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Hobbies

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February 7th,
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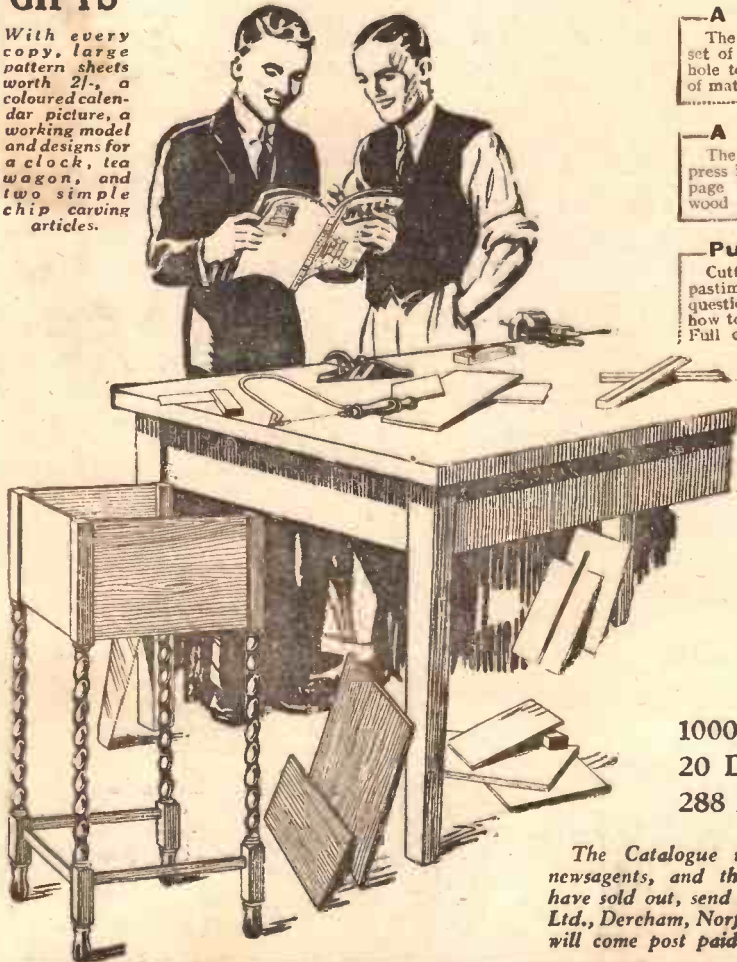
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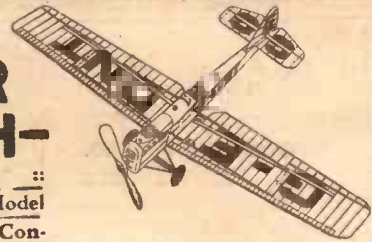
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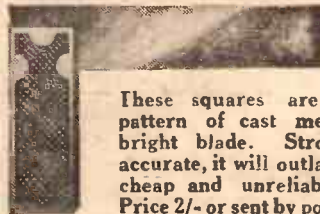
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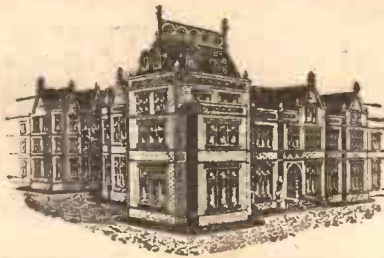
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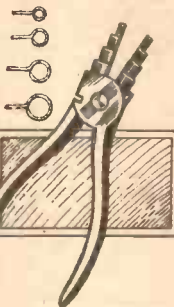
Published Every Wednesday

FEBRUARY 7th, 1931

THIS WEEK'S CLEVER IDEAS

A Special Pair of Pliers.

THE special pair of pliers shown in the illustration on the centre of this page will rapidly and neatly form eyes in the ends of wire, and of a diameter to suit the terminal or bolt they are intended to pass over. Eyes formed with ordinary pliers are seldom neat or satisfactory, nor do they always make good electrical contact. The pliers provide eight standard sizes of loop-forming ends which make perfectly circular loops. These range from $\frac{1}{16}$ in. to $\frac{3}{8}$ in. in diameter. The inner faces of the pliers meet in perfect contact along a line $\frac{1}{16}$ in. in length. The tool may also be used for other small bending jobs. The usual side cutters are incorporated.



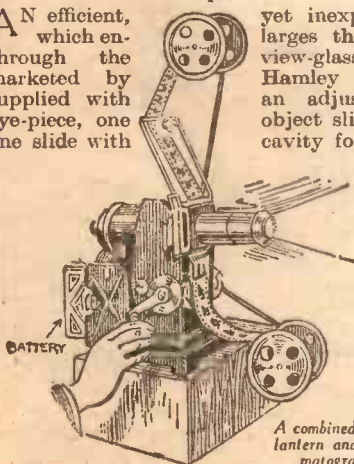
A useful pair of loop-forming pliers.

A Toy Cinematograph.

THE toy cinematograph shown below can be used either as a cinematograph or as a magic lantern. It is lighted by an electric current supplied from an ordinary pocket lamp battery, and is fitted with a good quality lens, a film rewinder, and split spools. It is supplied complete with battery, bulb, four lengths of standard size film in a box, and six magic lantern slides at 9s. 9d. post free, by Hamley Bros., Ltd., 200, Regent Street, W.1.

An Efficient Microscope.

AN efficient, which en- through the marketed by supplied with eye-piece, one one slide with



yet inexpensive microscope enlarges the object fifty times view-glass has just been Hamley Bros., Ltd. It is an adjustable mirror and object slide, one plain slide, cavity for liquids, and one cover glass. As shown, it costs by post 8s., or without stand 3s. 10d.

A Combined Solder and Flux.

A COMBINED solder and flux has recently made its appearance on the market. It is sold in collapsible lead tubes.

A little of the composition is squeezed out on to the job and the soldering-iron is used in the ordinary way.

Ink Capacity of Fountain-Pens.

SOME interesting experiments have lately been made by one of the well-known fountain-pen manufacturers on the ink capacity of a fountain-pen and the number of words it will write. Of course, the number of words depends very largely on the breadth of the nib and the style of the writer as well as on the length of time the pen is left idle in the pocket, during which period the ink is slowly evaporating. Under average conditions it is estimated that a fairly large pen will hold 120 drops of ink and will write about 36,000 words. A midget pen manufactured by the same firm held only one drop of ink, and with this about 200 words could be written.

A Catapult Parachute.

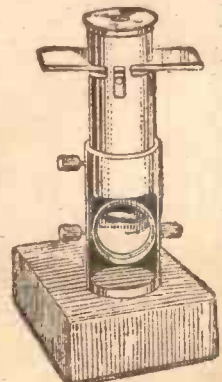
AN interesting novelty recently marketed consists of a strong catapult and a polished aluminium ball containing a 12in. parachute. The ball is shot high into the air, and the parachute then floats gently back to earth.

Penny-in-the-Slot Door-Bell.

AN ingenious door-bell, which has for its object the prevention of calls by beggars, hawkers, and other undesirables, is being marketed. It operates when a coin is dropped into a slot. When the door is opened the coin is returned. The inventor hopes that the necessity for putting in a deposit in this manner will end the nuisance of having to reply to rings from irresponsible people.

The Famous Bowman Models.

IF you will send 3d. in stamps to Bowman Models (Dept. O.O.), Dereham, Norfolk, you will receive a delightful book of Bowman Models which gives details of patent speed boats, double-power locomotives, stationary engines, working models and rolling stock, with full instructions and hints on running.

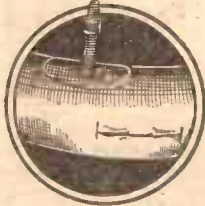


An efficient microscope.

NOTES AND NOTIONS from our READERS

Split Inner Tubes.

IT is usually found that when an inner tube splits it will continue to do so even though a large patch be placed over it.



How to stop a split in an inner tube from spreading.

If, before repairing, each end of the slit is nicked with a pair of scissors to form a letter T, the slit cannot spread, and a sound job will be made of the repair.

A Handy Marking Gauge.

A HANDY marking gauge can be made from an old cotton-reel in the following way: Cut a piece of hard wood such as oak, about 8in. long, so that it fits tightly, but will slide through the cotton-reel when tapped with a mallet. Then fix a gramophone needle about 1/4in. from one end of this piece, and you will have another useful tool to add to your collection.

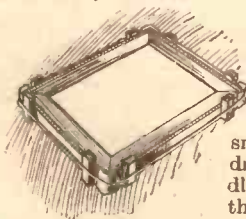


A handy marking gauge.

String Cramp.

THE dodge here shown enables you to hold a picture frame together while the glue sets when cramps are not available. First get eight blocks of wood, and a piece of string, and set this as in the diagram; then move the blocks towards the corners. This will tighten the string; continue to move the moving blocks till the string is tight enough, and when the glue is set, move the blocks away from the corners. It is advisable to put something soft at the corners and also under the blocks to protect the wood of the frame.

An Easily-Made Lathe.



String and blocks of wood used as a cramp.

A PRIMITIVE form of lathe suitable for making small knobs or drawer handles is shown in the sketch. It can be made to almost any size, but for

the particular purpose need not be more than 2ft. long. The wood should be about 2in. by 1in. when planed up,

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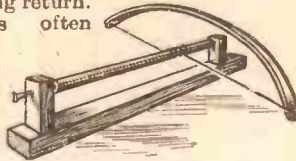
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and the uprights about 4in. long, either tenoned or halved to the base. The screws should be about 4in. long, and must project to provide centres, the ends being filed to remove the gimlet point. The bow should be made of ash or beech, and should be about 3ft. x 3/4in. x 1/2in., the string being ordinary whipcord. A tool rest can be made by clamping a suitable piece of wood to the base.

An Efficient Doorstop.

AN efficient doorstop can be made easily for any door which has a spring return.

It is often found necessary to keep a door like this open.



An easily-made lathe.

This stop does away with the need for wedges, etc., which are easily lost. Get a piece of hard wood (oak) and cut to the shape shown. Nail a piece of rubber round the sloping end. A small block of wood is screwed to the top end of doorstop, and the completed stop is screwed to the bottom of the door in the position shown. A sufficiently large screw and washer should be used; it is also necessary that the stop be screwed tightly. To operate

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it, the foot is placed under the small block and pulled up, thus jamming the rubber-shod end against the floor.

Making Permanent Magnets.

ANY large-sized electro-magnet, operating on a heavy direct current, may be used for making permanent magnets.



An efficient doorstop.

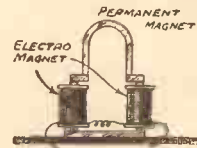
The diagram below shows how the permanent magnets should be placed, one at a time.

It is advisable that the direct current supplied to the large magnets be interrupted rapidly.

Some Uses for Staples.

A HANDY and cheap bolt can be effected on any door with only four staples and a large nail. Two staples are placed in the batten of the door, and two in the doorpost.

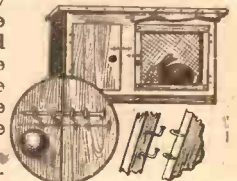
Light doors can easily be hinged by knocking 2 1/2in. nails into the doorpost and bending upwards. On the edge of the door hammer in staples to correspond to the nails and slip on. It forms an excellent hinge.



How to make permanent magnets.

A Useful Drawer Hint.

WHEN opening a drawer one has frequently been annoyed through having accidentally pulled it right out of its case, and in order to prevent this, two strips of wood, about 1 1/4in. wide by 3/8in. thick, can be screwed to the back of the drawer. The strips of wood project about 3/4in. above the drawer back, so that when the drawer is pulled forward they catch against the bearer. By using one screw instead of two in the centre of the strips, the wood can be revolved turn-button-fashion, and the drawer can, at any time, be taken out without the use of a screwdriver.



Some uses for staples.



The grindstone.



The acrobats



The water-mill.

THESE easily constructed toys afford much interest and amusement to both young and old. The most popular model is that in which an acrobat performs upon a trapeze, but there is scope for ingenuity in devising other models, for which I submit two suggestions, viz., the water-mill and the man at the grindstone.

The mechanism is very simple, as will be seen from Fig. 1. A neatly fashioned box of thin wood is the first essential. It may measure 12in. by 9in., with a depth of 2½in.

A sheet of glass will be required to close in the front. This may be secured at the edges with passe-partout strip. When finished the whole thing must be sand-tight.

Fig. 2 shows the box in sectional view. A narrow fillet is run round the inside at about the middle of its depth to carry the sheet of stout card on which the background is painted, and in which the forward primal of the wheel works.

The Sand Reservoir.

Referring to Fig. 1, it will be seen that the sand reservoir is made from a strip of cardboard, and that this strip is continued downwards to make the channel through which the reservoir is refilled when empty, by turning the box round anti-clockwise. This piece of card must have a width exactly equal to that of the space between the back of the box and the cardboard background, so that when the latter is glued in place a glue joint may be made also between it and the reservoir.

A small hole must be made in the centre of the angle that forms the bottom of the reservoir, to allow of a fine stream of sand falling upon the wheel.



Fig. 1.—The sand reservoir.

SAND-OPERATED TOYS
By W. S. Rogers

The Sand Wheel.

Fig 3 shows how the wheel is constructed from cardboard. The left-hand view is as it would appear with one face removed. In the centre is a wooden disc to afford a good fixing for the wire shaft.

The right-hand view shows the bearings, and the collars on the shaft to prevent lateral movement. A small brass plate is let into the wooden back, drilled to take the end of the shaft.

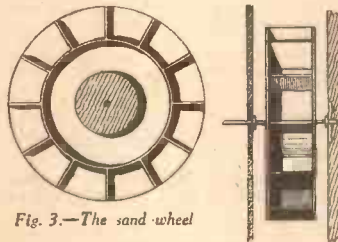


Fig. 3.—The sand wheel

A small amount of lateral play may be allowed to guard against jamming.

As to the figures, these should be copied on to stout Bristol-board and cut out neatly. They may then be coloured to taste.

The Figures.

The acrobat, Fig. 4, should consist of five pieces—the trunk and four limbs. The joints are made with sewing cotton knotted on each side. As the hands have to be separated, a short tube should be made by rolling pasted paper around a piece of the same wire as that used for the shaft. This tube may be ¼in. long. After the figure has been jointed insert the tube between the hands, pass a wire through hands and tube, glue the ends of the tube, and force all together. When dry the wire may be removed. When mounted on its shaft there will be sufficient friction to hold the figure securely to it.

For the stationary figure the same outline may be used, but reversed, re-arranging the arms and legs. When drawn as it has to appear the figure may be cut out in one piece. It should be fixed with small wooden blocks, so



Fig. 2—A sectional view of the box for holding the sand.

After piercing, the hole should be made clean with a hot wire, or it may have fitted in it a short length of small brass tube.

(Continued on page 610.)



ORNAMENTAL WOODEN PICTURE FRAMES

Don't have bare walls in your den. Any fellow can make these pretty frames, with a few bits of wood and the ornaments supplied ready to glue on. A few minutes' work will make the house quite cheerful with these artistic frames.



A SIMPLE method of making ornamental picture and mirror frames is described in this article. The method of making the frames is clearly shown at Fig. 1. Each frame is made with four face rails; the ends of the rails are cut quite square, and simply butt together. Smaller back rails are screwed behind the face rails in such a way that they fix the joints, and also form rebates for the glass, picture, and back. Those shown have openings 1ft. by 1ft. 4in.; the face rails are 2in. wide by $\frac{3}{4}$ in. thick, and fretwood of this thickness should be used, oak being the most suitable kind. Hobbies' supply the necessary fretwood, wooden ornaments, beading, plywood, and glass, cut to certain sizes, for making the frames, particulars being shown in the 1931 Catalogue. In preparing the face rails, which (as before stated) are 2in. wide, care should be taken to see that the side rails run right through, and that the top and bottom rails fit between them, so the end grain will not show at the sides. The ends of the top and bottom rails must be perfectly

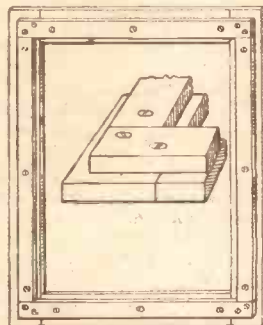


Fig. 1.—The way the frames are made up. The strips on each side hold the fronts together and serve as rebates for the glass and picture. The centre drawing is an enlargement of the corner.

square to make good joints. The back rails are $1\frac{1}{2}$ in. wide, and in this case the top and bottom rails are the longest and the side rails fit between them. In fixing the parts of the frame together, the four face rails are laid front down on the bench, the butt joints are glued, and the top and bottom back rails are fixed with glue and screws.

The method of ornamenting the frames and fixing the glass, picture and back is shown at Fig. 2. The ornamentation at A consists of a wood ornament (No. 226) at each corner, and, in addition, a turned button (No. 218) with smaller buttons (No. 219) on each side are fixed in the middle of each rail. The ornamentation shown at B consists of a raised square ornament (No. 210) at each corner, with strips of half-round ball beading (No. 52) fixed to the edges of the rails. The glass and picture fit in the rebates, as shown at Fig. 3, and a thin plywood back should be fitted behind, with the frames completed with rings and hangers in the usual way.

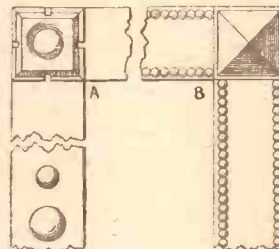
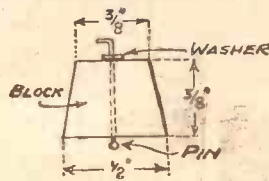
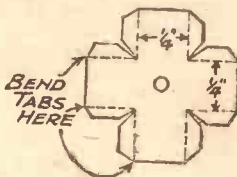


Fig. 2.—Details of the ways the frames are decorated with turned beading and ornaments.

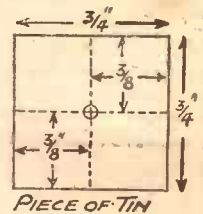
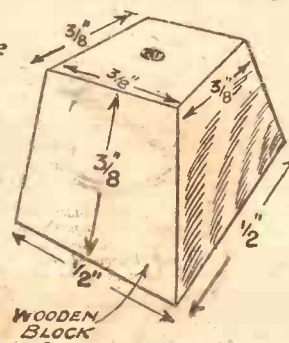


Fig. 3.—A side view of the frame, showing the front, the rail, and the picture and glass held in with a nail.

OUR MODEL AUTOGIRO—Details of the Rotors

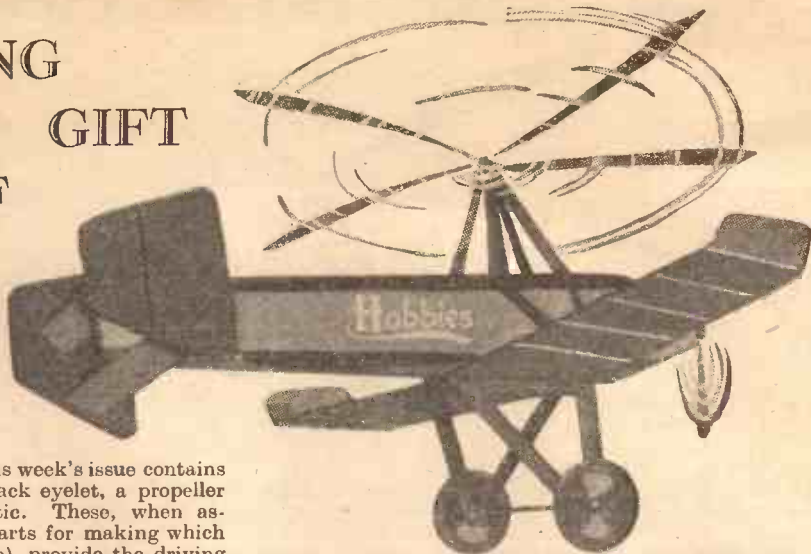


These diagrams explain how to assemble the four cardboard rotor blades on to the pulton. It will be seen that a piece of tin cut to the dimensions shown on the right and to the shape shown in the left-hand corner, grip the four blades in the manner shown in the top left-hand corner. A block of wood shaped as shown here is glued between the pulton; a pin is passed through a hole drilled in the centre of it, a washer is placed over the pin, the assembled rotors are passed over, and the end of the pin is bent back.



COMPLETING OUR FREE GIFT MODEL OF THE AUTOGIRO

By F. J. Camm



THE envelope given with this week's issue contains two propeller blades, a black eyelet, a propeller shaft and a length of elastic. These, when assembled on to the model (the parts for making which were given with last week's issue), provide the driving mechanism to propel it through the air. The sketches at the foot of this page show how the propeller should be assembled.

spread the ends with a pencil and hammer over with the ball end of a hammer, as shown in the sketches.

Assembling the Propeller.

Take the two blades and bend the little tongues on the end of each at right-angles to the blade itself. Bend one up and the other down, and slide each into the slots provided in the blades.

Pull on each end of the propeller so that the tongues slide back into the bottoms of the two slots, so bringing the two centre holes for the eyelet into alignment.

Now pass the propeller shaft between the two blades from the straight side of the propeller so that the eye in the end of the shaft corresponds with the holes in the two blades. Next press the eyelet through the centre,

NEXT WEEK!
**HOW THE FULL-SIZE
AUTOGIRO WORKS**

Bending the Blades.

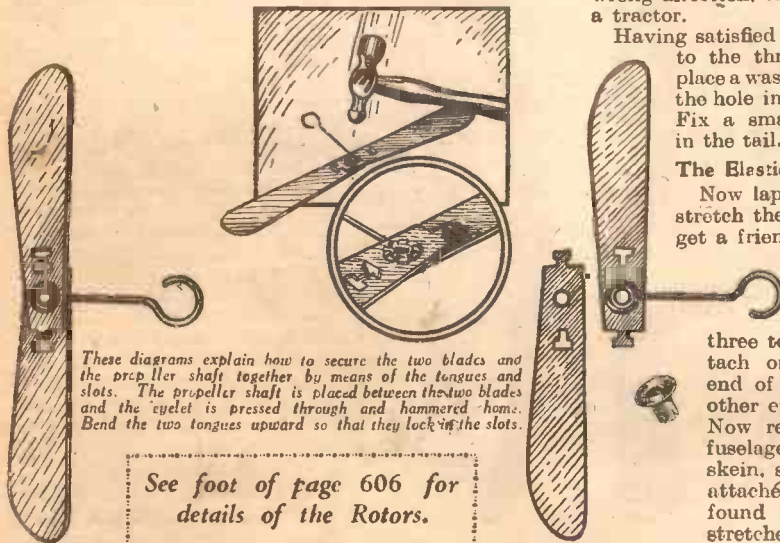
This tractor propeller is made of vulcanized fibre, and may be bent cold, no steaming being necessary. Bend each blade so that the propeller takes on the shape shown in the three photographs on the next page,

and see that each blade is bent the same amount. The curved edges of the blades are bent towards the shaft, not the straight edges towards the curved ones. You can check the bending of the propeller by twirling it between the fingers and viewing the blades. Set the shaft so that the blades revolve at right-angles to it; don't make the mistake of bending the blades in the wrong direction, for it will then be a pusher screw, not a tractor.

Having satisfied yourself that the propeller conforms to the three photographs on the next page, place a washer over the shaft and pass it through the hole in the nose piece described last week. Fix a small hook into the packing piece fixed in the tail.

The Elastic.

Now lap the ends of the elastic together and stretch them, and whilst they are so stretched get a friend to bind them round two or three times with thread, securely knotting the ends of the thread. This will provide you with a loop of elastic which should be folded into three to make a skein of six strands. Attach one end of this skein to the hooked end of the propeller shaft and drop the other end of the skein through the fuselage. Now reach with a button-hook inside the fuselage and pull out the other ends of the skein, slip them over the hook previously attached to the wooden tailpiece. It will be found that the elastic will be slightly stretched, and when the button-hook



These diagrams explain how to secure the two blades and the propeller shaft together by means of the tongues and slots. The propeller shaft is placed between the two blades and the eyelet is pressed through and hammered home. Bend the two tongues upward so that they lock in the slots.

See foot of page 606 for details of the Rotors.



A close-up of the real autogiro. Note the rotors and the extremely practical lines on which the machine is designed. In the near future the autogiro system will replace existing aeroplanes. An interesting article on the full-size autogiro will appear next week.

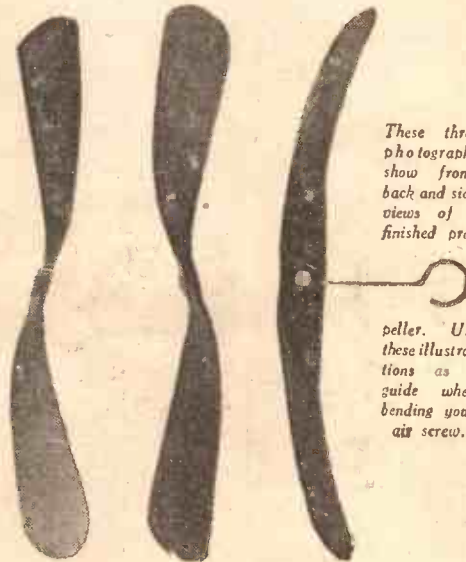
is released the wooden tailpiece will click into place.

The Rotors.

The four rotor blades are assembled on to a piece of tin cut to the shape shown in the sketches at the foot of page 606. The top of the pylon should be packed with a piece of wood, through which a pin is passed from underneath. Over this pin slip a bead or a tiny washer, and then pass the four rotors (assembled on the tin piece) on to the end of the pin, bending the end of the latter over to prevent the rotor from coming off. Next, bend each rotor so that the blades are set to an angle—in other words, bend each blade so that in effect the rotor becomes a four-bladed propeller. In the full-size Autogiro these rotor blades are in effect aerofoils of small width hinged at their attachment to the pylon head to allow freedom of movement in both the vertical or flapping plane, and the horizontal or rotational plane. In this cardboard model, of course, this rotor will not have the effect which the designers of the full-sized Autogiro have achieved. But the model will simulate its action if it is carefully adjusted. See that the rotors spin freely, and when the model is launched the slip stream from the propeller will turn them. It is also necessary to incline the rotors from the vertical; about three degrees should be sufficient. They will not spin if they are set truly at right-angles to the vertical axis.

A Trial Run.

We are now ready to make a trial flight. Lubricate the elastic with pure soft soap, obtainable from the chemist, and smear some Vaseline over the bearings. Then wind up the air-screw in the correct direction, which is such that when you hold the model and let the propeller unwind air is driven towards the tail. Now hold the model above the head and gently thrust the model forward into the air; do not throw it. If everything is correctly adjusted it should fly on an even keel with the rotors spinning in a most realistic way. If it tends to swerve either to the right or the left, set the rudders to counteract it; if the model tends to ascend very steeply it will be necessary to move the mainplanes back. This may be done by carefully lifting them from the fuselage with a penknife and re-gluing them. Similarly, if the model tends to dive steeply the plane must be moved forward. The full number of turns which the elastic skein will stand is two hundred, which should not be applied at the first trial flight. Start with fifty turns and gradually work up to the full number. Frequently lubricate the elastic and the bearings. If, after following these instructions, you find that the model still fails to fly, you have only to address a letter to the Editor and advice will be immediately forthcoming.



These three photographs show front, back and side views of a finished pro-

PELLER. Use these illustrations as a guide when bending your air screw.

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A PENDULUM HARMONOGRAPH

By S. J. Garratt

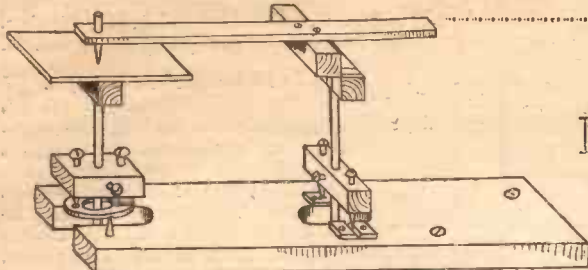


Fig. 1.—The completed instrument.

THE harmono-low combines plicated curves and regularity. matic repetition makes marvel. The number of that can be probable, in fact, it possible to get apparatus is quite and it is most

graph described be-the motions of two to produce com-of great beauty and the auto-of these curves lous patterns. different patterns duced is incalcul- is in practice, im-two alike. The simple to make fascinating to illustrated herewith

watch a pattern such as those growing quite quickly before one's eyes; the illustrations each took about one minute to produce, and though it seems almost incredible at first sight, each of them is made by one continuous line.

The Designs.

The complete instrument is shown in Fig. 1. The pendulum carrying the small table at its top end is mounted on gimbal bearings which allow it to move in any direction, so that it is able to swing in circles, ellipses, or straight lines. The second pendulum operates a pencil or stylus

on the end of a hinged arm, and moves to and fro in a straight line only, just like a clock pendulum.

Commence construction by making the base board as shown in Fig. 2. It is intended that this should be screwed on to a firm table or bench, but be sure that there is no "ricketiness" about the support or the results obtained will probably show wobbly, irregular lines. Screw clamps can be used if it is not permissible to put screws into the bench or table. The two points are supports for the gimbal ring—they are ordinary wood screws with a few threads filed off and the remaining part filed to a nice point. Two small iron plates about 1/4 in. thick are screwed down one on each side of the elongated hole, to carry the pencil pendulum; one plate is recessed with the point of a drill and the other has a V-groove filed across it.

The Gimbal Ring.

This is simply an iron washer about 1/4 in. thick and 2 in. to 2 1/2 in. diameter—the hole should be about 1 1/4 in. to 1 1/2 in. diameter; you will probably have to file the hole out if you use a standard washer. Make a recess with the point of a drill and diametrically opposite to the recess file a V-groove. Then turn the ring over and do the same on the other side, but be sure to make the groove and recess on one side on a line at right angles to those on the other (see Fig. 3). Do not try other (see Fig. 3). Do not try arrangement described is much simple and better—

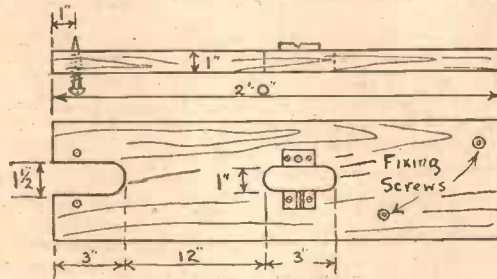
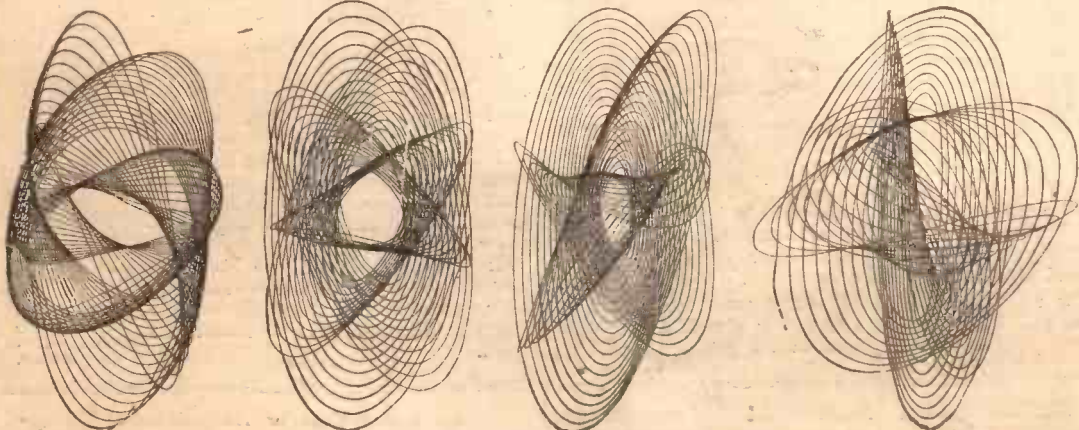


Fig. 2.—The base-board.



The designs shown here were made with a pendulum harmonograph.

unless the knife-edge bearing is made with great accuracy.

The Pendulum.

It is all made of wood except the weight, which is simply a length of very stout lead pipe weighing about 1½ lbs., fixed with a single wood screw (see Fig. 4). If you find it more convenient to use any other form of weight make sure that it is rigidly attached to the pendulum rod; if it can wobble about it will probably spoil the results.

The pencil pendulum is shown in Fig. 5. The arm for the pencil may be attached by a couple of small brass hinges if you prefer it, but

the paper or tape hinges shown will probably give better results as they are almost frictionless and free from rattle.

The apparatus can now be assembled for trial. Put the pencil pendulum weight about halfway up the rod, and the other weight at the bottom for a start, and try any other positions you like after. You can make a few trials with pencil and paper first, using a fine pointed pencil; adjust the pressure on the pencil by arranging a small weight on the arm—putting it on one side of the fulcrum will, of course, increase the pressure and on the

other side will reduce it. Set the pendulums swinging, drop the pencil on to the paper gently and watch results.

Smoked Glass for the Designs.

Although pencil and paper are suggested for a trial, far better results can be obtained by using glass smoked in the flame of a candle, the line being scratched with the point of a needle. The needle should be pushed eye-end first into a piece of wood equal in size to a pencil, allowing only about ¼ in. of point to protrude. The illustrations to this article were produced in this manner, and photographic prints were then made from the smoked glass diagram, which was used like a negative in an enlarger. Although the illustrations are thickened up

somewhat in reproduction, they are still much finer than can be obtained with a pencil. The needle, too, causes much less friction than a pencil, for the slightest pressure is sufficient for the needle while that

on the pencil is considerable and this causes the pendulums to die down quicker.

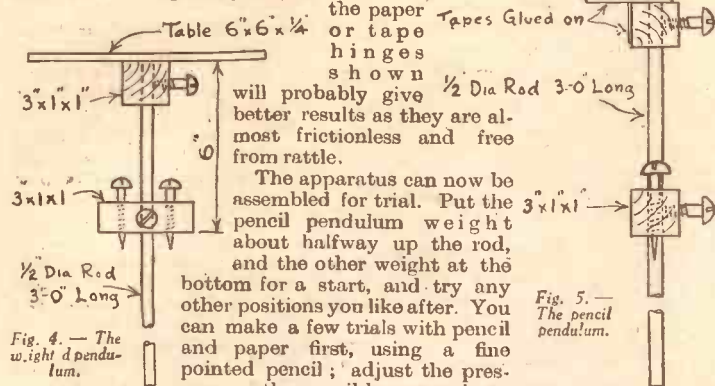


Fig. 4. - The weight pendulum.

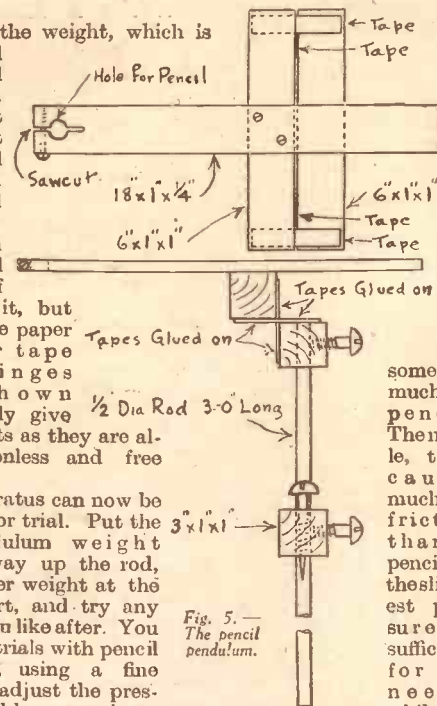


Fig. 5. - The pencil pendulum.

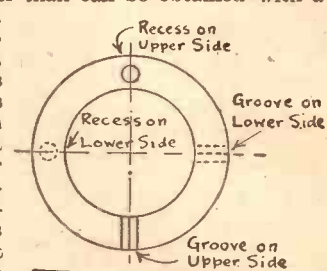


Fig. 3. - The gimbal rings.

SAND-OPERATED TOYS (continued from page 605).

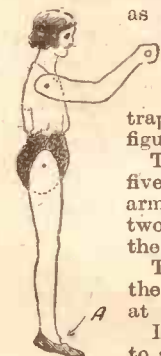


Fig. 1. - The acrobat.

as to stand about midway between the background and the glass.

A round notch (see A, Fig. 4) should be cut in the instep of one foot of the movable figure. This hitches on to the trapeze from time to time and varies the figure's evolutions.

The man, Fig. 5, also should consist of five separate pieces, the trunk, the right arm, the left arm in two pieces and the two legs in one piece, the joint being at the hips.

The right hand connects with the crank of the grindstone, and the left hand is fixed at a point where a tool would be held.

In this case the shaft must be long enough to admit of its fore end being bent to form the grindstone crank handle.

The man's feet may have a strip of ground attached, as shown in the half-tone illustration.

The running of the sand wheel must be tested, in all cases, before the background is glued in place, as, unless quite free, it may jam with a grain of sand.

The Water Wheel and Grindstone.

The water wheel, which, it should be noted, is under-shot, and the grindstone, both must rotate clockwise, so that in arranging the internal mechanism the sand wheel must be set more to the left than shown in Fig 1, to allow the stream of sand to impinge on its right-hand side.

Build up the water wheel from cardboard with floats complete, and set forward that part of the foreground that comes in front of it, to allow the necessary space for the wheel.

Before closing in, fill the reservoir with clean silver sand that has been passed through fine wire gauze or muslin to exclude all large particles.

If the outside of the box be covered with Rexine, the material may be brought forward at the front and turned over to secure the glass.



Fig. 5. - How to make the man who turns the grindstone.

IMPORTANT NOTICE! All correspondence intended for the Editor or Advertisement Manager MUST be addressed to "Hobbies," Messrs. George Newnes, Ltd., 8-11, Southampton Street, Strand, W.C.2

MORE ABOUT LAMP SHADE MAKING

By

B. Debenham

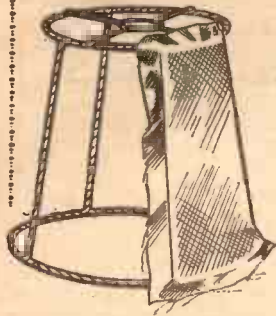


Fig. 2.—Covering the frame with crepe paper.

BEFORE choosing your shape, the first thing to decide is how much light you want. In the case of a pedestal, the bottom of the shade

or the fringe is usually level with the lamp base, for the light from this ornamental type is not usually needed for reading. Greater care is needed in the choosing of a shape for a table lamp, for it is most distressing, after creating an artistic triumph, to find you have plunged the room in semi-darkness. If it is intended to light the room the top should be left open, but if it only needs to flood the table, it should be almost or entirely covered. An important point to remember, in the case of reading lights, is that they should always be lined with white or cream. If this detracts from the colour-scheme, an inter-lining of the right tone will put matters right.

How to Begin.

Having chosen your shape, the first operation—if you are making a crepe-paper shade—is to wrap all the wires of the frame with strips of paper of the colour on which you have decided for your inner lining. You must cut the strips across the grain about half an inch in width. It is best to wrap the upright wires first, and be sure to secure the ends with glue or paste. Stretch the paper as tightly as possible all through the wrapping process—you will find it is extremely strong. Be careful, when wiring the top and bottom wires, to pass the strip round and behind the upright wires so that the joins are beautifully neat.

Use Photographic Paste.

The lining must be fitted before the ornamental cover. Cut your sections a little larger than required in every way and stretch them thoroughly. Cover each section alternately, first pasting the wires. Always use dry photographic paste. Any other is inclined to cockle the paper. Tighten the crepe paper smoothly on to its section, and do not allow the faintest suspicion of a crease. Then trim off the surplus, and if there are any rough edges, use a little more paste, and press them over the wires. Having completed the lining, repeat the process for the outside cover, and remember the grain should always be up or down, and never across, unless you have chosen a very curved shape.

Pleated Shades.

Pleated shades are very beautiful, and it is quite easy to make them look as if they had been imported straight from Paris. They can have a design, which looks all the richer for being pleated, or they can look magnificent in a plain colour, with brilliantly-ornamented edges. If a plain-coloured shade is decided upon, the paper should be stretched to its utmost. Then comes the pasting,

which should be confined to one section at a time. The material for this shade should allow two inches more than the height of the shade and one and a half times the distance of the lower edge of the frame.

The pleats should be fitted to the lower edge first and drawn up straight and taut to the top, where they must be fastened very tightly. Be careful to measure the allowance for each section first. If an accordion-pleated shade is desired, enough material two and a half times the width of the lower edge of the frame is needed, and the usual two inches more than the height. Passe-partout binding should be pasted across the top and bottom and the pleats may be $\frac{1}{2}$ in. to an inch in width, according to the space desired between them. If a patterned crepe is to be used for a pleated shade, it must not be stretched, as this would distort the design.



Fig. 1.—Binding the wires with paper.

NEXT WEEK.

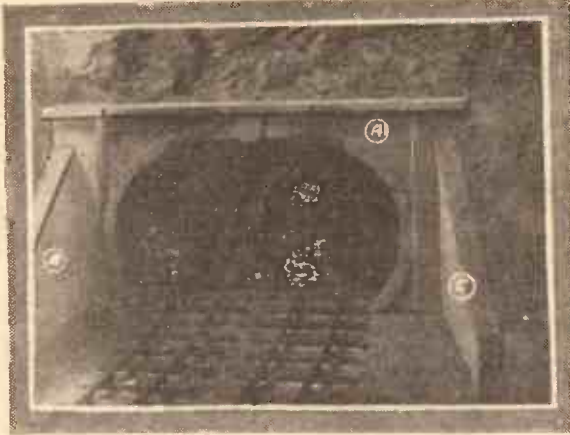
How To Make

A BILLIARD TABLE.

would need to be thonged with raffia or gold galon. The eyelets for this should be punched very evenly. Reeve's lampshade tinting colours are excellent for parchment. For crepe paper shades use wax that has been dissolved in methylated spirits. These waxes, in every conceivable shade, may be obtained very cheaply, and also every other material needed for crepe paper shades. The waxes should be broken into small pieces and put in a jar with barely enough spirit to cover them. Cover the jar and leave it until the wax is dissolved, when it should be the consistency of cream. It should be applied evenly with a flat, wide brush, and designs should be painted after the general surface has dried. If a design is to be appliquéd, however, it should be pasted before the wax is applied, and a finer brush should be used to outline the design. When designs are pasted on, they should afterwards be painted with transparent wax to seal them to the shade, otherwise they may peel off with the heat.

Easy and Charming Designs.

There is a wealth of choice in appliqué designs. Parrots and flowers in paper look as if they are embroidered in the most brilliant of silks. For an Oriental room there are jewelled Chinese medallions of great beauty. Little folk are catered for with nursery rhymes and most life-like and fluffy animals. For the austere, there is nothing nicer than white parchment, with delicate black silhouettes dancing round the shade.



TUNNELS FOR MODEL RAILWAYS

By H. Greenly

Fig. 1.—A tunnel mouth showing the three main parts.

being smothered over with a coating of thin glue (or size) and sprinkled with sand, chicken-grit, and chopped-up dried moss while the glue is still wet.

Setting Out Tunnel Entrances.

The tunnel portals must be of more solid construction, and in the matter of design these entrances afford scope for unlimited skill and ingenuity on the part of the model engineer.

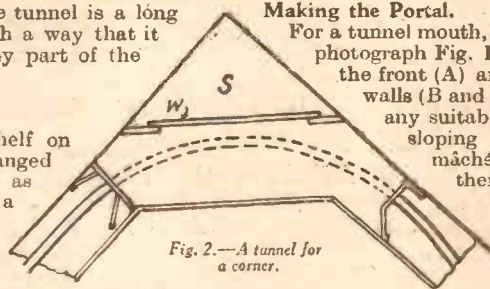
The main point to settle upon at the outset is the shape of the opening, and whether it is to span one or more lines of railway. On a piece of white paper lay out the over-all dimensions of the largest carriage, as viewed from the end. Mark out a load-gauge line some $\frac{1}{16}$ in. or $\frac{1}{8}$ in. all round the view of the vehicle, as shown in the accompanying sketches, Figs. 3 and 4. These limits are in excess of the actual end dimensions of the vehicle to allow for all kinds of contingencies—swaying of carriages, overhang on curves, and such like. Then draw in a portal which will just clear this loading gauge, making the outline as pleasing as possible.

TUNNELS, bridges and culverts are examples of the permanent works of a railway which must be introduced into a model line to give it the finishing touch of realism, in miniature, that all enthusiasts in this particular hobby desire.

The first-named item in an indoor railway system is usually relegated to a part of the room that cannot be made useful for other features of the railway. A corner is, perhaps, the most convenient place for a tunnel, and if it is chosen the possibility of a train derailment should be provided for. Especially if the tunnel is a long one, it should not be made in such a way that it is difficult to get at a train in any part of the structure.

A Tunnel in the Corner.

For a tunnel in a corner, the shelf on which the line is built may be arranged to span across from wall to wall, as indicated in the plan Fig. 2, leaving a clear space (S) to allow the operator (the model "breakdown gang") to remove the back wall (W) and put the train in running condition again. It does not matter how small the space is so long as the operator can just squeeze up into it. A back wall to the tunnel is essential. Although, from a practical point of view, it would be quite easy to leave the tunnel open at the back, the effect of darkness would be impaired. Where a corner site is not available, a part of the roof or the front side of the tunnel may be made so that it can be easily removed.



Making the Portal.

For a tunnel mouth, such as that illustrated in the photograph Fig. 1, there are three main parts: the front (A) and the two abutments or wing walls (B and C). The latter are placed at any suitable angle to the front, and the sloping hill made in the "papier mâché" formation is built up to them.

The front is pierced to the marked-out shape and edged with the arch stones as illustrated. Care should be taken to put the keystone exactly in the centre. The strip wood, forming the pilasters, is then applied and the whole surmounted by a cornice strip. The abutments (B and C) are similarly corniced, and when complete a good realistic finish may be obtained by distemping rather thickly with a light stone-colour coat of water paint, on which sand is thrown while the surfaces are wet. If two coats are necessary, the final one should have plenty of size in it.

Making the Tunnel.

The actual mound which the trains burrow their way through may be formed in a rough wooden construction. Builders' laths nailed to battens can be employed where the part so modelled is not required to be disturbed. On this irregularly made foundation wet brown paper, crumpled up into a rock-like formation, is then tacked down. This is finally finished by

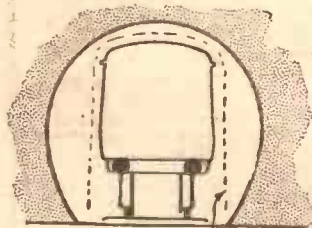


Fig. 3.—A tunnel for a single line.

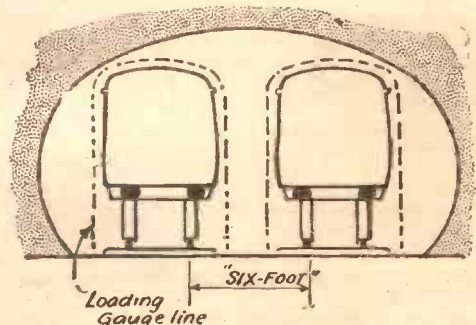


Fig. 4.—A tunnel for a double line.

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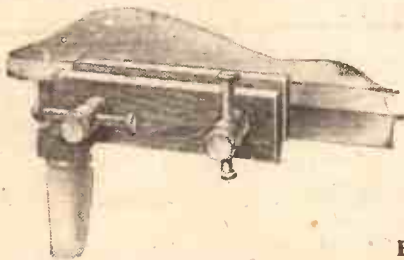


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A NOVEL METHOD OF ENGRAVING

By H. F. Atkinson

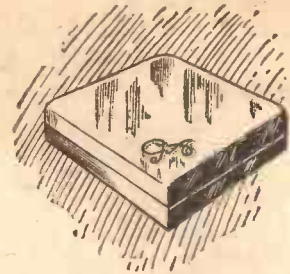


Fig. 3.—House names and numbers can be made to look very attractive.

Fig. 1.—Initials engraved on a metal box.

ENGRAVING on metal is an expensive operation, yet the average person who can solder may easily achieve success in this new process.

If you desire your initials on a metal box see Fig. 1.), first write them on paper the exact size that they are required on the box. Take a length of bar copper wire, clean it with emery cloth, bend it to the shape of the written initials and smear it with a good soldering flux. The most convenient flux to use is killed spirits or spirits of salt, which may be brushed on the letters with a small paint brush. Determine the position at which the initials are required, clean the surface, paint with flux, and then coat with solder (see Fig. 2). Place the wire initials in their correct positions, mount a few drops of solder on them and warm with a blow-pipe or bunsen burner until the

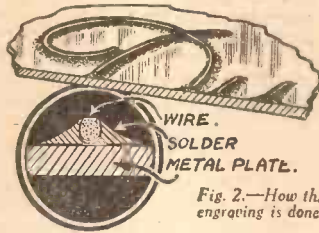


Fig. 2.—How the engraving is done

solder melts and "runs" over the letters, securing them firmly to the box. If the initials are fixed on a new piece of work, paint over them and when quite dry, rub with fine emery cloth until the initials appear in copper. Lettering may be done on copper plates, which may then be screwed on wooden articles. The appearance of a glove or handkerchief box is greatly enhanced when one's initials are in the corner.

House names look very attractive, and are very inexpensive when done in this way (see Fig. 3). Write the name in the correct size and style, and using thick wire, No. 14 S.W.G., form the letters as before. Take a sheet of copper for the base and drill it at the corners to take round-headed wood screws, frame the name with straight pieces of wire and paint and finish off as before.

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By Our Dog Expert



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HOW many of our readers have ever tried to play a one-stringed fiddle? Not many probably, because they always imagine that an instrument like this must cost a lot to buy and take a frightful lot of practice to learn. All the same, the outlay is worth it because an endless amount of enjoyment can be obtained from it, and the popularity amongst one's friends is increased considerably. The fellow who can sit down and play out half a dozen tunes on the quaint instrument illustrated, is always sure of a welcome. The question of cost may have worried those who wish to have one before, but now we

are going to show the way easily for himself at a total cost of 5s. 6d. This sounds absurd in view of the fact that bought instruments are usually about 20s., but there is really very little in the making, and less still in the finishing and fitting. After all, the instrument consists merely of a long neck and body to which a cross strut is added to hold the whole thing between the knees. At one end is fitted a metal arm and a horn, whilst along the whole of one edge is placed the single string which produces the music when played with an ordinary violin bow. A group of the parts necessary is given here, and the finished instrument is pictured both complete and being played by one of our readers. The latter illustration is helpful as showing the correct position in which the fiddle is held.

The Neck Cut Ready.

A little time ago we presented a free design and instructions how to make a banjo ukulele, and it is impossible to estimate the large number of our readers who successfully made this up. The fiddle this week is even more simple to construct than that, and a reference to the design sheet on which all the patterns are given will show how little there is to do. The body of the instrument consists of a piece 3lin. long cut from wood $\frac{1}{2}$ in. thick, and can be cut from beech or any similar hard wood. There is, however, really no need to do this because this part is supplied by Hobbies Ltd. cut to the shape required, so that it only needs a few small operations to finish it off. If, however, one prefers to cut out the shape with a fretsaw from an ordinary piece of wood, the method of pasting the paper patterns down is illustrated by the drawing on the sheet. The lower end of the

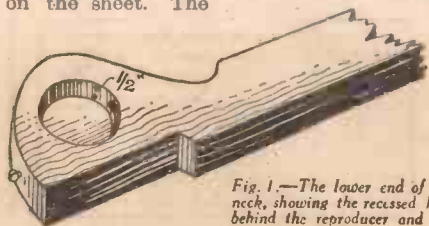


Fig. 1.—The lower end of the neck, showing the recessed hole behind the reproducer and the screw to hold the string.



Fig. 2.—The first illustration is of hole drilled to make a large recess, the shoulders being cleaned away as shown in the second picture

How to make FIJI FIDDLE

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instrument is pasted to the wood, and then the pattern of the upper end of the neck is put on so that the line AA is exactly over the line BB, which will make a continuation of the two outer edges of the wood parallel. The work of cutting is not recommended to the user of a handframe because the wood is so thick. The owner of a machine, however, again has the advantage of being able to complete the work quite easily because of the extra power provided by the treadle and the constantly upright saw. The easiest way, however, is to buy the whole parcel of wood and fittings so that one only has a few minor operations to perform to complete the instrument. The instrument is supplied with the body portion cut ready to the shape required, and with the necessary recess over which the sound box is screwed.

If you Cut Your Own Fiddle-Neck—

The only cutting to be done with a tenon saw is to make a recess for the knee piece. If one is cutting out the neck from a plain piece of wood, the sound box recess, of course, will have to be taken out by the worker. This is $1\frac{1}{2}$ in. diameter, and its position indicated by the pattern pasted down to the wood. The hole is cut with an expanding centre bit to drill the hole $\frac{1}{2}$ in. deep (see Fig. 1). If a larger bit is not handy, the hole can be made by boring eight or nine smaller ones (see Fig. 2) with a $\frac{1}{8}$ in. bit, and then cleaning up with a chisel and gouge. The square recess on the edge (for the knee piece) is cut with a tenon saw.

The Hole for the String.

Through the thickness of the wood we now have to bore a $\frac{1}{4}$ in. hole to carry the string from the neck to the end. Fix the wood in a vice so that the dotted lines on the pattern come upright. Use a brace with a sharp $\frac{1}{8}$ in. bit and drill a hole through the end of the wood straight downwards. Be very careful to see that this goes down dead straight and passes

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FIJI FIDDLE

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neck. The wire should be able to vibrate without touching any side. It has to be fixed at the end by tying it on a round headed screw driven in below the hole for that

through the recess opening before it goes in again to the thickness of the wood the other side. An extra long bit must be used for the purpose as the hole passes right through, as shown at Fig. 3. This hole must be accurately in line with the finger board edge of the neck, and this can be tested out by putting a piece of wire through the holes and laying it along the

purpose (see Fig. 1). At the other end of the neck a hole has to be made to accommodate the peg, which is supplied in the parcel of fittings. This peg tapers from $\frac{1}{4}$ in. outwards, and if the hole is made with a $\frac{1}{4}$ in. bit it can be enlarged at one end by turning a piece of sandpaper round a pencil or the end of a file, and rubbing the outer edge until it accommodates the peg comfortably. The actual position of the peg is given by the dotted lines on the pattern, and it will be understood that the hole must be driven through the edge of the wood centrally where shown. The little hole in the peg for the string thus comes immediately in the centre of the finger board. A bridge is provided by cutting a narrow groove just below the peg with a tenon saw, and the groove cut out with a $\frac{1}{4}$ in. chisel. A little bridge to the pattern shown is cut from any hard wood, and sunk and glued in place very firmly in the groove provided. The little nicks shown along the top edge of the patterns indicate the position of the notes, but they should not be made at present.

The Shape of the Neck.

The underside of the neck has to be rounded off to make it shapely and comfortable to handle. A section half way down is given on the design sheet, whilst the drawing at Fig. 4 also indicates this shape. This shaping is done with a

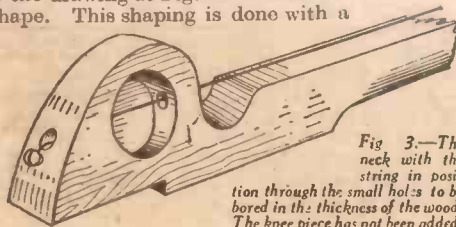
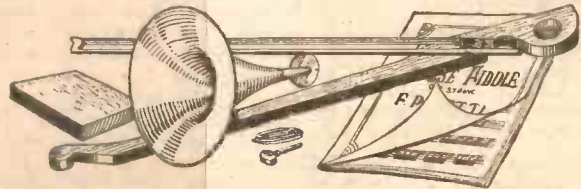


Fig. 3.—The neck with the string in position through the small holes to be bored in the thickness of the wood. The knee piece has not been added.

small plane, finishing off with a coarse file and finally smoothed down to the correct curve with sandpaper. All the edges of the wood, of course, should be smoothed down with sandpaper too, in order to produce a flat and semi-glossy surface. The wood as supplied is rough cut, but is soon cleaned up with a medium-grade paper. The edges on which the notes are to be indicated are, of course, left perfectly flat. To provide a holding piece for the knees, the pattern of the sheet has to be cut out from $\frac{3}{4}$ in. wood and screwed into the recess cut for it in the neck (see Fig. 1). See that it is glued and screwed at right angles with the neck midway across its surface. The curved ends are to



This is a complete set of parts you need. Note the special book teaching you how to play. The neck is supplied cut to the shape wanted, and with the large hole recessed.

accommodate the knees, and in some instruments these are padded with strips of green baize glued along the edge. This, however, is a matter of choice.

Fitting the String.

The actual instrumental part consists of the horn and the reproducer, which are supplied with the parcel. The reproducer is screwed on centrally over the recess and the horn is added to the short neck. It is made detachable in order that it can be taken off when the instrument is not in use. The single steel wire string is tied round the screw at the lower end, and then threaded through the two small holes and across the recess in the bridge part of the body. The long piece is carried to the peg threaded through the hole and tied in position there, after the peg, of course, has been put through the hole in the neck. The string thus fitted should rest on the bridge, but pass clearly through the hole and across the recess at the other end.

Tuning Up.

A violin bow is needed to tune up and play the instrument, and the most satisfactory way of getting the notes is to tune them in with the piano. The nicks made on the design patterns are not guaranteed accurate, as for many reasons there may be a slight variation. They are, however, a rough indication of where the playing notes should be, and will serve as a good guide from which to build up the whole range.

The completed fiddle should not, of course, be left in its natural state, but given a polished surface by means of Hobbies Lightning Polish.

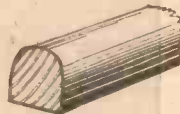


Fig. 4.—A section of the neck showing how it has to be nicely rounded off.

THE NECESSARY WOOD AND FITTINGS.

A special parcel is made up including the neck cut to the shape required, and with reproducer hole ready bored; the piece for the knee support; the reproducer or horn; wire string, peg and holding screw complete for 5/6 or 6/3 post free. A book on how to play, 2/- (postage 2d.) and suitable violin bows: 2/9 or 3/9 (postage 6d.)

This parcel obtainable from all Hobbies Branches, or by post from Hobbies Ltd., 111, D r ham, Norfolk. Canadian Dept: 844 Yonge St. Toronto, Ontario.

NOVEL IDEAS FOR SHELVES AND RACKS

A few odd pieces of wood can serve to turn a workshop or den into a neat and tidy place if you make up these novel sets of shelves.

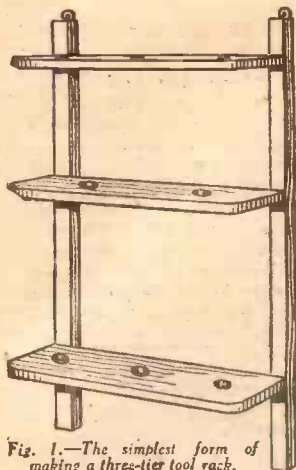


Fig. 1.—The simplest form of making a three-tier tool rack.

SOME original ideas for tool racks which can be made from stripwood and odd pieces. The handyman who works without bothering to have his tools in order, is working under difficulties, and such difficulties will detract from the quality of his work. Much time is lost looking for a certain tool, especially small ones, which have a way of eluding discovery. Such time is far better spent on the job. It is a good and sound maxim to have a place for everything, and everything in its place. The remedy is a tool box, but even here we are apt to have things in untidy order. The best system is a tool rack, which is easily accessible and in which tools may be replaced easily immediately after they have been used. Here, then, are a few ideas, each is easy to make, costs little, and can be constructed from stripwood, odd pieces and odds and ends from the odds box, which, by the way, every constructor should possess, being a large box containing any oddment which may at some time be useful for some purpose.

A Fixed Wall Rack.

The first type of rack (Fig. 1) consists of a number of tiers spaced at varying distances apart, and held by two side strips cut from wood 1 in. by 1 in. The distance spacings are unequal in order that the rack may carry tools of varying lengths and sizes. Each tier is bored with a number of holes, also of varying sizes, in order to take tools of different shape, and, in addition to this, hooks or tool clips, as supplied by Hobbies, may be fitted on the front edge of each tier. Tools may thus be dropped in the tier racks through the holes or held in the clips. A rack so made, and well arranged, will carry many tools of any description, and all will be easily visible and easy to place or extract. A brass plate for hanging (Fig. 2) is fixed to the top of the strips, and the shelves can be supported by repair angle plates (Fig. 2).



Fig. 2.—Three useful fittings supplied by Hobbies Ltd. The top one is an angle plate, the centre one a hanger, and the lower one a tool clip.

An Adjustable Wall Rack.

This type of rack (Fig. 3) is, of course, fitted by means of two screws, nails or plugs to a convenient position on the workroom wall, as is also the one about to be described. This adjustable rack is not rigidly assembled, but at each point of fitting has a single nail or screw as a pivot. This allows

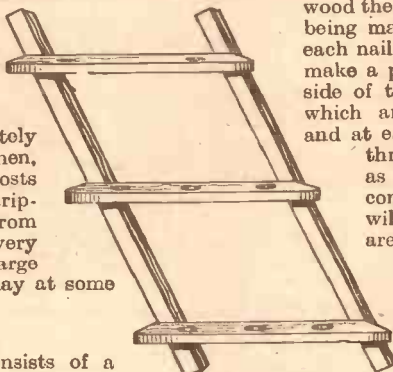
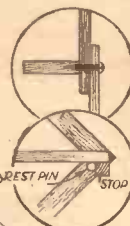


Fig. 3.—The way in which the tool rack at Fig. 1 may be altered for another class of tools or cramped space.

the rack to be set at any angle on the trellis principle. The reason for this may not at first be obvious, but here we need not have unequal distance spacing between the tiers. If the rack is fitted to the wall, as shown, for example, in Fig. 1, each tier will clear, and there is thus ample room for tools of any size or length in each one. In this case the rack is secured to the wall at four points instead of two.

An extending all rack is another type which may be fitted inside a tool box, as on the wall, and in use it may be extended to the dimensions desired and thus save space where space is limited. It is designed actually on the trellis principle, and details of the construction are shown in Fig. 4. Here we first construct from stripwood the trellis work section, each joined point being made by nailing with one nail only and each nail being riveted over at the back to make a permanent connexion. Down the left side of the trellis, however, the tier racks, which are equally spaced, are also pivoted, and at each of these points a screw driven through the trellis direct into each rack as shown. At the present stage of construction, the racks will flop down and stops are needed. These are fitted down the right side of the trellis and may take the form of wood pegs. Each stop will now hold each tier in a horizontal position, however, when the trellis is



extended. To complete the work further stops are needed, and these are fitted to each tier rack. The purpose of this is to prevent opening the trellis too far, in which case the tier racks would drop down. Where the two sets of stops meet represents the extent to which the rack can be opened. These further stops may take the form of wood dowel pieces glued in corresponding positions on the underside of each tier rack as shown in Fig. 5. The rack is fitted to

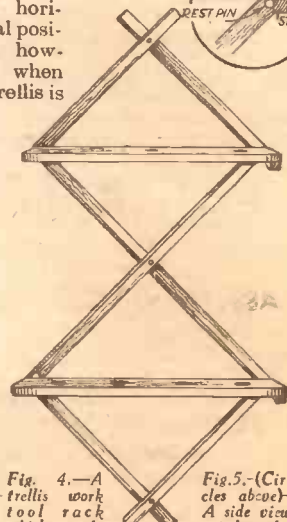


Fig. 4.—A trellis work tool rack which can be opened and closed as required.

Fig. 5.—(Circles above)—A side view with the screwed joint, and a front view of the pin and stop.

(Contd. on page 622.)



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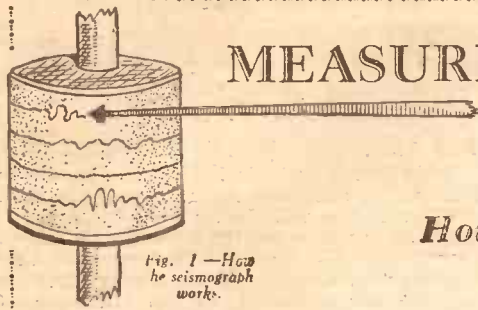
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MEASURING EARTHQUAKES

By D. Bartlett

How the Seismograph Works

THE recent earthquakes in Japan and Greece have left only too fearfully their marks on the buildings and surrounding country.

Earthquakes and earth-tremors are measured and recorded by an instrument known as a seismograph, which shows, by its chart, when an earthquake has occurred many hundreds of miles away, the direction from which the shock has travelled, and the severity of the shock. Some seismographs record the vibrations of the earth by means of a long stylus, or pen, on a drum covered with paper. This drum rotates by clock-work both on its axis and along its axis. This is done to save paper and to avoid having to put on a new piece every time the drum rotates, and the record made is in the form of a spiral. (See Fig. 1.)

In the modern seismographs, however, a beam of light takes the place of the stylus and the drum is covered with photographic paper.

According to the vibrations recorded by the seismograph, one can tell whether the earthquake has been serious or not. If there has been a really severe one, the chart will appear as shown in Fig. 2. If there has been just a tremor the chart will only show a slightly wobbly line.

A Model Seismograph.

You might make a model of a seismograph if you had a very high room in which to use it, but the model would only show violent earthquakes; it would not be sensitive enough to record earth-tremors.

The first thing would be to screw a hook into the ceiling. From this would hang, on a long steel wire, a heavy iron bucket with a tiny spout in the bottom, just wide enough to allow a little stream of sand to trickle through.

Right underneath the bucket would stand a small wooden platform on short legs. The platform would also have a tiny hole in its centre. Now, if some kind of tank were arranged over the bucket so as to keep it filled with sand, and the platform were nicely arranged underneath the bucket, there would be a constant stream of sand falling from the bucket, through the hole in the platform and forming a heap underneath it. (See Fig. 3.)

So long as the earth stayed steady the stream of sand would fall quite cleanly through the hole in the plat-

form, but if there happened to be a very bad earthquake the platform would begin to sway. The bucket, however, because of its mass and because it is suspended on a long, steel wire, would stay practically still. So you will see that as the bucket is still and the platform is swaying you would get a line of sand spilt on either side of the hole in its middle.

If you had marked out the platform with the points of the compass, as in Fig. 4, you would be able to say, according to where the line of sand lay, the direction from which the earthquake shock had travelled.

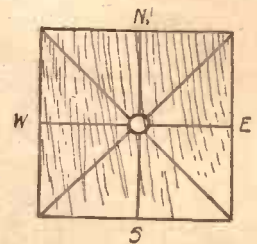


Fig. 4.—The platform of the table shown in Fig. 3 should be marked with the points of the compass.

The First Makers of the Instrument.

The Chinese were the very first people to make an instrument for recording earthquakes and earth-tremors, and their model was rather jolly.

They made a copper dome with eight dragons' heads round it. Each dragon had his mouth open, which formed an outlet for the dome, and each had a ball balanced inside it. The dome had a vessel of water in its centre, and the top of the water was just level with the back of the dragons' mouths. Round the bottom of the dome, and directly under each dragon's head, they stood a bronze frog with a wide-open mouth.

Every time the earth began to tremble or tilt through an earthquake, a little water spilt down some of the dragons' mouths. This started the balls rolling so that they fell out and were caught in the frogs' mouths. According to which frogs had caught a ball they were able to tell the direction of the line of the shock, and knew

when an earthquake had occurred days before a messenger could arrive with the news, which meant that they could send relief to the stricken area immediately.

Anticipating Earthquakes.

Perhaps in time somebody will invent an instrument which not only records the direction and severity of earthquakes, but anticipates them. Such an invention would mean an enormous reduction in the loss of life, as warnings could be issued to the threatened places, just as aeroplanes and ships are warned of coming gales and storms.

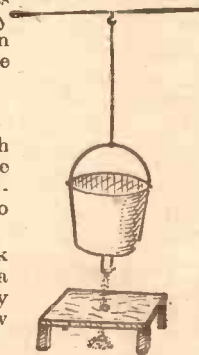


Fig. 3.—The apparatus here shown will make a good substitute for a seismograph.

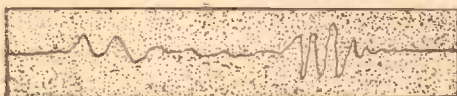
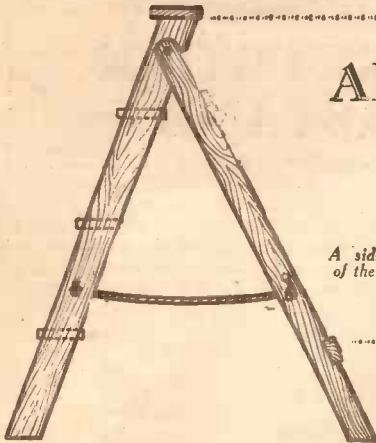


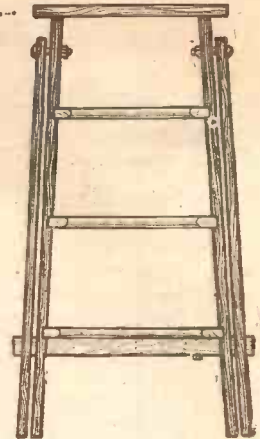
Fig. 2.—A chart showing an earthquake.

ANOTHER HANDY PAIR OF STEPS

By W. F. Morris



A side view of the steps.



A front view.

A previous article on making a pair of steps has appeared in "Hobbies."

HOUSEHOLD steps are of various kinds, but there is no doubt that for a serviceable and easily made article one cannot do better than make the solid variety on the lines described in this article.

The steps I am about to describe stand, when open, 3ft. high, and contain three treads. If this size does not suit the requirements of the reader he can quite easily make it to his own size.

The materials required to make this useful article are as follows:—

Timber: 2 sides, 3ft. 3in. by 3in. by $\frac{7}{8}$ in.; 1 piece (treads and top), 5ft. by 4in. by $\frac{7}{8}$ in.; 2 pieces (sides for back), 3ft. 2in. by 2in. by $\frac{7}{8}$ in.; 1 piece (back stretch), 1ft. 9in. by 2in. by $\frac{7}{8}$ in. Bolts: 2—2 $\frac{3}{4}$ in. by $\frac{3}{8}$ in., complete with nuts and 4 washers. Sash cord: About 4ft. Wire nails: 24—3in. long. Screws: 4—1 $\frac{1}{2}$ in., No. 10.

The most suitable timber to use is good sound yellow deal. This should be obtained cut to size and machine planed, as the little extra cost for this is money well spent. It may be as well if I give you some idea of the cost of all the materials required. It may vary from 2s. to 2s. 6d., according to prices in your district, but it certainly should be within these limits.

Having obtained your timber, check the measurements; this is important in case of error.

The Side Pieces.

Take the two pieces for the sides (3ft. 3in. by 3in. by $\frac{7}{8}$ in.) and select the insides and out-sides, then mark in the following manner: Place edge mark on front edge and face mark on the outside face; also mark Left and Right on the top of the outside faces. Now place the sides in the vice, or on the bench, together, faces outside, and working edges uppermost, plot out your distances between treads, also spaces for treads, the latter equals thickness of tread. Square across the edges, using the try square and pencil (Fig. 1). Take the sides out of the vice and open out on the bench insides uppermost and working edges outside, take the bevel and set to the required angle (Fig. 2); then place the stock of the bevel against the working edge and carry the lines representing spaces for

the treads across the inner side of the sides (Fig. 3). Next carry these lines across the back edges of the sides at right-angles to the face, therefore use the try square. When this is completed, check to save mistakes, set marking gauge to $\frac{1}{4}$ in. and "gauge" between the lines representing spaces for treads on both edges; using the stock of the gauge against the inside. This gauge mark gives you the depth of the trench.

Saw across the lines marked with the bevel to the depth represented by gauge mark, and remove waste with a chisel, taking care to start at the outsides and work to the middle. This waste can be removed with a router if any reader has one in his kit. To complete the sides cut off to the required angles at the top and bottom; use the bevel to mark for this.



Fig. 2.—Marking the angle on the side pieces.

THESE LINES SHOULD BE CUT WITH A MARKING KNIFE.

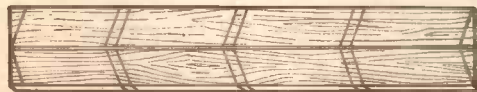


Fig. 3.—The spaces for the treads marked on the side.

The Treads.

Mark these out to the following lengths: 1—13in.; 1—14in.; 1—15in.; and 1 Top—16in. Use the try square and pencil. Although the steps taper, the treads may be cut off at right-angle, as the slight taper of each tread is negligible, and when tightly nailed the fit will be all that can be desired.

With your smoothing plane clean up the sides and treads, taking care not to make the treads too thin; this would mean a bad-fitting joint. You may finish off with glass-paper, but this is hardly necessary for this class of work.

Arrange the sides and treads together and nail, using 3in. oval nails. When arranging together, set the treads level with the back edge of the sides, thus allowing a projection to the front. The top piece may now be fixed; this can either be grooved and nailed, or nailed only. To complete the front portion cut about 1in. off the projecting corners of the treads, using a chisel and mallet for this.

The Back.

The simplest way to make a back is to take the two pieces, 3ft. 2in. by 2in. by $\frac{7}{8}$ in., and bore $\frac{3}{8}$ in. holes 1in. from one end of each, then bore corresponding holes in the sides of the front portion, allowing the pieces to be level at the bottom.

(Continued on page 630.)

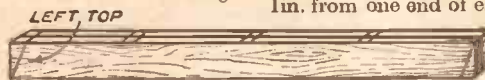


Fig. 1.—One of the side pieces



THE dainty little inkstand illustrated above is quite easily made because patterns for all the parts required are given full size on page 624. All one has to do is to paste these down on some suitable fretwood, cut them out with the fretsaw, and put them together according to the letters shown. All the parts are cut from $\frac{3}{8}$ in. wood and the inkstand will look quite well cut out in mahogany. Indeed, all the patterns can be pasted down on one of these standard panels of mahogany supplied by Hobbies for 5d. This is panel D, measuring 10 $\frac{1}{2}$ in. by 7 $\frac{1}{2}$ in. and $\frac{3}{16}$ in. thick. The first pattern to cut out, of course, is the largest part—which forms the base. At each end we have a tenon joint A, through which pass the two upright ends. Cut these parts carefully, and see that the flat base rests

Materials Required.

For this design Hobbies Ltd. supply a panel of wood (D) 10 $\frac{1}{2}$ in. by 7 $\frac{1}{2}$ in. by $\frac{3}{16}$ in. thick price 5d., and an ink bottle (No. 5660) price 8d.; price for a panel and bottle complete 1/7d. post free.

firmly on the two end feet. The two parts B are also feet, and they are glued on the underside of the base to support the centre. Dotted lines indicate exactly where they are placed. The square centre of the base is, of course, solid and not cut away, for it is here that the ink holder stands. This holder is specially supplied to fit, and is a glass bottle of special design from which the ink cannot be spilled. It is obtainable from Hobbies for 8d. (postage 3d.), and is No. 5660. This inkstand rests in the middle of the base, and is held there by four small strips (C), which fit together at the corners by a right-angle joint. Glue all parts together after the paper patterns have been cleaned away, and you have a useful and good-looking little article as a result of an hour or two's effort.

each case the tier racks for each design are the same (see Fig. 7).

As many tier racks as desired can be fitted by simply slipping over the rod one piece of tube (or a few reels) and then one tier rack. The top rack is held, as shown, by means of a washer and wing nut. Stripwood for making these racks is supplied by Hobbies, and for general use for many purposes, in addition to those described, it is a good idea to obtain a 100-foot bundle of assorted strips. Suitable pieces for the purposes described will be found in these convenient bundles.



NOVEL IDEAS FOR SHELVES AND RACKS (continued from page 618).

the wall or in the tool box by means of two screws. The last suggestion (Fig. 6) is a swivel stand rack. A hole

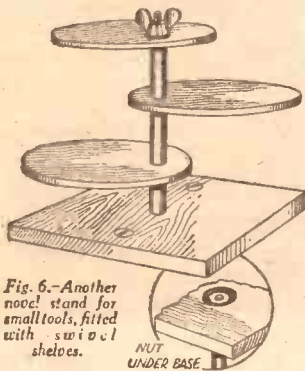


Fig. 6.—Another novel stand for small tools, fitted with swivel shelves.

NUT
UNDER BASE

is drilled to clear a piece of rod, and is recessed on the underside for a nut and washer. The rod is now fitted to the base piece by means of one nut and washer in the recessed part on the underside, and held by a further nut and washer on the top. Now obtain a length of ebonite tube or empty cotton reels. One piece of the ebonite is slipped over the rod (or four or five if a tier rack is fitted. In

each case the tier racks for each design are the same (see Fig. 7).

As many tier racks as desired can be fitted by simply slipping over the rod one piece of tube (or a few reels) and then one tier rack. The top rack is held, as shown, by means of a washer and wing nut. Stripwood for making these racks is supplied by Hobbies, and for general use for many purposes, in addition to those described, it is a good idea to obtain a 100-foot bundle of assorted strips. Suitable pieces for the purposes described will be found in these convenient bundles.

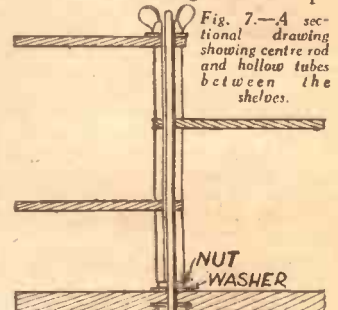


Fig. 7.—A sectional drawing showing centre rod and hollow tubes between the shelves.

NUT
WASHER

OUR GIFT FOR

FELLOWS nowadays have an amazing variety of subjects to turn their hands to during their spare time, and the letters we are constantly receiving from readers show their interest in hundreds of different splendid pastimes. In spite of all this, fretwork still holds almost pride of place in popularity, and proof of this is given by the number of fellows who make up our design each week. Further proof is that during the past two



NEXT WEEK

months it has been necessary to print no less than 1,317,000 of our popular designs to cover the demand by readers of Hobbies all over the world. Next week another of these sheets is being presented with Hobbies, and from the patterns thereon readers will be able to make up the striking Candle Bracket and Mirror shown herewith. These designs are worth 4d. each, but are presented free with each copy.

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Stronger, heavier, far more realistic than anything you have ever seen before. See the Bowman dynamos, grindstones, presses, shafting and saws etc., at your local shop. The fine press shown costs only 2/11 (post 4d.).

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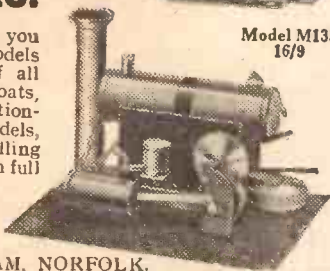
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Model M135
16/9

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V. England-Richards, Esq., KING'S LYNN, Norfolk.

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After five years' practical experience I find the demand increases from year to year enormously, regardless of competition.

The following summary will interest you in regard to the earning capacity of your proposition in my case, which I feel is by no means exceptional.

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Nett Profit after deducting all charges: £16 3s. 7d. per month.

I consider this result excellent and myself well paid bearing in mind that my activities are not solely concerned with the manufacture of Dry-Cell Batteries under Licence from your Company, and therefore the profit made may be considered as part time earnings only.

I can truthfully say that I have never had cause to regret taking out a Licence over five years ago.

Yours very sincerely, (Signed) W. Chadwick.

P.S.—My best customers have been Bus Companies, Garages and the owners of Wireless Sets.

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WE GUARANTEE YOU PROFITS!
No unauthorized person can copy you—these Batteries are protected under Royal Letters, Patent and the Market cannot become overcrowded. The Demand is GROWING every Day—*somebody* in your District has got to benefit by it—WHY NOT YOU? Start on the Road to Independence NOW by posting this Coupon TO-DAY!

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Print your name and address boldly on a plain sheet of paper and pin coupon to it.
Hobbies, 7-2-31

Cut your own LOUDSPEAKER FRONTS

Have a loudspeaker front of your own make. Anyone with a Hobbies fretsaw can cut out one for himself. The patterns are supplied of each of those illustrated; all you have to do is to paste them down and cut out. With 10in. fretted circles, they can be adapted to large boards easily. Full instructions given with each. Quote number when ordering.

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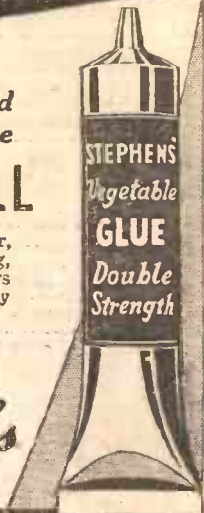
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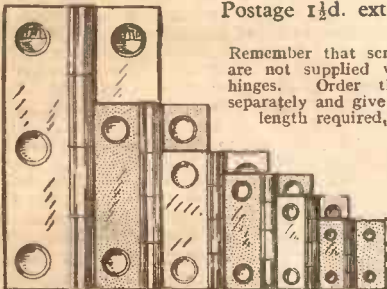
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Prices 4d. 2d. 1½d. 1d. 1d. 1d. 1d. per pair

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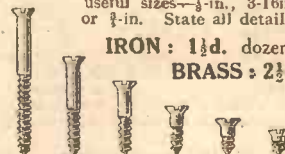
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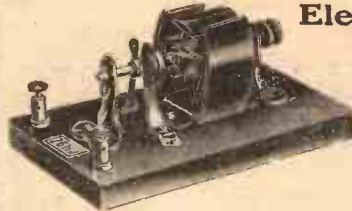
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Mark all envelopes containing stamp queries with the word "Stamps" in the top left-hand corner.

THOSE who get their impressions of Japan from Gilbert and Sullivan's opera will find themselves very far indeed from the actual facts. No longer is the picturesque title "Mikado" used to designate the monarch who sits on the imperial throne; since the Land of the Rising Sun has been dominated by Western ideas its ruler has been known as the Emperor. So far from wielding the despotic powers so comically parodied by Gilbert, the Mikados of the old régime dared hardly call their souls their own, and only maintained their position as titular heads of the State because their subjects regarded the royal family as holy, and the head of it as the deity.



The Empress Jingo, who is said to have invaded and subdued Corea in the third century A.D.

The Mikados of the old régime dared hardly call their souls their own, and only maintained their position as titular heads of the State because their subjects regarded the royal family as holy, and the head of it as the deity.

The Shogun.

The real political power was in the hands of the generalissimo of the army, who was called the Shogun; all orders to the headmen or Lord High Executioners came from him; to him trembling caitiffs kow-towed humbly, and from him, and him alone, issued those commands that steered the ship of state. So abject was the condition of the Mikados at some periods of history that the royal court is known to have gone hungry in times of famine, while the Shogun and his sate lites wallowed in luxury. It is even said of one unhappy emperor that, in order to make a little pocket-money, he was reduced to selling the royal autograph! As a set-off against these indignities it is good to know that, at intervals in the course of ages, the royal



The lowest value of the 1876 issue. Note the chrysanthemum with sixteen leaves—the Emperor's personal badge.

ROMANTIC JAPAN

By P. L. Pemberton.

line bred men, and at least one woman, strong enough to dominate all the forces opposed to them, and to wield the sceptre to real purpose. The school-children of Tokio and Yokohama, if they have to master the dates of their kings and queens, do not get off so lightly as those of our own land, for Japan's is the longest unbroken dynasty in the world the present Emperor being the 123rd in an unbroken line!



One of the cherry-blossom series of 1873. The national flower appears in each corner.

grips the imagination. Unfortunately, her history is known to be mainly legendary, as she belonged to the period before the Japanese had learned the art of writing, when the national records were handed down from father to son by word

The Empress Jingo.

Of them all the Empress Jingo, whose portrait appears on the two highest values of Japanese postage stamps—the 5 and 10 yen—most strongly

of mouth and perpetuated doubtfully in the recitals and songs of minstrels. The Empress Jingo is said to have reigned as Regent from A.D. 201 to 269, and to have died in her one-hundredth year. The exploit which makes her reign especially memorable is her invasion, at the head of a huge army, of the neighbouring country, Corea. The monarch of that kingdom was forced to submit in face of the overwhelming character of the invasion and to swear that "until the sun sets in the east, until rivers run towards their sources, and until pebbles ascend to the skies and become stars," he would do homage and give tribute to Japan. The narrative as it has been handed down is embellished with much supernatural frilling—sufficient to discredit the whole tale, which is probably entirely fanciful. Nevertheless the Japs hold firmly to the main outlines and honour their ancient heroine on their stamps.

The First Stamp Issued.

About a hundred years after the death of the Empress Jingo the Japanese received a large number of visitors from China who taught them the secrets of their own highly developed civilization. Then, as now the Japanese were very receptive of new ideas and soon became proficient in the arts of their neighbours. Chinese ideographs were twisted and inflected to form the basis of an alphabet to suit the Japanese tongue and, which is more important to philatelists, the whole of Chinese mythology was adopted and grafted on to that of Japan. Thus we get the dragon which is such a feature of the first postal issue, as well as the sun and the moon, which crop up in the designs of subsequent issues. Shinto, the simple religion of the mass of the Japanese people,



The first issue of 1876, wavy wheels in the bands indicate the need of the post.

IN YOUR HOME

ARE THERE ANY

- PENSION PROBLEMS
- LEGAL WORRIES
- DOMESTIC TROUBLES
- HEALTH ANXIETIES OR
- RENT QUERIES



IF SO THE FREE ADVICE OF EXPERTS IS GIVEN IN

TIT-BITS

EVERY WEEK

TWOPENCE.

led to the use of less fearsome symbols, and hence we find flowers and trees figuring on many of the issues. By reading the Japanese stamps correctly, in the light of history, the collector is able to trace much of the fanciful trend of Japanese thought during past ages and though there is little of actual fact, the study is none the less fascinating.

When the first stamps appeared in 1871 Japan had but lately emerged from its age-long seclusion. The country had been "out of bounds" for all foreigners for four hundred years prior to 1850. At this date



The 25 sen stamp of 1888

the Americans, quickly followed by the British and other European nations, forced the Japs to open up their country to the rest of the world. This forcible and deeply resented impact with the West led to remarkable developments for the island empire. The Shogunate was abolished in 1868, and the Emperor, for the first time for centuries, was endowed with the full powers of his state. This date is regarded by the Japanese as marking the close of their middle ages and the beginning of a new era.

Establishing a Postal Service.

A postal service, modelled on Western lines, was established in 1871; four small square stamps featuring two dragons, with tails interlaced below, were Japan's first contribution to philately. The dragon has not disfigured a Japanese stamp since the first issue was retired. A feature of all succeeding issues, without exception, is the chrysanthemum, which is represented by a circular device composed

DO YOU KNOW—

THAT there is a great revival of interest in local stamps?

That it is thirty years and more since any dealer published a catalogue of the local stamps of the world?

That various locals are now included, quite inconsequently, in general catalogues?

That of these the "Lady McLeod," included in Gibbons' under Trinidad, is catalogued unused at £200?

That the New York Museum is preparing an exhibit representing the history of the New York Post Office?

That the Falkland Islands provisional 2d. stamp, surcharged 2d., issued in 1928, changes hands at about £10 each?

of sixteen petals radiating from a small button at the centre. The number of petals is of the utmost importance; let there be one more or one less and the symbol loses its authority. No subject may, without dire penalty, represent a chrysanthemum with this exact number of leaves, for it is the personal crest or badge of the present Emperor, and of all others as far back as history relates. All issues up to 1875 show a cherry blossom at each corner of the design. This is the really national flower of the Japanese people. For us it is difficult to realise the intense love of flowers fostered by every Japanese man and woman. Festivals are held throughout the land when the cherry is in full bloom; the blossom is almost worshipped, though the

fruit of the Japanese cherry is of no account, being woody and bitter to the taste. The cherry blossom is universally accepted as symbolising the spirit of Japan.

Hand-engraved Stamps.

The issues up to 1875 were engraved, and issued in sheets of forty. A feature that gives them particular interest in the eyes of collectors is the fact that each stamp on each plate was engraved separately by hand. In England at that time, and elsewhere, engraved stamps were printed from plates on to which the designs were transferred by a mechanical process from a single original die, resulting in all the impressions being exactly the same in every detail. The Japanese artists copied a single original forty times on a plate with an accuracy which was almost miraculous, though it was humanly impossible to get them all exactly alike to the minutest detail. Advanced specialists in the stamps are thus able to reconstruct sheets from single specimens by identifying the separate units from photographs of entire sheets of the original stamps. Altogether about 130 different plates were engraved in the six years, representing 5,200 separate engravings.



The first Japanese stamp. Two dragons enclosing the native inscription in the centre.

The Cherry-Blossom Series.

The modest collector can still procure several varieties of the line-engraved stamps, popularly known as the cherry-blossom series, for a few pence each, though there are varieties which command over £100, and would be readily snapped up at this figure.

HISTORY OF CANADA ON STAMPS (concluded from page 564, January 24th issue).

The Federation.

The next important event was the federation of the separate provinces, effected on July 1st, 1867. Nova Scotia and New Brunswick came into this at once. British Columbia was admitted in 1871 and Prince Edward Island in 1873. The Hudson's Bay Company sold its territories to the Confederation in 1869. The portrait of Sir John Macdonald, together with that of Sir Wilfrid Laurier, another celebrated Canadian statesman, though of later date, appears on the 12c. of the 1927 set of Canada, and also on the 1c. of the same issue. It was largely due to the initiative

of Macdonald that the Dominion was established, and he became the first premier of the federated provinces. The Canadian portrait gallery includes a stamp of the value of 20c., also issued in 1927, on which are portrayed the features of two celebrated Canadian statesmen of earlier days—Robert Baldwin and Sir Louis Hippolyte Lafontaine. Together these two formed ministries in 1842 and 1848. In the same set of stamps was a 5 cents value with portrait of the brilliant Irish-Canadian politician and author Thomas d'Arcy McGee. This fiery spirit had been a leader of the "Young Ireland" party before leaving the British Isles, and on the

failure of the movement escaped from England disguised as a priest and reached the United States. Arriving in Canada in 1857, he quickly made his mark in politics. Elected member for Montreal in 1858, he became President of the Council in 1862 and Minister of Agriculture in 1864. McGee would undoubtedly have succeeded to greater honours but was assassinated on April 7th, 1868, at the early age of forty-three. More recent Canadian stamps bear views of typical Canadian scenery and public buildings which testify to the present standing of the Dominion as one of the greatest countries of the world.

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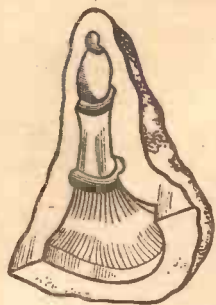
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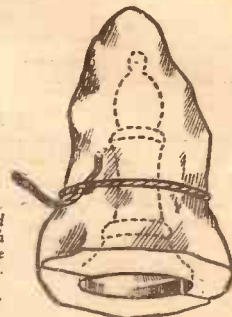
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SIMPLE PLASTER CASTING

By H. G. Hobdell



The mould split after cutting in two.



The mould tied together with string round the object being cast.

MAKING plaster casts is a really fascinating pastime, and is one, moreover, which requires no great skill and only the simplest of materials. Anyone who is useful with his hands will soon discover all the interesting possibilities of this art, and give pleasure to himself and to his friends. It often happens that a single ornament in the house is not used because a pair is needed, so that a knowledge of how to make a copy of such an ornament is always useful. Since the original is not harmed, it will also be possible to copy a friend's ornament to which you have taken a particular fancy. All you will require in the way of materials is some plaster of Paris, soft soap, and oil. These may be obtained cheaply from an oil and colour merchant. Some strong thread, a little cochineal or red ink, and a mallet and chisel complete the necessities.

Commence with Simple Objects.

Choose for your first attempt some simple object without too many corners, such as a chess piece illustrated in the diagram. Mix the soft soap with hot water and rub it over the object, taking care that no small patches are left uncovered. Now put a piece of thread all over the middle of the object, leaving long ends on either side, as the diagram shows.

The soft soap will help it to stick a little. Mix the plaster of Paris with cold water in a basin until it is of the consistency of thin batter and colour it pink with red ink or cochineal. Pour the plaster over the ornament and spread it until there is a thin crust. Follow this with some ordinary white plaster until the crust is about half an inch thick, although the correct thickness depends upon the size and is only found by experience. The plaster must now be left until only a little flakes off when it is scratched. When this stage is reached, you proceed to cut the cast in two by means of the thread which has been left projecting on either side. Take each end in turn and pull upwards carefully, finally removing it by pulling both ends together. Your mould should now be in two pieces.



The dotted line denotes the thread passed round the object.

Coat the Mould with Soap.

Coat the part of the mould which has been in contact with the ornament with more of the soft soap and fit the two halves exactly together. Tie them tightly with a piece of string, choosing a part of the mould so that the string will not slip, and the result will be a kind of cup which is the exact shape of the ornament. Your work should look now as in the second illustration. Get some ordinary oil and brush it all over the inner surface of the cup. More plaster must now be mixed, thinner than before, and poured into the cavity up to the rim.

Chipping the Plaster.

The work must now be left for at least twenty-four hours to allow the plaster to set really hard, and then follows the most delicate and interesting part. The plaster of the outer mould must now be chipped away, leaving the inner cast intact. Use a small mallet and chisel for the work and go gently, especially when you get down to the layer of pink plaster, for this is the layer next to the cast itself. This sounds difficult, but in practice the plaster flakes off quite easily if normal care is used. The finished cast should be quite white, any pink bits adhering to it indicating that all the outer mould has not been removed. Now you may see why the first layer of plaster is coloured. These last little bits are best removed with a file, as the chisel is liable to cut into the cast.

If you would like to paint the cast, choose oil paints or enamel, finishing off, when the paint is dry, with a layer of white spirit varnish. Sometimes you may like to make the cast itself coloured, in which case the liquid plaster should be first coloured with water colour or dye, remembering that it will dry a little lighter than it appears when wet. Do not forget in this case, however, that your first plaster layer must be distinctive in colour from the final cast or chipping off will be difficult.

ANOTHER HANDY PAIR OF STEPS (continued from page 621).

use your smoothing plane to clean these two pieces, then bolt them in position, using 2½ in. by ½ in. bolts. Place washers between the pieces as well as under the nuts, and secure the two back pieces with the stretcher rail at a place just below the bottom tread. This piece should be cleaned, and can be housed into the sides to a depth of ½ in. and nailed in position with 2 in. oval nails, or much better screwed with 1½ in. No. 10 screws. If the



Fig. 4. — The trench cut for the treads.

stretcher rail is allowed to project in, over at the ends it will add considerably to the strength of the back.

To complete these very useful and easily made house-steps fix two pieces of sash cord to limit the opening.

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By No Means the Last!

THE envelope of fittings for our model Autogiro which every reader receives with this week's issue does not spell finale to our scheme of free insets. No! There are many other things which I shall announce very shortly. I think all readers will agree that our model Autogiro is even better than a model aeroplane. I shall continue to set the standard for others to follow. Watch this page!

Make Your Own Billiard Table—

ALMOST every piece of cabinet-work and woodwork which it is possible for the home mechanic to make has been detailed and described in our pages. A billiard table design, however, has not often appeared in print. In next week's issue will appear a well illustrated article by a practical craftsman, explaining how a billiard table may easily be made by any fellow at home, and so that I can continue to carry out my policy of giving up-to-date information on subjects which are not hackneyed—information, too, of the hard-to-get variety—I hope you will all continue to fire in your suggestions. And when I say "all" I should like to say that it would require thirty Albert Halls to accommodate my readers!

—And a Design for a Dynamo.

THOSE readers interested in electricity will welcome a practical design for a small charging dynamo having an output of 18 watts to appear next week. This dynamo may be made at home quite cheaply and without expensive apparatus. Such a dynamo may be used for a variety of purposes, such as charging wireless accumulators and providing power for a large number of electrical models. Every piece of the apparatus will be fully illustrated and described.

Notes and Notions.

MANY readers submit notes and notions on pieces of paper which do not contain their names or addresses. So that we can promptly

despatch the 5s. we pay for every item published, will those who submit paragraphs for publication on our "Notes and Notions" page, please append their names and addresses, and when their paragraphs are published send in a postcard to the Editor, claiming their five shillings!

The Motor-Cyclist's Reference Year Book.

I HAVE just been glancing through the "Motor-Cyclist's Reference Year Book," published by the Proprietors of HOBBIES at 1s. This



volume consists of no less than 144 pages, packed with all the facts and figures relating to the sport and hobby of motor-cycling. It deals with overhauling, lighting systems, magnetos, carburettors, insurance, speedometers, Brooklands, steering, sparking plugs, engine tuning, tyres, clubs, etc., etc., and is a veritable encyclopaedia on motor cycles. It is the only Year Book relating to motor-cycles and is remarkable value for 1s. It is obtainable from all newsagents, or from the publishers for 1s. 2d., post free.

REPLIES AND QUERIES.

Graf Zeppelin Queries.

The *Graf Zeppelin* is the 118th of its kind, H. H. (Coventry). Its length is 775ft., diameter 100ft., capacity 3,708,600 cubic feet. It can carry a load of 14 tons a distance of 6,000 miles without refuelling. 2,649,000 cubic feet of hydrogen is contained in seventeen divisions in the upper area of the Zeppelin and 1,059,600 cubic feet of "Blaugas" contained in twelve divisions in the lower part for the engines. The highest speed is 80 m.p.h., the cruising speed 72 m.p.h., and the total h.p. 2,50. The structure of the Zeppelin contains thirty tons of metal, and 22,800 yds. of cable and piano cord. It has five "Mayach" engines, each on line being 550 h.p. direct drive, and placed in three cars. It can be driven on gas or liquid fuel. It is 63ft. longer than the B100, but 30ft. less in diameter.

Some "Blue-Bird" Details.

The estimated speed, B.N.D. (Exeter) of Campbell's "Blue Bird," is 260 m.p.h. The engine is 1,450 h.p., the driving seat is only 10in. from the ground. Most of the engine power is used up in overcoming air resistance.

Model Aeroplane Queries.

The best elastic to use, O. N. H. (Wimbledon) is 3/16in. by 1/32in. Several advertisers in HOBBIES sell suitable lubricant for elastic. It is necessary to apply this lubricant every fourth or fifth flight, for this allows more turns to be given to the elastic skin and considerably enhances the life of the elastic itself. Vaseline should be used to lubricate the bearings.

Making Yellow Lacquer.

Yellow lacquer may be made, S. A. (Tooting), by mixing together 2oz. shellac, 3oz. gamboge and 2oz. turmeric, dissolved in 2 pts. of methylated spirits.

Repairing Cracked Celluloid.

To repair cracked celluloid, F. T. (Edinburgh), brush the fractured surfaces repeatedly with a mixture of 3 parts of alcohol and 4 parts of ether until the celluloid softens, when it can be squeezed together easily; the pressure must be maintained for about a day. Quicker results are given by using a solution of a little shellac in a mixture of 1 part of ether and 3 parts of alcohol, applying this cement warm, the article also being warmed. By using simple concentrated acetic acid, joints can be made almost instantly.

The Deepest Mine in the World.

The deepest mine in the world, W. H. (Greenwich), is the St. John del Rey gold mine, in Brazil. Begun over eighty years ago, it has reached a depth of 6,326ft., and is still being extended.

Varnish Stains.

Place in a well-stoppered bottle, M. D. (Exeter), 6oz. of orange shellac, 1oz. of gum and 1gal. of methylated spirit, and agitate at intervals, until all the shellac has thoroughly dissolved; then add an aniline dye of any desired colour soluble in spirit. The mixture should then be strained, after which it is ready for use. The following are a few of the aniline colours used. For rosewood, cherrywood, and mahogany, use bismarck brown in variable proportions; for walnut, use bismarck brown and a little nigrosine; for light and dark oak, use vandyke brown; for satinwood, use aniline yellow; and for ebony, use brilliant spirit black. These stains dry in about twenty minutes, with a hard, brilliant, and durable surface. Care must be exercised not to apply the brush too rapidly, and only in one direction.

Removing Rust Spots from Cloth.

Place the part in a saucer containing a mixture of one part of hydrochloric acid and three parts of water. After the rust spot disappears, the cloth must be thoroughly rinsed out with abundant water and then washed. I hope this is the information you require, H. U. (Guildford).

Advertisements are accepted for these columns at the rate of 1d per word, prepaid

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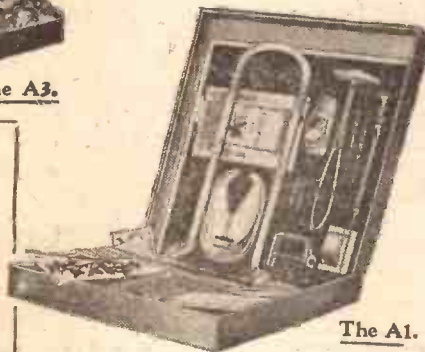


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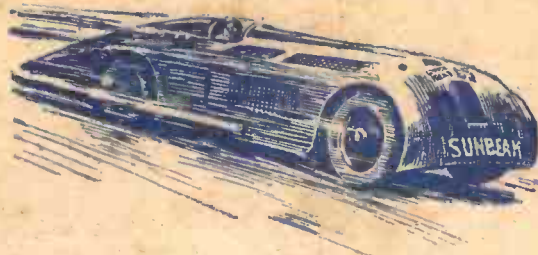
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