fixed. To the interior of the lamp glue plain parchment or stencil paper, so a diffused light will be thrown out.

Finally the flex is brought up from the base, through the column to the lamp at the top.

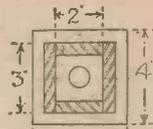


Fig. 1.—A plan of the standard.



Fig. 2.—A flat side view.

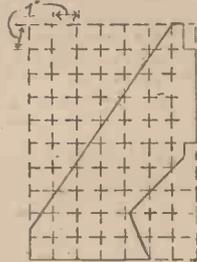


Fig. 3.—How to mark out the feet.

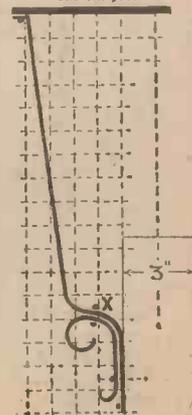
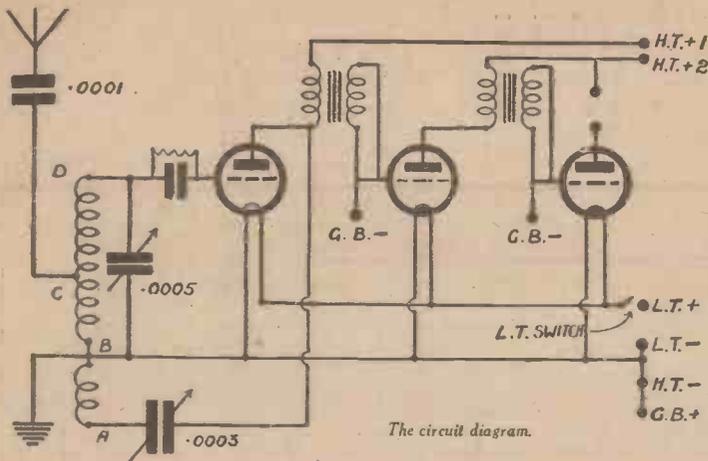


Fig. 6.—The shape of the metal supports.



THE set we are about to describe is probably the cheapest 3-valver ever produced, and yet it is in no way a freak. Standard parts are used throughout, the coil being the only component which has to be constructed. This is of so simple a design, however, that it is practically impossible for the amateur to go wrong.

One feature of the set which will be of particular appeal, especially to the novice, is that the bugbear of soldering is entirely eliminated. All the connections are taken direct to the terminals on the various components. Another point worthy of note is the general compactness of the layout. This has been carefully studied, with the result that the whole of the "works" are accommodated on a baseboard 12in. by 7in. with an over-all height of only 4½in. This feature will, of course, be appreciated when it comes to making a cabinet, as the cost will be considerably less than that of most sets of this type.

The Circuit.

The circuit used is a straight three, employing detector and two L.F. stages. Special attention has been paid to selectivity, but at the same time it gives excellent volume.

The prices given in the list of components are those current at the time of writing. Where more than one make is given the price of the lowest is quoted. A certain amount of discretion should be used when making purchases, however, as the retail price of some wireless parts seems to vary considerably with different dealers. You will naturally buy in the cheapest market.

Winding the Coil.

First of all you must wind the coil. For this you will need an impregnated cardboard or Paxolin former 3½in. long and 2in. diameter, together with about 1oz. of 26-gauge D.S.C. wire. Make two small holes about ¼in. from one end of the former and thread the end of the wire through them, leaving about 8in. for connecting purposes. Now wind on 15 turns of wire and make another two holes. This time thread the wire through double in the form of a loop. This loop is left for connection and the wiring continued in the same direction for another 15 turns. At the end of the second 15 turns a loop is brought out as before, but this time a space of ¼in. is left before continuing with the third

OUR REALLY EFFICIENT

Build the "Economy Three," "Hobbies"! It can be constructed at a cost of the average one-valver.

section, which consists of 45 turns. The coil is now completed by once more threading the wire through two holes. Leave an end about 8in. long for connecting purposes as at the beginning.

The Layout.

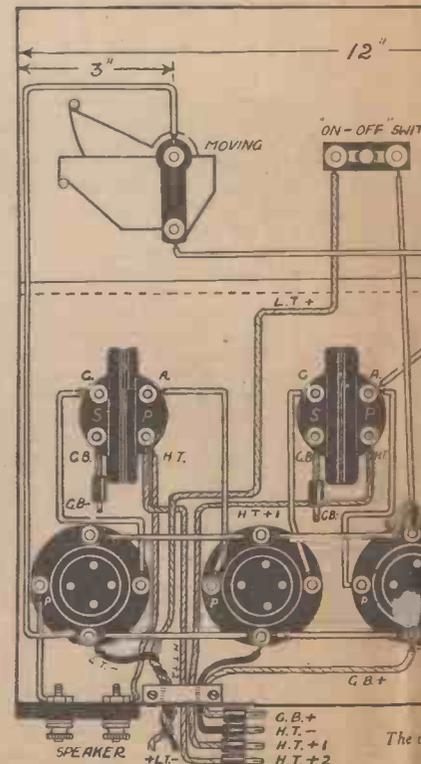
The next job is to mark out and drill the panel. The diameter of the holes is ¼in. Next cut out the baseboard, which should preferably be of 5-ply wood, but American white wood or mahogany are quite suitable. Fix the panel to the baseboard with two brackets. Now mount the two variable condensers and the "on-off" switch on the panel. These should be fixed in position first and then the other components arranged on the baseboard. Make sure that these latter are nicely spaced before finally screwing them down. The coil may be secured by gluing a strip across the inside of the bottom end of the former. This strip is then screwed to the baseboard.

The Transformers.

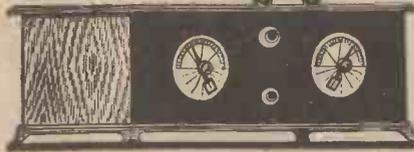
While on the subject of the layout, we must say a word or two about the transformers. Those used in the original set were the small type "Dario," obtained from Messrs. J. and M. Stone Lighting Supplies Ltd., of 303, Southampton Street, S.E.15. Besides being efficient, they are very compact, and were chosen as much for that reason as for their extremely low price. Should you prefer to use a larger type, however, such as the "Stal," you may find it necessary to move them a little

LIST OF COMPONENTS

2 L.F. transformers (Dario, Stal) at 2s.	
1 .0005 var. condenser (J. & M. Stone)	
1 .0003 reaction condenser (Telsen)	
3 valve holders (J. & M. Stone Lighting)	
1 .0002 condenser and 3 meg. leak (Telsen)	
1 "on-off" switch (Ready-Rad)	
4 Eclax terminals (Eclax Products) at 1s.	
Wire for coil	
Former approx.	
Panel	
Base approx.	
1 .0001 fixed condenser (Telsen)	
Flex. 3 yards, at 1d. per yard	
Screws	
Connecting wire approx.	
6 wander plugs at 1d.	



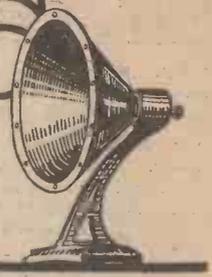
"Hobbies" Radio Expert gives you some useful information and replies to your queries.



WIRELESS

EFFICIENT HOME-MADE COILS

A second article on this subject will appear next week.—Ed.



WHEN we come down to brass tacks, we have to admit that there really are not many radio components that can be made at home, and yet can be guaranteed to give results equal to those expected from the factory-produced article.

We can almost count them on the fingers of one hand; yet the "finger of honour," so to speak, must certainly be given to our friend the inductance coil.

Here is unlimited scope for one's ingenuity and patience, with a reward at the end. And that reward is the fact that a well-made coil, even if turned out with the help of nothing more ambitious than a pair of pliers and a screwdriver, can be just as efficient as the best that can be bought.

The Basket-weaver Coil.

The first type of coil I propose to describe is known as the "basket-weave" variety. It should not be confused with the basket coil, generally wound on cardboard. The "basket-weave" coil is self-supporting, very easy to make, and probably the most efficient of all.

It was introduced by an American amateur some years ago, when the "low-loss" craze was at its height, and it became deservedly popular, though it seems to have disappeared for a while.

Fig. 1 shows the only "apparatus" necessary. This is a circular wooden block, 2½ in. in diameter (to standardize the turn numbers), round the edge of one flat surface of which are a number of nails. These nails should be driven in ¼ in. from the circumference, and should be equally spaced. For the purpose of this article we will take it that there are eleven of them, although you may use any number that is not divisible by 2 or 3.

The best way to space out these nails evenly is to draw a circle of 2 in. diameter, concentric, of course, with the circumference of the block. If you then mark the positions for your nails, just under ¼ in. apart, starting from any given point, you will find them practically regular.

If you like to operate with a protractor and draw angles of 33 degrees all round you will be still more accurate.

Knock the nails in sufficiently hard to prevent them from bending inward under pressure, but not so hard that they cannot be extracted.

Winding the Coil.

The actual winding is simple. Take the end of your wire, twist it round any given nail, and go off round the circle as follows. Take it inside the second nail, outside the third, inside the fourth, and so on. When you have got back to the starting point you will find the second

turn naturally goes outside the nail that it was previously inside, and, when you have continued for ten turns or so, you will see a very business-like coil coming to life.

On reaching the desired number of turns, simply bind the coil round with cotton in six places (it is best to tie the cotton round the "thin" portions where two sets of turns cross—that is, midway between any two nails), pluck the nails out, and the coil is complete. The ends are simply twisted once round the nearest nail.

Reference to Fig. 2 will show the general idea and, roughly, the appearance of the finished coil.

Previously I said that the number of nails must not be a multiple of three. This is because it is possible to make an even neater coil, as a "de luxe" job, by taking your wire inside two nails, outside the next one, inside two again, outside one once more, and so on. You may experiment with various methods of winding, since these slight alterations will not seriously affect the turn numbers given in the table further on.

These "basket-weave" coils are particularly suitable for short-wave work, since no two adjacent turns are really concentric. Any turn is only touching its next-door neighbours at the points that were half-way between the nails when the winding was being carried out. In the case of the first type, concentric turns are spaced from each other by one other turn, and, with the second type, we have three different kinds of turns before we return to the first one made.

The "Sub-100-Metre" Coil.

Now for more detailed particulars. For wavelengths above 100 metres, the coils will be rigid enough with No. 22 D.C.C.

wire. Naturally D.S.C. may be used, but it hardly warrants the extra expense. For the "sub-100-metre" coils, No. 18 should be used, since they have few turns and are not too rigid otherwise. Further, the use of thick wire has the desirable effect of increasing the spacing between turns.

The following table gives a rough indication of the turn numbers required for various ranges. It is made out for a .0005 condenser above 100 metres, and a .0001 below:—

Turns.	Wavelength-Range.
2	8-14 metres.
5	13-27 metres.
9	25-42 metres.
12	30-60 metres.
18	55-125 metres.
25	100-180 metres.
50	160-400 metres.
75	220-560 metres.
100	360-740 metres.

(Continued on page 95.)

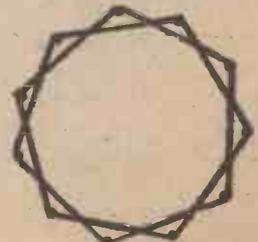


Fig. 2.—The finished coil.

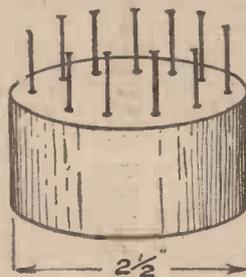


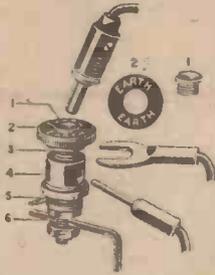
Fig. 1.—The wooden block and nails for making a basket-weave coil.

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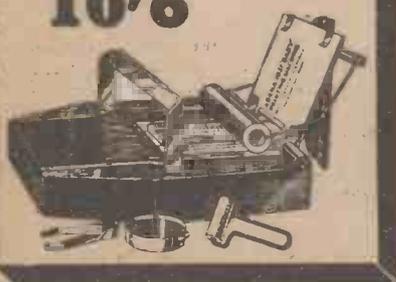
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PHOTOGRAPHY

How to Take
Stereoscopic Pictures.
BY OWEN WHEELER.

Mark all envelopes containing queries with the word "Photography" in the top left-hand corner.

IN HOBBIES for July 18th, readers were shown how to make a stereoscope. Stereoscopic photographs can be bought pretty cheaply, but it is, of course, much more interesting to make them oneself, and, while it is not quite as simple and easy as ordinary snapshot work, it is well within the capacity of anyone who will take the trouble to understand what stereoscopy means, and the care needed to fulfil its requirements.

What Stereoscopy Is.

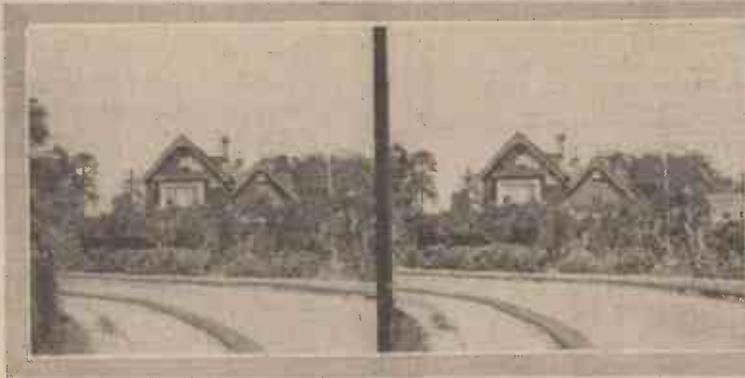
The trouble with an ordinary photograph, apart from the lack of colour, is that it differs from what we see with our eyes in being flat. It has length and breadth, but no depth, such as the eye perceives in a solid object like an orange, for instance. If you want to get a really true picture of an orange, showing it not only round but standing out in bold relief, you must imitate the action of human vision in which the two eyes view one object from slightly different angles, the views being combined to form one which is fuller and in more perfect relief than either of the separate ones. If you first shut one eye, next open that and shut the other, and then open both eyes, you will get a very fair idea of what is known as the Binocular Parallax. It will sound a little less terrifying, perhaps, if, with the Chief Scout's permission, we call it the B.P. In order to get the B.P. effect in photography you must take two photographs of the same scene or object from different angles, and then combine these in a stereoscope. This, as you saw from the HOBBIES article quoted in my first sentence, is an instrument fitted with two lenses at the same distance apart as human eyes, which blend the two photographs into one and make the different objects in the picture stand out in wonderful relief.

Stereoscopic Cameras.
You can make stereoscopic photographs with an ordinary camera by boring two-holes, large enough to admit a tripod screw and 6in. or 7in. apart, in a board about 10in. by 4in. by ½in. Between these two holes bore a third, and fit it with a tripod bush, which you can get for a few pence from any photographic dealer. Fix the board firmly to a tripod stand, and arrange the latter

so that the length of the board faces your object. Now fix your camera to the right-hand hole, focus, and expose. Take off the camera, transfer to the left hand hole and expose again, taking care that your lens is pointed in the same direction as in the first instance. This you can generally ensure by drawing a pencil line on the board along the side of your camera base before transferring from the first hole, and making this line a guide for the second photograph.

A Worthwhile Hobby.

But, if you are going in at all seriously for stereoscopic work—which is a very interesting and well "worthwhile" hobby—you will find it much more satisfactory, either to buy a stereoscopic camera, or to convert an ordinary half-plate camera into one as described in the next paragraph. Regular stereoscopic cameras have two chambers, each of which is practically a little camera with its own separate lens, but both pictures are taken on the same plate or section of roll film. In some models there are actually two



A typical example of a stereoscopic photograph.

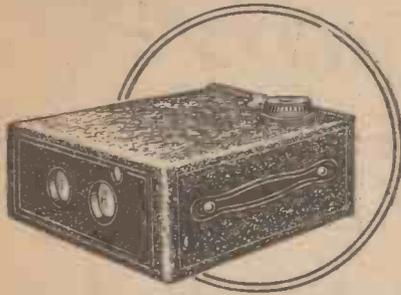
separate bellows, but it is more usual to have one bellows with a partition which expands and contracts in accord with the camera extension.

Stereoscopic Sizes.

The "standard" stereoscopic size is 6½in. by 3½in. and, if you draw a rectangle this size, divide it into two halves, find the centre of each half, and measure the distance between the two centres, you will find it to be between 3¼in. and 3½in., which is about the separation of two average human eyes. But you can get quite near enough to it by taking your two photographs on a half-plate (6½in. by 4½in.) and, if you want a stereo outfit which is both serviceable and cheap, you cannot do better than buy secondhand a single-extension square-form half-plate camera, and either fit it yourself, or get your dealer to have it fitted, with the necessary expanding partition. The latter should preferably, of course, be detachable so that, if you wish, you can use the camera for ordinary half-plate pictures. Stereo cameras are made in smaller sizes than the standard, and very beautiful little instruments some of them are. But the

pictures taken with them cannot be viewed in standard stereoscopes unless the latter are provided with adjustable eye-

pieces, and even then not always satisfactorily.



The camera used for taking stereoscopic photographs.

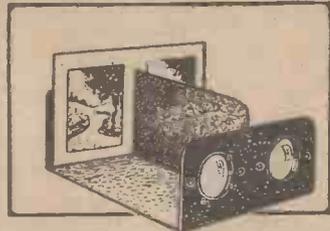
You can make stereo pictures with a single lens mounted on a long sliding panel, which enables the two exposures to be made successively by bringing the lens opposite first to one half of the plate and then to the other half. But it is more satisfactory to have two separate lenses of exactly the same focal length, with which simultaneous exposures can be given to each section of the plate or film. The "pairing" of lenses for stereoscopic work is an optician's job, and is usually done by the makers, in whose catalogues you will often see a quotation for pairing lenses—as a rule about five shillings. The focal length of the lenses is very important. It depends upon the distance they are separated on the panel front of the camera, or, you can put it the other way and say that the separation of the lenses depends upon their focal length. For stereoscopic pictures taken with a half-plate camera, the separation being 3½ in., the focal length should be about 4½ in.

For simultaneous exposures which are not absolutely

instantaneous, you can manage by connecting the caps of your two lenses by a bar. But it is preferable to have a stereoscopic shutter operating both lenses, and, if of the roller-blind variety, it need not be very expensive.

In printing from negatives intended to be viewed in the stereoscope it is necessary to transpose the two pictures, i.e., to make the right-hand picture the left-hand one. There are printing-frames which enable this to be done without any cutting, and they are certainly very convenient, but rather expensive. However, it is no great matter, after having made your print, to trim it carefully, cut it in halves, and mount the transposed pictures. This is absolutely necessary, as otherwise you will have a false stereoscopic effect. There should be a separation of ¼ in. to ⅓ in. between the two mounted pictures.

In conclusion it may be mentioned that it is possible now to buy for a guinea a stereoscopic roll-film camera and viewer, made by a very well-known firm, with which excellent results in a small size can be obtained with the minimum of trouble. The apparatus in question is a "T. P." production, turned out, that is to say, by the Thornton-Pickard Manufacturing Co., whose cameras and shutters are of world-wide repute, and it can be bought through any dealer. It is called the T.P. Stereo Puck and takes any 3½ in. by 2½ in. 8-exposure spool.



Two photographs shown in position on a stereoscope.

L	O	P	U	N	R	O	O	T
A	R	A	B	S	E	L	L	A
I	D	L	E	D	A	D	D	Y
N		A	S	A	R	E		
J	E	T	T	I	A	R	C	
L	A	E	A	S	L	O		
A	P	A	R	T	R	E	A	M
D	A	D	I	R	A	N	E	
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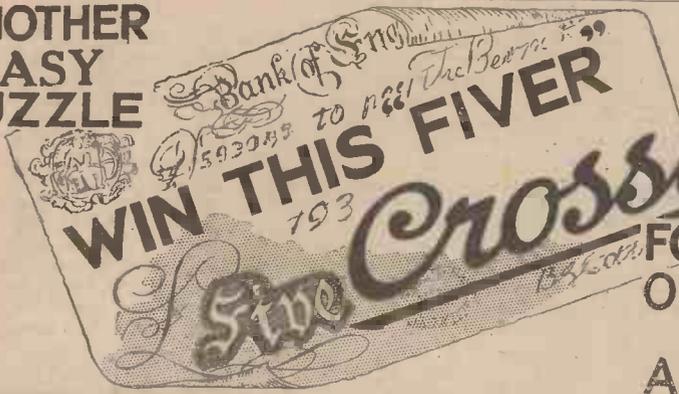
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9				E	L	I			10		
			11		A		12				
E	13	M				14				15	
	16	17		18			19				
20				21	22					23	
			24	R	E	F	T		25	26	
27	28					29					
							L				
30				31					32		

1	S	O	U	S		4	5	6			
7		R		A					8	E	T
9				E	L	I			10		
			11		A		12				
E	13	M				14				15	
	16	17		18			19				
20				21	22					23	
			24	R	E	F	T		25	26	
27	28					29					
							L				
30				31					32		

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ACROSS.

- French coins.
- To exchange.
- Take a part.
- Neuter pronoun.
- A bluejacket.
- One who wears anything.
- A vagrant.
- As well.
- Yes.
- Cook in a frying-pan.
- A silly fellow.
- The ocean.
- A notion.
- Warning signal.
- Behold!
- Boy's name.
- Tiny.

CLUES.

DOWN.

- This tapers to a point.
- A grassy plant.
- Animals seen on a farm.
- A woman's garment.
- Plural of "I."
- A pod vegetable.
- To catch.
- A salver.
- Periods.
- To spoil.
- Myself.
- Musical instrument.
- A doll.
- To disappoint.
- Remain.
- Renown.
- Organ of hearing.
- A toothed tool.
- Before.
- Achieve.

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HOBBIES.

PIGEON RACING is always increasing in popularity, and the number of homer pigeons kept is now very large. The King, like some of his poorest subjects, has a loft, and the pigeon Derby draws an entry of some hundreds of first-class birds. As a hobby the sport is delightful, and not the least interesting part about it is the training of the birds. The training cannot begin at too early an age. As soon as a bird can support itself on its wings the work may begin. Muscular development is of great importance, and this should be produced as the bird grows and matures. For my own part I like the evening best for the training. The air resistance is then nearing its lowest ebb. It is, moreover, the time of the day when the bird feels the homing instinct most strongly. If it is out of the question to train in the evening, then the early morning is the next most suitable time. The work does not take long even when one is keeping a large number of birds. At first do not take the youngster more than a quarter of a mile, if so far, and about a quarter of an hour before the evening meal is given. Hold it loosely and stroke it as you carry it from the loft to where you intend to liberate it, and do not make any noise when you let it go. Place it on the palm of the left hand; don't throw it into the air. It is not a bad plan to let it be accompanied by an older bird, say, one of its parents. Give it a daily flight until it is six months old. The flights then may be decreased to one or two a week, though, as with race

TRAINING A HOMER PIGEON

By J. G. Bristow Noble

horses, the more regular exercise the birds have the more fit they keep. But in the case of the majority of pigeon keepers it is difficult to find time to keep more than a certain number of all in their lofts exercised oftener than this. It is rather a business to take all out at one time.

The youngsters soon thoroughly enjoy the spins and do their best to reach home ahead of their companions. In a short time the flights may be lengthened to a mile or so and then to any reasonable distance. The exercise the birds get in the loft and on the roof of your home will be found enough to keep them in good health, but it is not enough to keep them in the condition successful racing demands. When on a long flight the birds rush through the air without discretion, and if not in first-rate condition they are likely to be lost. They may fall dead from exhaustion, or, not being able to get farther than a certain distance, they may be stolen. Cleanliness is also of importance. The lofts must be kept as clean as possible. They should be swept out every week-end and lime-washed once a month. Good and correct feeding is another thing to be particular about. The best food are peas, and as a change, wheat, tares and sprouted-oats. The food should be placed in clean, earthenware vessels, not on the floor of the loft. It should also be watched that the loft is kept free of mice. One or two will prevent the birds from sleeping and cause them to go out of condition.

WIRELESS (continued from page 90).

Please note that these figures cannot possibly be taken as exact, as so much depends upon the actual type of set with which they are used, particularly the layout of the components. The figures given are for use when the coil is a closed circuit, without an aerial tapped on to it. The aerial should, in any case, be loosely coupled by means of another coil, in these enlightened days!

A Reaction Receiver.

Where the coils are to be used in a reaction receiver, it is well to make the whole set once only, and it will usually be found that for a given coil in the grid circuit, the next smaller coil will serve for reaction.

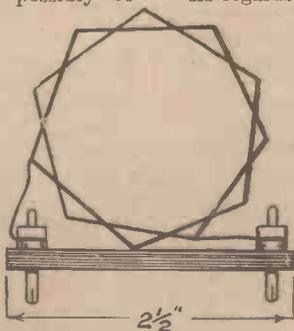


Fig. 3.—The coil mounted on a strip of ebonite.

As regards the mounting of the coils, tie them down to a strip of ebonite with a plug at each end, as shown in Fig. 3. This makes quite a rigid job for experimental purposes, and the wide spacing between the plugs makes for greater efficiency than one generally associates with two-pin coil mounting.

If it is not desired to use a series of plug-in coils, naturally one large basket-weave coil may be wound, and tappings brought out at the necessary places. For this purpose it is best to give the wire an outward twist where it takes a turn round one of the nails. The loop formed may be bared afterwards, and connection made by a crocodile clip in the usual way.

THREE NEW BOOKS

THE name of Sid G. Hedges is familiar to readers of **HOBBIES**. He is, of course, well-known as an authority on swimming, but besides that he knows a great deal about indoor games. Now, also, he is blossoming into a popular writer of detective novels. Three new books by him have just appeared.

"The Pendlecliffe Swimmers" (Sheldon Press, 3s. 6d.), is a bumper volume which will form an ideal Christmas present for any boy or girl interested in swimming. It is a gripping story of school life, in which the hero, Jakeman, sets out to bring back the enthusiasm for swimming which Pendlecliffe has lost. Jakeman is a magnificent swimmer, and a whole text-book full of technical swimming description is scattered through the tale.

"More Games for Socials" (National Sunday School Union, 1s.). This is a companion volume to "Games

for Socials." If you would like fresh games and stunts to brighten your Christmas and New Year parties then let your bookseller get you a copy of this at once. Mr. Hedges describes in this new little book about 120 games. You need never have a dull party or social gathering again. The section headings give some idea of the contents: Ice-Breaker Games, Moving-About Games, Sitting-Still Games, Musical Games, Surprise Games, Spectator Games, Brain-Test Games, Team Games.

"The Channel Tunnel Mystery" (Herbert Jenkins, 7s. 6d.). A wealthy newspaper-owner, who has strongly supported the Channel Tunnel scheme, disappears. His car is found wrecked between Folkestone and Dover. A strong murder mystery rapidly develops, with plenty of thrills. The setting alternates between England and France.

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A fine packet of all different stamps containing the new 1931 issue of Abyssinia, a large pictorial Ruanda-Urundi. Another 1931 issue, large pictorial, Japan Earthquake Stamp, Albania 1880 pictorial, a fine set of 3 Dutch West Indies, Kouang-Tcheou, Lebanon pictorial, Monaco, Cameroons, Caylon, etc., free to all asking to see my famous approval sheets and enclosing 2d. for postage and packing (abroad 3d.). Albums 1/4, 1/10, 3/4, 6/4, 7/6, 10/4 upwards.—S. HAMMOND, 2, Chesham Fields, Bury.

SALE and EXCHANGE

Advertisements are accepted for this column at the rate of 4d. per word, prepaid. Address communications to the Advertisement Manager, "Hobbies," Southampton Street, Strand, London, W.C.2.

CINEMATOGRAPH FILMS, Machines, Accessories. Lists Free. Sample Films, 1s.—Filmicals, 57, Lancaster Road, Leytonstone.

PATENTING INVENTIONS.—Handbook free.—King's Patent Agency, Ltd., Wardrobe Chambers, E.C.4.

FRETWOOD of all kinds. Superior to plywood. Planed both sides. Beautifully figured. Free from knots and shakes. Also cheap parcels.—Write for list, Hobbies Ltd., Dereham, Norfolk.

BUILD OWN GRAMOPHONE. Save pounds! Instructions 3d. Gramophones, Motors, Fittings, Records, Lists Free. Cash or terms.—H. Burt, 185, High St., Deptford, S.E.5.

HAVE A FACTORY at home with Hobbies fret machine. From 3s. upwards—ready to use. Makes money in your spare time. Cuts wood and metal for all kinds of jobs. Try one at any Hobbies branch.—Free illustrated list from Hobbies Ltd., Dereham, Norfolk.

GRAMOPHONE Fittings.—Wholesale prices, 64-page catalogue, "How make Gramophones," 3d.—Regenthol, 120, Old Street, London.

ALL SMALL FITTINGS for the handyman. Hinges, knobs, hooks, bolts, locks, etc. Reliable and cheap. Call at Hobbies Branches or send requirements to Hobbies Ltd., Dereham, Norfolk.

MAKE MONEY Picture Framing, Tray and Furniture Making. Fully illustrated list and Guide Post Free 6d.—Watkins Provider, Exchange Works, Newport, Mon.

NEW DESIGNS in Flash Steam Boilers. Model Catalogue now ready.—Bolsover Brothers, 55, Castle Rd., Whitby.

STAMPS.

FREE! 25 Unused Colonials to genuine applicants for approvals. Send 1½d. postage. Hodder, 34, Second Avenue, London, W.10.

SUPER DOUBLE-MAGNET LOUD SPEAKER

ONLY 2/6 DOWN

GET IT ON APPROVAL



The latest and most improved type of Classic and Cone, complete with 4-pole Balanced Armature Adjustable Unit, ready to fit into any cabinet. The double magnets are of specially prepared Tungstam Steel, and the richness and volume of the deep bass reproduction is comparable with the best moving coil reproduction. Nothing nearly so good has ever before been offered at such a remarkably low price. SEND ONLY 2/6 and get it on approval.

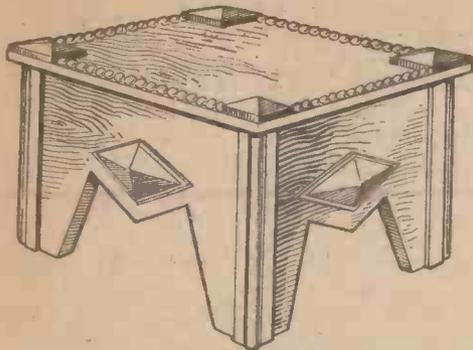
Our new "DE LUXE" Speaker with extra special 4-pole Unit fitted inside or outside chassis, on approval for 2s. 6d. If satisfied, complete purchase by 7 monthly payments of 5/-. (Cash Price 35/-) In ordering be sure to state "SUPER" or "DE LUXE" as required.

If satisfied, complete purchase by five monthly payments of 5/-. No extra for packing and postage. Cash price 25/-.

E. J. HERAUD (Dept. H.2), NUMBER ONE, EDMONTON, LONDON, N.18. Established 32 years. Branches: 78-82, Fore St., Edmonton; 77, West Green Rd., Tottenham; 34, St. James's St., Walthamstow; and 139, Hertford Rd., Enfield Wash.

SUBSCRIPTION RATES.

"Hobbies" will be forwarded by post to any reader at the following prepaid rates: Twelve months, 13/-; Six months, 6/6; Three months, 3/3. Registered at the G.P.O. for transmission by Canadian Magazine Post.



A SIMPLE FLOWER BOWL STAND

Make a point along the bottom edge $\frac{1}{8}$ in. from each corner, and another point $2\frac{1}{2}$ in. up on the centre line. Lay a rule from the points on the bottom edge to the points of the diamond and draw lines. Draw two more lines to meet these from the point $2\frac{1}{2}$ in. up on the centre line and parallel with the sides of the diamond.

Get the Stand Square.

One side being cut, it is quite simple to mark off the other three from this and cut out in the usual manner. Be quite sure you keep all sides parallel in order to make the stand square when fitted into the moulding. The four diamonds, one on each side, are now glued in position as already stated, and then the sides put together by gluing them into the corner moulding.

A top is required (see Fig. 2), cut from wood $\frac{1}{2}$ in. thick and 9 in. square. Polish the surface and edges of the top when cut, and then fix a raised wood ornament (No. 212), on each corner of the top surface. Finally, fix strips of $\frac{1}{8}$ in. half round beading (No. 52) along

HERE is quite an attractive stand suitable for a flower bowl or small plant pot for indoors. The article is easy to make, the work of construction being simplified by the use of the Hobbies' grooved corner moulding. First of all you will need four pieces of corner moulding 6 in. long with the ends cut square. The moulding for this article needs grooves of $\frac{1}{8}$ in., and this is obtained from Hobbies Ltd. (No. 45). To make the work of cutting the ends quite square, it is best to use a mitre block. If you do not already possess a block with a right-angle cutting guide, you will do well to invest in one of Hobbies.

Having cut the four pieces of moulding 6 in. long, the next thing to get along with is the sides of the stand. The general appearance of the sides is shown in the illustration of the finished stand, and details of the sides are given in Fig. 1. The thickness of the wood for the sides is $\frac{3}{8}$ in., to fit into the grooves in the moulding, and an inspection of Hobbies' catalogue will reveal a choice of wood suitable for the stand, but as the ornaments recommended are in oak it is best to complete the whole thing in this wood.

Marking the Work.

When you have got the materials to commence work, first cut a piece of the wood $7\frac{1}{2}$ in. by 6 in. Mark a centre line down the board and a line at right-angles to it $2\frac{1}{2}$ in. from the top edge, as shown in Fig. 1. At this stage mention is made that four plain raised diamond ornaments (No. 207) are required, and the position for these is indicated by the dotted lines. Mark off the position on the wood, and then it is a simple matter to mark the shape of the remainder.

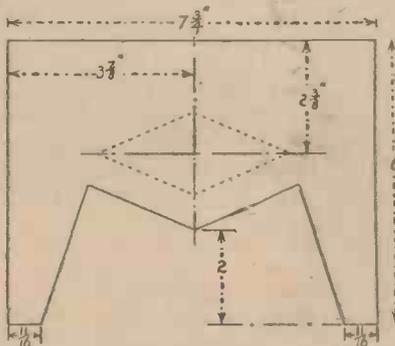


Fig. 1.—How to mark out one side.

the edges between the ornaments as shown in Fig. 2. The top, when finished, is fixed in position with the aid of a little glue applied along the top of the corner moulding and top edges of the sides. Take care to get the top fixed on centrally, so that the edges overlap the sides evenly all round. The whole of the surface is given a final rub over with fine grade sandpaper and then coated with stain and polished.

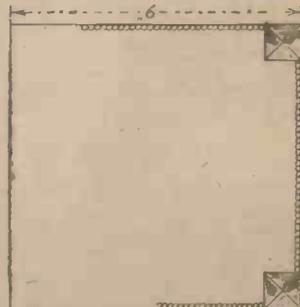
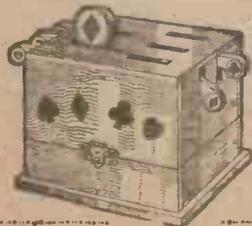


Fig. 2.—The size of the top and its decorations.

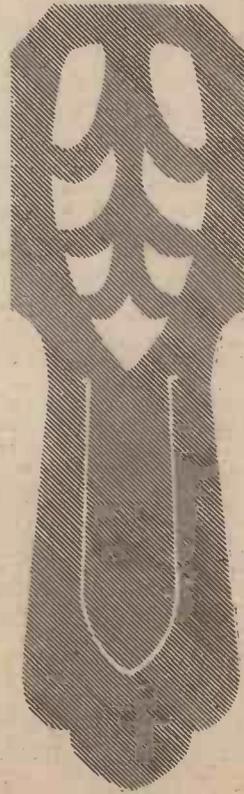
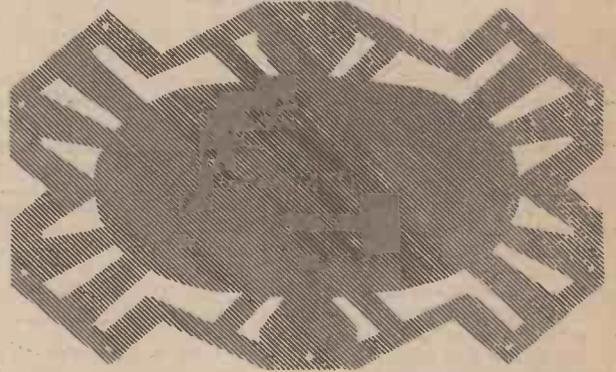
The patterns for this NOVEL TRUMP INDICATOR

free with next week's issue.



FINGER PLATES AND BOOK MARKS

A little time ago we had an article on cutting metal with the fretsaw. The outlines given here are suggestions for articles carried out in metal or in thin plywood, or even ivory or xylonite. The large pattern is for a finger plate for a door, the one just below is for a decoration to a cabinet or box, whilst the two smaller ones at the bottom are book marks. All are easily cut with a fine fretsaw and fixed where required with tiny fretnails through the holes shown on the drawings.



THEN—

PRESENTATION DESIGN WITH THIS NUMBER.



For Amateurs of Both Sexes.

VOL. 1. No. 1. Oct. 19, 1895. ONE PENNY.

Fretworking and Inlaying in Wood.
Photography for Amateurs.
Hobbies that Pay.
Stamps and Stamp Collecting.
The Magic Lantern, and how to make the Slides.
bazaars and how to Decorate them.
An Electric Seal Pin.
Cycling, Football, and Athletics.
Decorative Use of Waste Material.—Mosaic.
Venetian Ribbon or Bent Iron Work.
Weekly Presentation Design.
Prize Competitions, Correspondence, Etc.

ABOUT OURSELVES

A brief survey of our beginning and development

By the Editor

ON October 16th, 1895, was published the very first issue of HOBBIES. You will see on this page a reproduction of the first cover. It was in black and white, and, compared with modern issues, looks a trifle flat. That very fact, I think, indicates the progressive policy we have always adopted, for thirty-six years ago, the process of photographic illustration was practically unknown; it did not come into general use

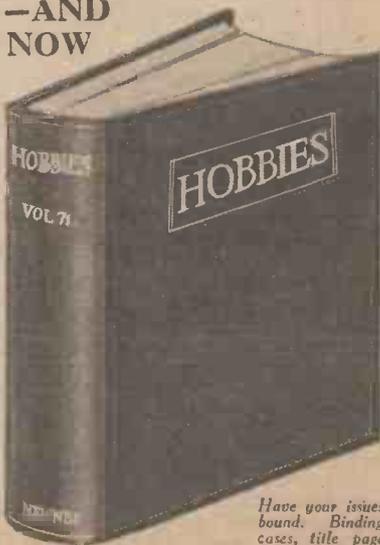
During the War, the then Editor of the paper formed a toy association, the objects of which were to encourage a form of industry which had been long in existence in Germany, Bavaria, and Switzerland, namely, the making of toys in the home. The early issues of the paper contained articles on botany and natural history, and even one on how to fold dinner napkins. Mr. F. T. Bidlake, doyen of cyclists and cycling journalists, was writing for the paper in 1913 and in that year Mr. G. H. Westwood contributed a series on model aeroplanes. The fretwork design has always been a popular feature.

The issues covering the War period reflect the mentality and atmosphere of the times in many of the features and the models. For example, Mr. Gillie Potter, well-known to every listener, contributed a short play to our issue No. 1,000, dated December 12th, 1914, entitled "The Secret Code," a tale of the Great War in two scenes. Complete instructions were given for staging and playing it, as well as hints on successful make-up, and playing "The Secret Code" for the National Relief Fund, of which the Prince of Wales was President. This play brought a letter from the Secretary of the fund thanking the Editor for his efforts.

With the restriction of paper, the issue came down to sixteen pages during one period. Many readers were in the Services, of course, and interesting extracts from letters were published from time to time. Before the War the late Mons. Antonini introduced to HOBBIES the antofret system of fretwork. He was an Italian priest, and the system consisted of bevel cutting into a single piece of wood so that when the cut-out piece was pushed up it had an overlaid, and in some cases, a carved appearance. At one period in our history sections were devoted to hobbies of special interest to ladies and girls.

At another period fiction was introduced, but neither proved popular and the features were discontinued. It would be impossible in a short survey of this kind thoroughly to review the entire contents of our seventy-two volumes, but sufficient has been said to indicate the immense popularity enjoyed by the paper. It is with extreme pleasure that we are able to record that this continues.

—AND NOW



Have your issues bound. Binding cases, title page and index cost, for

vol. 72 (from issues dated April 4th, to Sept. 26th) 2/9 (by post 3/-). Indexes separately cost 4d.

until about four years later. It is, therefore, worth recording that HOBBIES was one of the first journals to adopt what was then a new illustrative process. In point of fact, all illustrations in those days were executed by one of two processes—by lithography (a process we still use for reproducing our fretwork designs), and by woodcut, a laborious process of copying all drawings on to boxwood and chipping away that part of the surface which was not required to take the ink. Thirty-six years is a long time, for not every paper can claim to have stood four-square to the adverse conditions encompassed by that period. HOBBIES was the first paper solely devoted to hobbies, and although to have been first can, in some cases merely indicate antiquity, it does, in our case, also bear witness to the fact that we have become first. The fathers of many of you who read this took and read HOBBIES when they were boys, and the fact that the first generation continues to do so is an invigorating and stimulating influence on those of us behind the scenes whose pleasure it is to supply you with practical instructions in all the arts and crafts. The paper had its early difficulties, of course. No. 1, for example, was edited in a disused railway carriage near the site upon which now stands the great sawmills of Hobbies Ltd. In point of fact, three old railway carriages were formed into three sides of a square; very soon, of course, a more imposing building had been completed.

HOBBIES has been a leader in every new field of practical thought and scientific discoveries—the bicycle, the gramophone, the aeroplane, wireless, as each new era came along, bringing in its train a new hobby with thousands of followers, we supplied them, in language devoid of technical jargon and Patent Office patois, with practical instructions on the new subject. You will see from the illustration that fretwork, stamps, photography are features which have been continued without a break ever since No. 1 of HOBBIES. In 1897 a weekly journal entitled "Live Stock Hobbies" was started which dealt with birds, beasts, insects, etc.



Why's and Replis

QUERIES AND REPLIS

Let Your Editor Help You. Address your letters and queries to The Editor, "Hobbies," Geo. Newnes, Ltd., 8-11, Southampton Street, Strand, London, W.C.2., enclosing a stamped, addressed envelope. All letters and queries must bear the full name and address of the sender.

"Austin" and "Vauxhall" Competitions.

THERE is still time to enter for our Austin and Vauxhall model-making competitions, the rules governing which were set forth in our issues dated October 3rd and 10th respectively. The former contains our free gift set of parts for making a splendid model of the Austin Seven, and the latter a design sheet for the Vauxhall car. These issues are obtainable from the Back Number Department, Exeter Street, Strand, W.C.2.

Title-Page and Index to Vol. 72.

HOW quickly time flies! It seemed but yesterday that I wrote a paragraph concerning the index and title-page to Vol. 71. I am reminded of this by the fact that we have now published an eight-page title-page and index for Vol. 72; copies of this index are obtainable for 4d. separately, or complete with binding case for 2s. 9d., from newsgagents, or for 3s. by post from us. A bound volume of HOBBIES constitutes an encyclopædia of practical arts and crafts, and the very full index enables you rapidly to locate the piece of information you want.

The "Hobbies Telescope."

It is with great pleasure that I inform readers that Mr. E. W. Twining, a model-maker and art craftsman of considerable experience and versatility, has joined our staff of contributors. Mr. Twining will make his debut in these pages next week with the first of a series of articles explaining how to make the Hobbies Astronomical Telescope. I have the drawings of this telescope before me now, and I can assure my readers that it is a really clever and at the same time easily-constructed piece of work. It is not a toy, for it has a barrel 33ins. long and 3½ins. bore.

Mr. Twining has had long experience in every branch of model-making, including model aeroplanes (he won several important competitions in

the early days of model aeroplanes), model locomotives, telescopes, architectural models, etc. If you add to this wealth of experience his accomplished style of writing and his skill as a draughtsman, you will appreciate that his contributions are something worth looking forward to. By means of his telescope you will be able to observe the heavenly bodies with the same degree of accuracy as the skilled astronomer.

NEXT WEEK.

**DESIGNS
FOR ATTRACTIVE
TRUMP INDICATOR
FUN WITH
FIREWORKS
MAKING
WIRELESS COILS
HOW TO BECOME
A VENTRILOQUIST
MAKING A
TABLE POND**

Stamps, Electrics, Model Aeroplane Topics, Model Railways, Coins, Etc., Etc.

These articles Mr. Twining will follow up with articles on other subjects.

Our Christmas Number.

WITHIN a few weeks my Christmas Number will be in your hands. It has been the subject of careful consideration for many weeks past, and I think I have now arrived at the correct proportions of its ingredients. It will be an *enlarged* Christmas Number, and its contents will be directed towards entertainment as well as practical things.

Aqua Regia Correction.

In our issue dated Oct. 3rd, page 28, we wrongly stated that Chlorine is called Aqua Regia. This latter substance is really a mixture of hydrochloric acid and nitric acid.

A Request for Tram Tickets.

Ralph Kendrick, Junior, 28, Nelson Street, Rochdale Road, Manchester, would like to hear from other readers who have for disposal unused or used tram and 'bus tickets, and pictures and photographs of trams and 'buses, as his hobby is making as complete a collection as possible.

Making Firework Fuses.

Make a saturated solution of saltpetre in water, C. L. C. (Westminster); then dip thin blue tissue paper in same, roll it up into the fuse shape and allow to dry thoroughly.

Colouring Electric Light Bulbs.

Electric light bulbs are frequently coloured by the application of a coloured spirit varnish obtainable from the larger oil and colour stores, L. W. H. (West Kilburn). It should be applied quickly with a soft brush, and it dries in about half an hour.

Mountant for Photographs.

Add a little water for one ounce of dextrine break it up with a teaspoon, then add a wine-glassful of water, W. H. (Sheffield); stir over the fire until it boils and when cold it is ready for use.

Black Liquid Polish for Leather.

Take 4oz. of isinglass or gelatine, 4oz. of powdered indigo, 4oz. of soft soap, 4oz. of logwood, and 5oz. of glue. L. N. (Llandudno). Boil in 2pt. of vinegar until the glue is dissolved, then strain through a cloth and bottle for use.

The First Bible.

The first Bible was printed by Gutenberg between 1450 and 1455. Gutenberg was, of course, the first printer.

Wax for Artificial Flowers.

Heat together equal quantities of wax (as used for best white wax candles) and white lead in a vessel in an oven; regulate the stiffness by using more or less wax, M. D. (Halifax).

Frame Aerial Data.

The following information regarding frame aerials is given in reply to L. G. (Bridport):

Length of Side of Square Frame.	Number of Turns.	Space between Wires.	Inductance (Microhenries).	Self-capacity (Microfarads).	Natural Wavelength in Metres.
8ft.	3	½ in.	96	75	160
6 "	4	¾ "	124	66	170
4 "	6	1 "	154	55	175
3 "	8	1 ½ "	193	49	185

Varnish Hint.

Streakiness in the varnish, L. J. (Leicester), may be caused by the imperfect mixing of driers, oil, or turpentine with the varnish. When it appears on unpainted wood, it may be due to uneven planing or filling-up. Very often an extra coat of varnish will put the thing right.

HOBBIES LTD.

BRANCHES AND AGENCIES.

Below are the addresses where Hobbies goods can be purchased. In addition all leading stores and ironmongers stock or can obtain your requirements in ironwork and woodwork, designs, wood, turned legs, moulding, polish, wireless accessories, etc., etc.

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- LEEDS . . . 10 QUEEN VICTORIA STREET.
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- BRIGHTON . . . 68 LONDON ROAD.
- CANADA . . . 844 YONGE STREET, TORONTO.

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- Aberdeen.—Jas. Mutch, Ltd., 47 Broad Street; Bedford.—Messrs. T. S. Carpenter & Co., 105 Midland Road; Blackburn.—Mr. H. Mercer, 65 Darwen Street; Bradford.—Messrs. T. Underwood & Co., 13 and 15 Manchester Road; Cambridge.—Mr. H. S. Driver, 28, Hills Road; Canterbury.—Mr. T. D. Goodman, 33 Burgate Street and 16 St. George's Street; Cardiff.—J. Halls (Tools), Ltd., 31 Morgan Arcade; Croydon.—L. H. Turtle, Ltd., 6 Crown Hill; Dover.—Mr. E. F. Bockham, Queen's Gardens; Dublin.—Mr. J. J. McQuillan, 36 Capel Street; Dundee.—Mr. J. Philp, 45 Murray Gate; Folkestone.—Mr. W. Allsworth, 16 & 18, Guildhall Street; Hastings.—Mr. W. H. Mozley, 4 York Buildings; Hull.—Mr. O. F. Walker, 17 & 18 George Street; Leicester.—Mr. Frank Berry, 3 Loseby Lane; Liverpool.—Mr. C. Lucas, 35 Manchester Street; London.—Messrs. H. Osman, 166 Aldersgate Street, E.C.; Newport, Mon.—J. Halls (Tools) Ltd., 81, High Street; Reading.—Mr. W. J. Sargent, 44 West Street; Swansea.—J. Halls (Tools), Ltd., 2 Gower Street; Wigan.—Mr. Thomas J. S. Clephan, 22 Standishgate; York.—Messrs. J. H. Shouksmith & Sons, 132 Micklegate.

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Chisels that cut—Saws that saw
—Hammers that don't flatten out
—They are the tools an amateur wants but doesn't get in a cheap foreign set. Hobbies Carpentry Sets can be relied upon to give service and contain only practical tools fit for any workman.



No. 1 Outfit.
Just the thing for the handyman.
Contains 10 in. Handsaw, Warrington Pattern Hammer, 6 in. Chisel, Screwdriver, 2 ft. Folding Rule, Bradawl, Gimlet and Carpenter's Pencil.

Price 7/6
Postage 9d.

Other Outfits 11/6, 27/6, 29/6, and 45/-

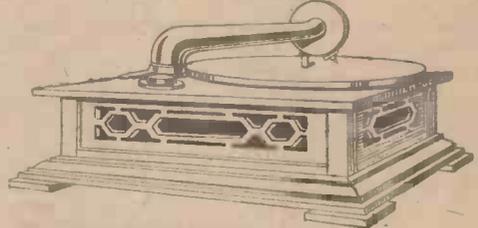
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A full-size playing instrument, built in Mahogany with the fretsaw. Can be made in very short time from the wood and fittings supplied. Design No. 1699, Price 4d., or 4d., post free. A parcel of planed mahogany, with moulding, the motor and gramophone accessories as illustrated.

Carriage 1/0

27/6

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4/3

A UKULELE

Design No. 156 Special. Price 6d. Post Free 7d.
Designs for making a full size instrument. A parcel of selected mahogany, padouk and instrument pine, set of strings and pegs and a 20-page handbook how to play.

Post 6d.

4/-

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A specially shaped neck, suitable for either of the above designs, cut and finished ready to fit supplied for 1/9 or 2/- post free.

A ONE STRING JAPANESE FIDDLE

This parcel includes special parts of beech (for the neck), pine, and selected wood for all parts required. The necessary key and "E" string, a bow, and an instruction manual how to play the instrument.

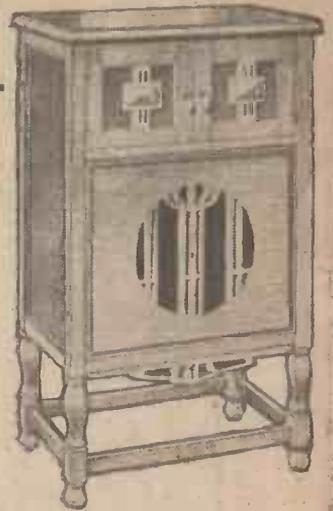
Design No. 768. Price 4d. 7/9 Post 6d.

Obtainable from Hobbies Ltd., Dereham, Norfolk, or from any of their branches in London, Glasgow, Manchester, Birmingham, Sheffield, Leeds, Southampton, Brighton.



HOME-MADE WIRELESS for the amateur.

The reader of Hobbies can make all his own parts for wireless to say nothing of earning pocket money, by doing something for your friends when they want it. New sets, new cabinets, fronts, speakers, etc., can all be built by the handyman from these parts and designs which Hobbies supply.



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A handsome cabinet in oak with double-door space for set and speaker beneath. Stands 3ft. high. Set for space 18in. by 8in. by 11in. deep. Complete kit of wood, turned legs, hinges, knobs, edging, etc., for 31/6 or 34s. carriage paid. Design of patterns (No. 152 Special), price 1/- (post 1d.).



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A modern set specially planned for the home constructor. Three-valve set in an easy-to-make mahogany cabinet. Reasonable in cost. Wonderful selectivity, and volume. Chart and all particulars for 6d., post free.

A SPECIAL WIRELESS TABLE

This practical table built in mahogany for 17/6 and 2/11 extra for hinges, lock, etc. A handsome piece of furniture. Legs ready grooved for the sides. Double door cabinet for batteries, etc. Top measures 23in. by 14in. Any home carpenter can make it. Design of parts (No. 167 Special), price 9d. (post 1d.).



READY-TO-MAKE CABINETS

Planned boards of mahogany for building these cabinets are supplied complete with illustrated construction chart. In all popular sizes at half usual cost. No. 6 Parcel, panel size, 16in. by 5in., 7/8. No. 9a, panel size, 18in. by 7in., 7/6. No. 10, panel size, 21in. by 7in., 8/9. Postage extra. Complete list, free on application.



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These speakers are easily built with the aid of a few fretwork tools. They cost half shop price, and all materials are supplied ready to cut out. To fit standard types of loudspeaker units.

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Designs printed full size of speaker fronts which can be adapted to any size. Fretted circle is 10in. in diameter. Eight to choose from—4d. each. Those shown are No. 1 (above) and No. 2.



Complete range of Radio Accessories for the handyman is shown in the 1932 Hobbies Catalogue. Over 300 pages. Of any newsagent, price 9d.



In Mahogany. Design No. 1, 8/6, 3d. Wood and accessories 8/-, postage 9d. extra.

Stand's 12in square. Mahogany moulding, etc., 4/6 (post 1d.); Design No. 1, 7/6 3d.

Cone speaker in Mahogany—Wood 5/6 (postage 3d.); Design No. 1, 5/6, 4d. (post 1d.).

ALSO OBTAINABLE BY POST FROM **HOBBIES LTD., DEREHAM, NORFOLK**

Also obtainable through leading ironmongers. Ask for Hobbies wireless accessories.