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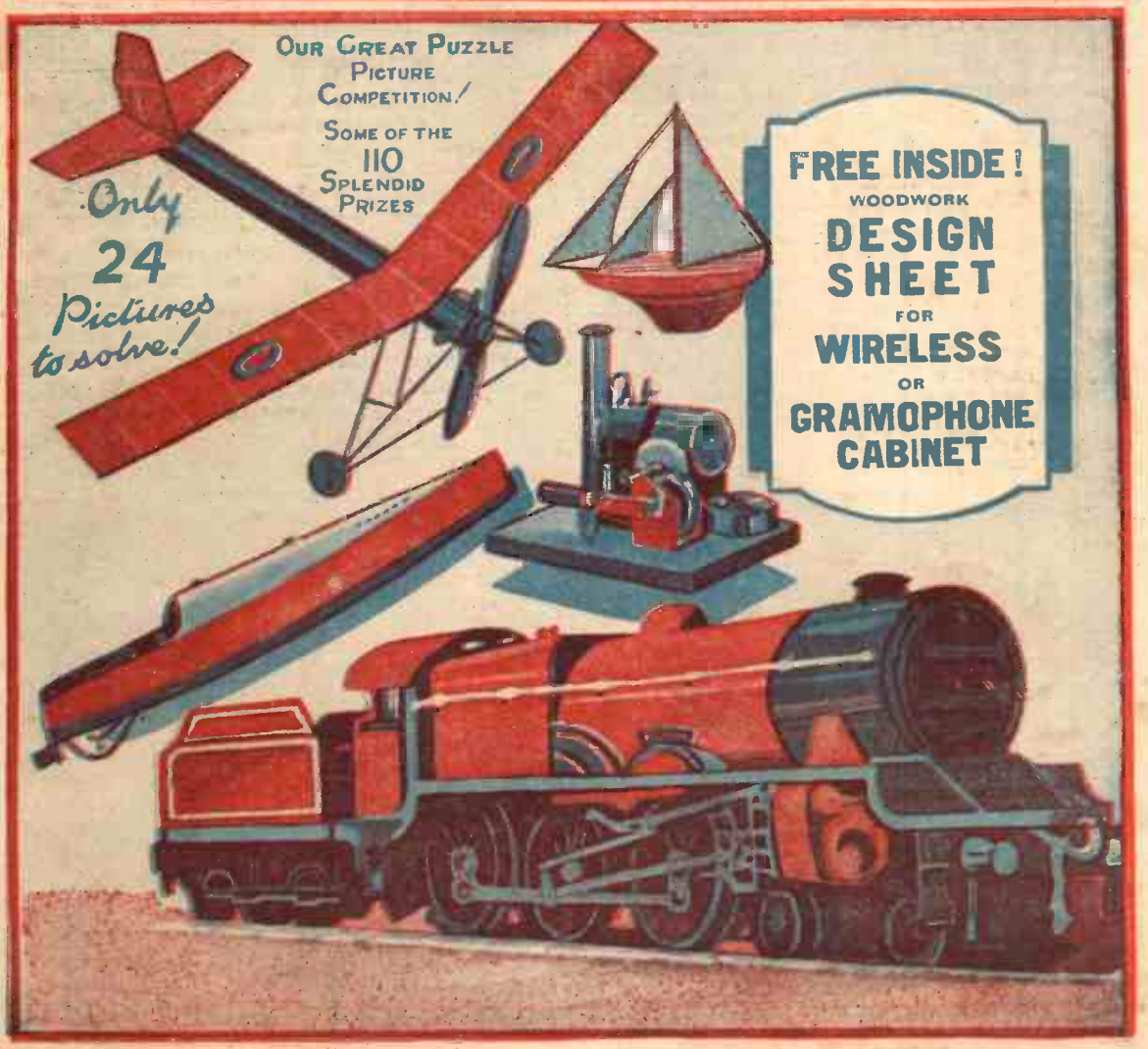
October 18th, 1930.

No. 1825.

Published every Wednesday.



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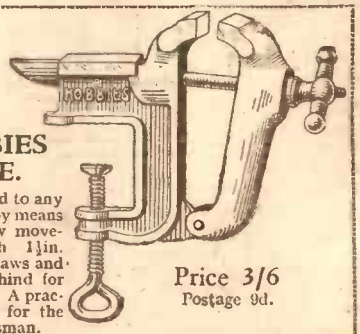

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Hobbies

Vol. 71. No. 1,826. Published Every Wednesday. OCTOBER 18th, 1930.

THIS WEEK'S CLEVER IDEAS.

Magnifying Lens as Spectacle Attachment.

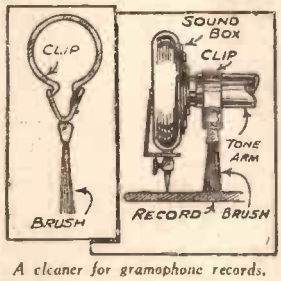
STAMP collectors and others who require the use of a magnifying glass in their work or hobby will find extremely useful a small attachment to the ordinary spectacles. It takes the form of a lens about a ¼in. in diameter which is clipped to the rim of the spectacles so that by a flick of the finger it may be swung down over the ordinary spectacle lens, and just as easily flicked back out of the way. If spectacles are not normally used the device may be attached to a spectacle frame without lenses.

Metal Treasury Notes.

A METAL paper which can be neither burnt nor torn has recently been produced. Paper pulp is coated with either molten tin, copper or aluminium. A paper made in this way is very hard and very elastic and is being used extensively for wireless work. It is shortly to be adopted by one or two Continental banks for treasury notes, for it would be almost impossible for a forger to counterfeit notes made in this way.

A Gramophone Record Cleaner.

THE surface of gramophone records absorbs grit, and under the sliding action of the needle the grit acts as an abrasive and soon spoils the record. An idea recently marketed consists of a small brush, similar to those used by typists, which is attached to the tone arm immediately in front of the needle. It thus precedes the needle, and leaves the grooves on the record clean for the needle to follow.



A cleaner for gramophone records.

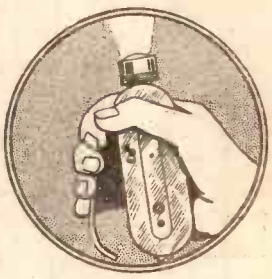
An Electric Signalling Gauntlet.

A NOVEL gauntlet glove for cyclists, motor-cyclists and motorists now being sold has a red light on the back portion of it which lights up when contact with a small switch is made, by pressing the thumb and forefinger together. The small battery which operates it is accommodated in a tiny pocket incorporated in the palm of the glove, and it lasts for a considerable time.

An electric signalling glove.

A Torch which Does Not Need a Battery.

SEVERAL attempts have been made to improve upon electric pocket torches. Dry cells as a rule are unsatisfactory, because of their comparatively short life. Some time ago a pocket torch was produced containing a small electric generator. This was not entirely satisfactory, but the inventor has now marketed an improved version of it. By pressing the lever at the side, electricity is generated and the bulb sends forth a brilliant beam of light. The mechanism is light in weight (no pun intended!) and there is nothing to get out of order. Additionally, it is no larger than the ordinary pocket torch.



An electric pocket torch without a battery.

A Harmless Toy Machine Gun.

THE objection which most parents have to toy pop-guns is the danger accruing from the use of the pellets and darts used in connection with them. An inventor has got over this difficulty by producing a gun which, whilst producing without explosives quite a loud bang, needs no ammunition other than a small spool of paper. This spool is carried over the mouth of the gun and a spring plunger released by a trigger causes the piece of paper immediately over the barrel to burst with a loud report. By turning a knob a fresh piece of paper is brought over the barrel.

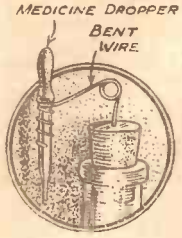
Stand Attachment for Bicycles.

THE bicycle is an awkward piece of mechanism in that it requires something against which to prop it when it is not in use. As a result walls become damaged and the finish of the bicycle is frequently impaired. A simple device, long overdue, has recently been marketed to get over the difficulty. It consists of a light stand, similar to those fitted to motor-cycles, attached to the rear forks of the bicycle. It is normally held up by a clip attached to the mudguard, but when required for use a tap with the foot releases it.

INGENIOUS IDEAS FROM OUR READERS.

For Medicines Measured by Drops.

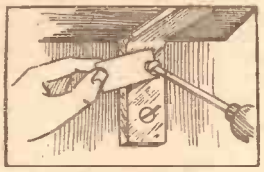
THE illustration here shown indicates a fountain-pen filler attached to the cork of a medicine bottle. Make a coil of spring-brass wire to the shape shown, as a support for the filler. For medicines which are measured by drops the device will be found very convenient, for a drop measure in any other way is likely to provide an inaccurate dose, which in turn might produce dangerous results in the case of certain medicines.



A fountain-pen medicine dropper.

Inserting Screws in Awkward Places.

IT is often necessary to insert a screw in a part which cannot easily be reached by both hands at once. To get over the difficulty push the screw through a piece of paper, hold it in position and start it with a screwdriver. The paper may then be torn away. The length of the paper (or cardboard in certain instances might be used) should be adjusted to suit the work in hand.


How to insert screws in awkward places.

A Pencil Sharpener.

A VERY useful pencil sharpener can be made from a piece of triangular corner filleting as used by fretworkers. Brush the three surfaces over with hot glue and apply some powdered emery. Two or three grades of emery powder may be applied to the different surfaces, the coarse grade for blue pencils and the finer for lead pencils. If emery powder is not obtainable, glue on some strips of emery cloth.

An easily made pencil sharpener.

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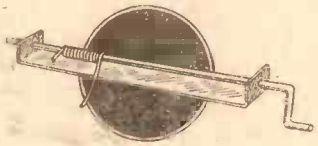
Making Coil Springs.

TAKE a piece of iron about 12in. long, 1in. wide and ⅛in. thick, turn up the ends as shown in the sketch, bore holes for the crank and bore holes in the end of the crank to receive the ends of the spring wire. The device can be fastened to the bench with screws or held firm in a vice, and springs of any length up to 12in. may thus quickly be made; and by having a number of spindles of various sizes handy, springs of various diameters can be made.


Simple device for making springs.

Making Castors for Furniture Legs.

OLD ball-bearings, about ½in. diameter, make excellent castors for the legs of furniture. Cut some small brass plates of a size to suit the base of the legs, and drill a ⅜in. hole in the centre of each. This will allow the ball to project through. Next drill a ½in. hole up each leg of the piece of furniture, push in a piece of steel spring, place a ball-bearing over, and finally screw down the cover plate. The holes in the legs should, of course, allow for free movement of the spring and ball; a slight trace of vaseline on the spring assists matters in this respect. Perhaps some steel washers may be obtained which will act as cover plates.

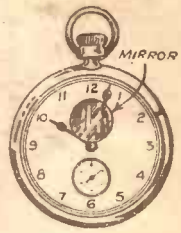
A Screw Which Cannot Be Removed.

ON sheds and other structures having outside hinges, the ordinary lock does not present any difficulty to the pilferer, because he can easily unscrew the hinges unless they are bolted and nutted on the inside. By filing the screw in the manner shown, it cannot be removed with a screwdriver, and provides an effective safeguard.


Making the wood screw thief-proof.

A Watch Glass Mirror.

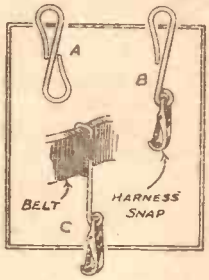
MOST watches have a little unused space on the glass which can be converted into a small mirror. Cut a piece of tin foil to the size required and clean one surface and the inside of the watch glass with ammonia. Now rub a drop of mercury over one side of the foil, and then dip it in mercury. Next press the surface previously rubbed with the finger tip, into contact with the watch-glass and you will have a perfect miniature mirror. The shape of the mirror need not necessarily be round. In some watches, perhaps, a diamond shape will suit better. In others the space may only allow of an ellipse. Carefully lay out the piece of tin foil.



How to make a mirror on your watch glass.

An Ingenious Key Ring.

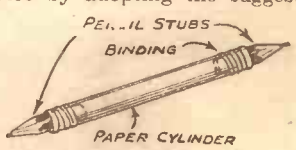
TAKE a clip A, cut off one end, and bend it round a small harness clip, B. Then bend the other end to fit over the belt, as at C. The belt must be threaded in the slot, in the manner shown. The device provides a secure key ring. By slightly varying the design, the device can be made to hold several keys, which cannot always be accommodated on an ordinary key ring. A length of spring about ⅛in. diameter makes a convenient key ring.



A simple and secure key ring.

Pencil Holder from Paper.

STUB ends of pencils may be made to give the maximum of service by adopting the suggestion illustrated here. Roll a cylinder of paper round the short pencils and bind them securely with a strip of adhesive tape.



How to utilize stub ends of pencils.

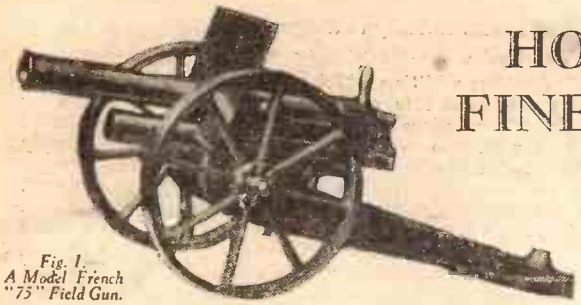


Fig. 1.
A Model French "75" Field Gun.

HOW TO BUILD A FINE WORKING MODEL ROCKET GUN

By H. White

THE season of gunpowder and noise is approaching, and as a variation from, or even in addition to, the usual firework display, some good effects can be obtained from a gun which will shoot the fireworks into the air before they explode. Not only is a double "bang" thus obtained, but much of the danger attaching to the use of some forms of firework is eliminated. Such a gun is termed a rocket gun, and it is an extremely easy yet effective device to make, as will be apparent from an inspection of the drawings on this and the next page. A few odds and ends provide the material, and only a modest amount of skill is necessary to make it. When finished it makes a fine ornament, quite apart from its use as a toy.

The Ammunition.

The same remarks apply to making a model cannon on the lines illustrated in the sketches herewith. The main idea of the model is to use small rockets or squibs as ammunition. The gun is simply a tube which holds them while the fuse is lighted. The model projectile is placed with the issuing charge to the rear and the reaction hurls it forward. The squib or rocket is a form of exploding shell. When it reaches its destination it bursts, so that for every "fire" there are two incidents of excitement with entire absence of danger to the gunner or any object in front of the muzzle of the cannon.

The model cannon as shown in Fig. 3 cannot very well be charged with powder and a solid projectile which could do serious harm.

The model gun can be made of any size. This is simply a question of expense in the matter of ammunition. The average halfpenny squib measures something under half an inch in diameter outside its cardboard casing. The diameter of this tube must therefore form the basis from which the gun is built. A piece of solid-drawn brass tube, $\frac{5}{8}$in. outside diameter, should therefore meet the case. The length is important. This should be at least 16in., making the model more like a long naval gun than a short field gun, such as that illustrated by the photographic illustration (Fig. 1).

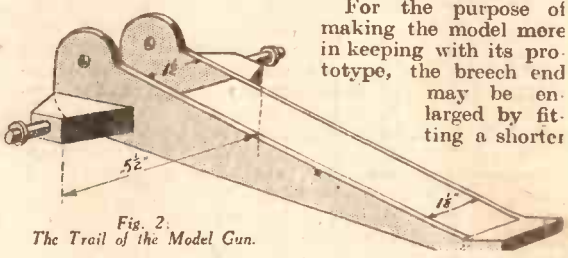


Fig. 2.
The Trail of the Model Gun.

For the purpose of making the model more in keeping with its prototype, the breech end may be enlarged by fitting a shorter piece of tube of larger diameter over the main tube, as shown in the drawing. This outer barrel should fit as tightly as possible on the inner one, and it may be secured by a few screw pins and soft solder. If screws are employed care should be exercised in filing off any internal projections to leave the inside of the bore quite smooth. There is, however, So long as the ends are squared off, the breech end more no need to proceed further with the gun barrel itself, particularly, the other parts may be prepared ready for the final assembly. Unless the model is intended as a specimen of model-making skill, the rest of the job may be made out of wood, except for odd pieces of metal for the breech work, and possibly the model hydraulic recoil cylinder under the barrel. If the model is considered solely from the point of view of a working gun then wood is quite good enough. As an example of model work there is no end to the amount of work that may be put into it.

The Recoil Cylinder.

The recoil cylinder is employed in the model just to

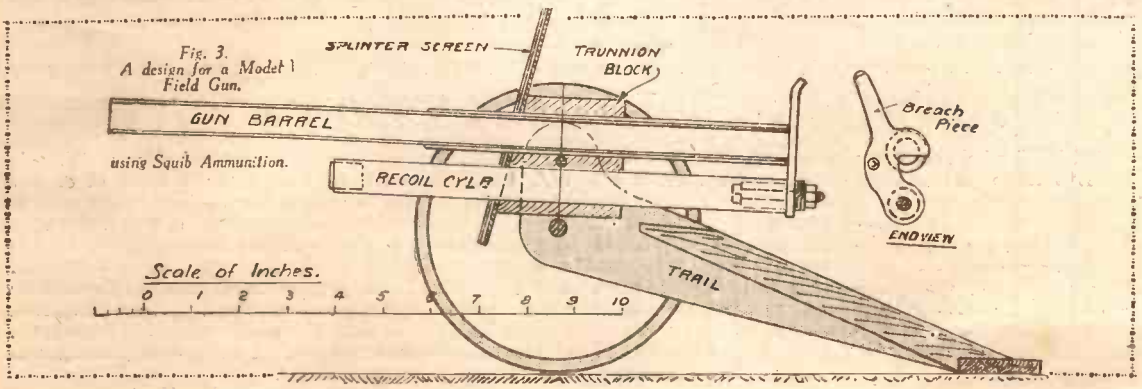


Fig. 3.
A design for a Model Field Gun.
using Squib Ammunition.

hold the breech mechanism. If of metal tube (⅞in. diameter like the inner barrel) a piece 9½in. long may be cut off and filed up square at the ends. Both ends may be plugged. The front plug need only be a piece of wood, but at the rear end the plug should be of metal, drilled so that a small bolt and nut to hold the sliding breech piece may be fitted to it as shown. The head of this bolt should be soldered in place, or if means of tapping a hole in the plug are available then a stud may be used instead. At any rate, it should be made so that it is possible to tighten up the outside nut. Between this nut and the breech piece a couple of double spring washers should be inserted, to provide a certain amount of resistance to the movement of the breech.

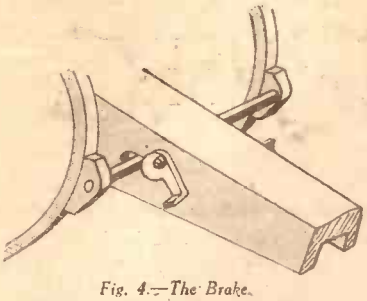


Fig. 4.—The Brake.

Both the main barrel and the recoil cylinder are fitted to a trunnion block. This may be a piece of hard wood arranged with the grain running the same way as the barrel. Beech is the best wood to use for this part. On the front of the block, which, by the way, is inclined, is nailed or screwed a "splinter screen" of thin three-ply wood.

Fig. 5.—The Trimming Block.

The trunnion block fits between the forks of the trail. This can be made up out of two pieces of stout plywood screwed securely to a tapered centrepiece. A bolt with a fly nut connects the two parts. The elevation of the gun can be altered by unslacking this nut.

The Wheels.

As to the wheels, once again arises the question of how far the model is to proceed towards realism. If the main idea is a working model, then any wheels about 6in. diameter will do. I suggest the rubber-tyred front wheels of a push-cart, or any other suitable wheels from a toy vehicle. For a showcase model the builder can, of course, copy the construction of a proper artillery wheel to any degree of completeness that is within his skill. The axles may be attached separately each side to the trail in the manner indicated in the diagrams, or a through axle made of ¼in. diameter. Whatever arrangement is used, it is necessary to arrange that the wheels are spaced at least 5½in. or 6in. apart to give a satisfactory lateral stability to the gun.

The Brake.

Another addition which will be found useful as well as ornamental is a brake. This may be made by threading a piece of rod through the trailer in a slotted hole with two cam levers, one on each side, to apply the brake blocks to the tyres of the wheels.

In conclusion, just a word about working the gun. The principle is illustrated in its simplest form in Fig. 3. Here the gun barrel is blanked up except for a small hole. When I had one of these guns, years ago, special ammunition was made with a mouse-tail fuse like that of a Chinese cracker. The small hole in the breech could then be used. The only drawback to the scheme was that without a removable breech cap it was difficult to thread the fuse through the small hole at the end, the gun, of course, then being a muzzle-loader.

As I have suggested making the model the breech can be swung on one side for loading and to suit the fuse of an ordinary "squib" or "devil." The firework in which the "fizzing" period, before the explosion, is short will be the best for the job.

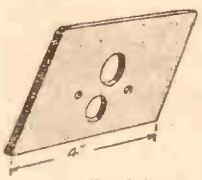


Fig. 6.—The Splinter Screen.

After loading the gun and adjusting the breech piece to allow just the right amount of fuse to project, light the latter, and as soon as the "fizz" has started knock down the breech. So that the breech piece shall work within limits and when knocked down will close the end of the gun, a small stop screw is arranged in it as shown in Fig. 3. It will be noted that in this drawing the hand lever is shown horizontal, not vertical, as on the main drawing. It may be better to knock down the breechpiece rather than to move it sideways.

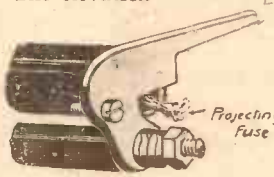


Fig. 7.—The Breech Mechanism.

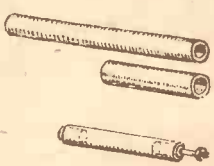


Fig. 8.—The Barrels.

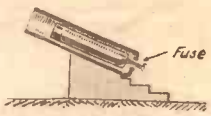
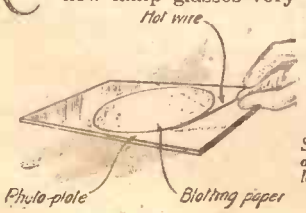


Fig. 9.—Explaining the Principle of the Rocket Gun.

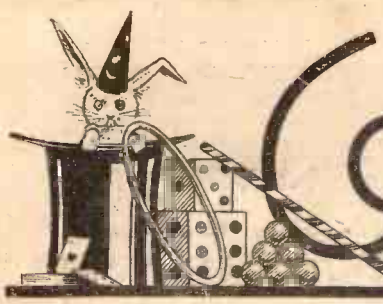
With the field gun mounting for which the gun is designed, the use of the brake will give the gun stability when firing. The spade end of the trail may also be drilled with a hole so that the gun can be pegged to the earth. A long garden or a field is, of course, the proper place to work the gun. It is certainly not a drawing-room toy, or one which should be fired in the public street.

Cutting Lamp Glasses

CYCLISTS who are also photographers can obtain new lamp glasses very cheaply by stripping off the film from old plates, by the simple expedient of soaking them in warm water, and cutting the glass to size. This is done very easily by first of all cutting a disc of blotting-paper of the required size, wetting it and sticking it on the clean plate; a piece of copper wire is now heated to redness and applied to the edge of the disc. This will cause a small crack, and if the wire is guided round the edge of the blotting-paper disc it will be found that a circular crack is left behind. Naturally it will be necessary to reheat the wire once or twice before the circle is completed. When completed a sharp tap will release the circle, which, if necessary, can have its edges smoothed on emery-cloth, or against the edge of a fine grindstone.



Simple method of cutting cycle-lamp glasses from old negatives.



Simple Tricks Which YOU Can Do!

CONJURING

By A. COLLINS.

WE have all, at one time or another, heard of the expression that "the quickness of the hand deceives the eye." It is a catch-phrase which is accepted by a number of people as sufficient explanation for any magical effect that the conjurer can produce.

The first thing you must learn in conjuring is palming. By that expression I mean that a small article, such as a coin, is gripped in the palm of the hand in such a way that the hand appears to be empty.

I will now describe one of the commonest forms of palming.

Take a coin in the right hand between the thumb and forefinger, and with the left hand make a motion of grasping the coin, the thumb being underneath and the fingers above (see Fig. 1). As you close your left hand, relax the pressure on the coin, letting it fall into the palm of the right hand, at the same time keeping your eyes fixed on your left hand to give the impression that the coin is in that hand. You then open the left hand and show your friend that the coin has disappeared.

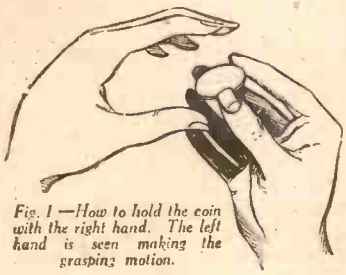


Fig. 1.—How to hold the coin with the right hand. The left hand is seen making the grasping motion.

The best way to practise this trick is to do so in front of a mirror, at the same time remembering the following points:—

(1) When you appear to grasp the coin in your left hand it should be closed immediately.
(2) You must keep your eye on the left hand to give the impression that the coin has been transferred to it.
(3) The right hand, after retaining the coin, should drop to your side without attention being drawn to it.

A Simple Card Trick.

The following simple tricks are performed with an ordinary pack of playing-cards.

To prepare the pack in readiness for the trick, place all the red and all the black cards together. You then ask your friend to select a card, at the same time holding the pack so that he takes it from amongst the red ones. Then tell him to replace the selected card, but this time hold the pack so that it is replaced amongst the black cards. Upon glancing through the pack you will easily discern the selected red card from amongst the black ones.

The Turned Card.

Ask your friend to select a card and while he is looking at it face the bottom card of the pack and turn the pack over. You will now find that owing to the bottom card being faced, the pack, while appearing the same, has been reversed. Then ask your friend to slip the chosen card into the pack, taking care that the pack is carefully squared so that the cards do not overlap. A handkerchief should then be placed over the cards, and under cover of the latter, reface the bottom card and turn the pack over so that it is once more in its original position. Upon glancing through the pack the chosen card has apparently turned itself over.

Producing a Chosen Card.

We now come to something slightly harder. For this trick prepare a discarded pack of cards in the following manner. Clamp the pack between two pieces of wood or a vice if available, leaving exposed a small margin on one side of the pack. Then sandpaper the exposed edge until one end is slightly narrower than the other. Now ask your friend to select a card, and while he is glancing at it turn the pack round. When the card is replaced you will find that it will protrude slightly (see Fig. 2). Shuffle the cards well, place them behind your back and run your fingers along the edge of the pack (see Fig. 3). You will then find the selected card.

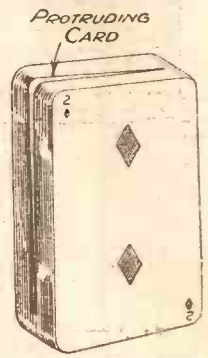


Fig. 2.—The pack, showing the protruding card.

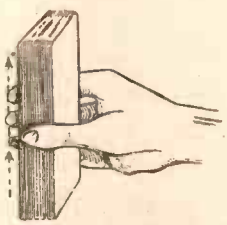


Fig. 3.—Run your fingers along the edge of the pack in the direction of the arrow.

Miscellaneous Tricks.

For this trick you will require an ordinary match-box and two match-sticks. Place one of the match-sticks on the box (see Fig. 4) and hold the other match between the thumb and forefinger of the right hand. The trick is now ready, and you proceed to make the match leap from the box by gently touching it with the other match. To accomplish this, when touching the match on the box, flick the match in your hand with the nail of your middle finger (see Fig. 5). After practising this trick a few times you will find it quite easy.

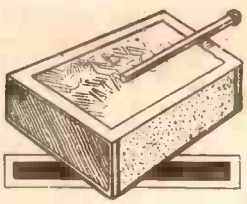
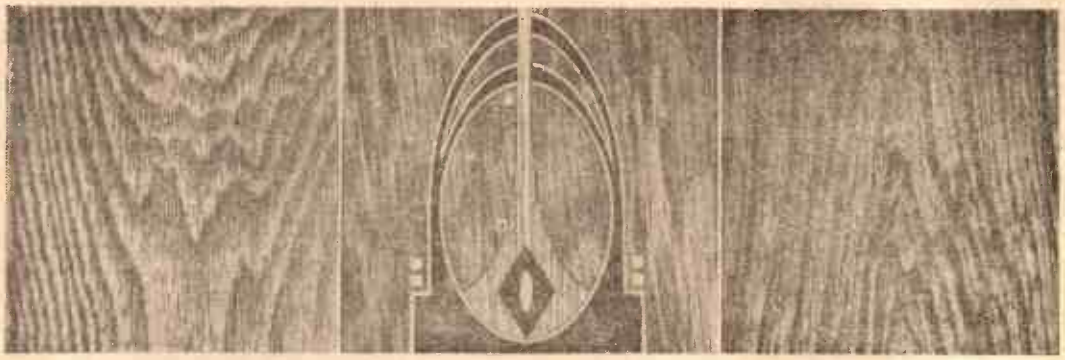


Fig. 4.—Showing the position of the match when placed upon the match-box.

Fig. 5.—Showing how to flick the match with the middle finger.

(Continued on page 80.)

Veneering and Graining with Transfers



NOT many craftsmen are aware that quite common woods may be made to look equal to good quality timbers by means of transfers. Transfer graining paper is easily applied to even common packing-case wood, and by suitable polishing, the finished wood cannot be distinguished from the genuine wood.

The illustrations at the top of this page show some three-ply wood of quite poor quality which has been treated in this way.

Transfer Veneers and Inlays.

These are slightly different from transfer graining paper, it is slightly more expensive and it is therefore used only for small areas, such as panels or ornamentally shaped inlaid effects.

It is actually a solid veneer in transfer form, and is applied with varnish or cement. Where cost is not the primary consideration, and the area of surface to be covered is small, it can be used with beautiful effect.

Inlays are another step beyond the transfer veneers, in that they are reproductions of actual wood inlay designs. There is nothing cheap about a transfer inlay except the price. The result obtained is better than the average real inlay, and is more permanent.

Carried out on the same principle as the inlays described above, it is possible to reproduce upon practically any article, designs equal to hand painting.

Transfers are also obtainable giving effects as previously described, but which can be applied to any kind of fabrics, the design becoming incorporated in the fabric, so that the result is permanent, wearable and washable. For decorating wearing apparel, lampshades, cushions and other articles, it is superior to hand painting.

Trade sign transfers.

A range of transfer designs suitable for decorating trade vans, trade signs, shop fronts, etc., such as pigs, cows, sheep, etc., for the meat trades; sheaf of wheat, loaf, etc., for bakers; basket of flowers or fruit for florists and fruiterers. These designs are very effective when applied to glass signs and illuminated from behind.

Anyone can re-enamel a cycle, but re-lining it is another matter, and it is very doubtful if any ordinary person has ever had the skill to attempt to renew the gold and coloured lines which mean so much to the appearance of the cycle. For 10d. anyone can do it!

A complete set of all the panels and lines needed in gold and colour in the form of transfers can now be obtained, and it is an easy matter to apply these to the re-enamelled cycle by following the simple instructions issued with the set of cycle lining transfers. And when making up your models remember that imitation brick paper will enable you to simulate real brickwork.

CONJURING—(*Continued from page* 79.)

The Mysterious Handkerchief.

For the following trick you will require an ordinary silk handkerchief. (In conjuring a silk handkerchief has a natural tendency to help the conjurer because of its extreme compressibility.) Proceed to roll the handkerchief into a compact ball and to conceal it in a fold of the coat sleeve inside the elbow (see Fig. 6), the left sleeve for preference. You now pull up your sleeves to show your friends that both hands are empty. In pulling up the left sleeve your hand comes over the concealed handkerchief, and while attention is being drawn to your empty left hand, palm the handkerchief with your right. Your two hands are then rubbed together and the handkerchief allowed to appear slowly through your fingers, giving the impression that it has been produced from nowhere. Practise this a few times before trying it on your friends.

Fig. 6.—Showing how the handkerchief is concealed in the sleeve.

My last trick is one more idea for the production of a silk handkerchief. A candle is placed in a candlestick on the table, and a box of matches half open is placed beside them. In the empty space at the back of the match-box a silk handkerchief is placed (see Fig. 7). You now show both hands empty to your friend, then pick up the match-box and light the candle. As you close the match-box the handkerchief is pushed into the hand. Hold your hand in front of the candle and let the handkerchief expand, giving the impression that it has been produced from the rays of the candle.

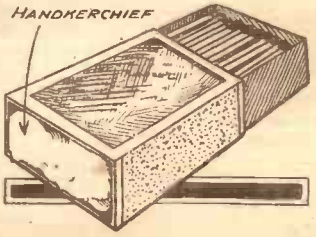


Fig. 7.—How the handkerchief is hidden in the end of the match-box.

A SIMPLE HOME-MADE TELEVISOR.

By means of this instrument you will be able to receive the Broadcast pictures.

THE television receiver (Televisor) described below, although not of a very elaborate nature, will enable anyone to receive quite good images from the present television broadcasts, provided they possess a good Three-Valve Wireless receiver, working from a Mains Eliminator delivering about 200 volts H.T. Dry batteries are unsuitable.

The simple Televisor described in this article.

The Scanning Disc.

The most important part of the instrument is the Scanning Disc. This can be constructed of either cardboard or aluminium, and although cardboard is the cheaper, it has the disadvantage that it is not very rigid unless fairly thick, and the disc should be as light as possible in order that it may be rotated easily. It is, however, much easier to mark out and cut. Whatever material you decide to use, mark out a circle 20in. in diameter, and with the aid of a Protractor and dividers mark out thirty lines each 12degs. apart (Fig. 1). Now mark one of these lines with the figure 1 as a guide and along this line make a dot (with a finely pointed pencil) exactly 9½in. from the centre. On the line immediately above this make a dot 1-30th of an inch nearer the centre, and carry out this procedure on each line, each succeeding dot being 1-30th of an inch nearer to the centre than the last. This gives us a spiral of thirty dots, the outer one being 9½in. from the centre, and the inner one 8½in. from the centre. Now obtain a sharp nail (or better still a leather punch), having a thickness of 1-30th of an inch and very carefully punch a hole at each of the dots. This must be done very carefully, as the sharpness of the detail of the received image depends on the accuracy with which this part is done.

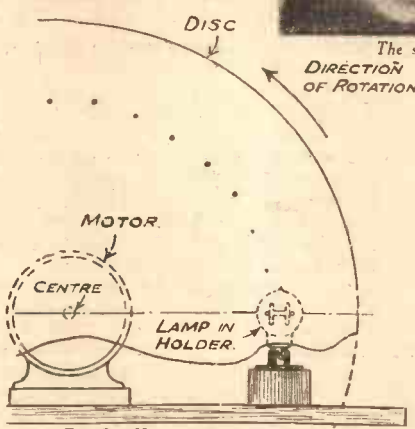


Fig. 2.—How to mount the Neon lamp.

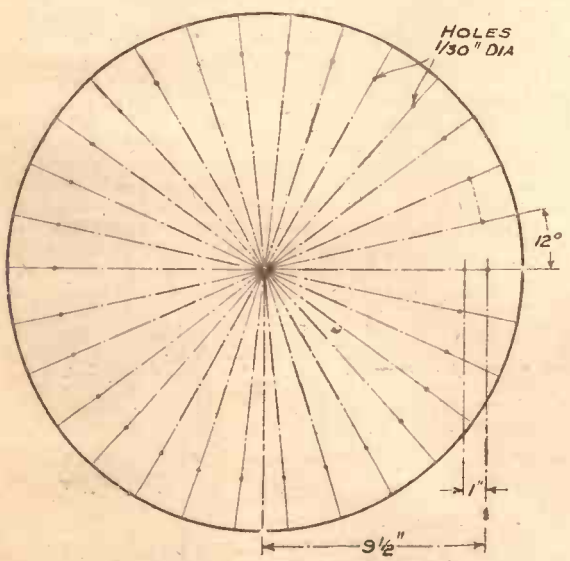


Fig. 1.—How to mark out the scanning disc.

Mounting the Disc.

The finished scanning disc has to be rotated at 750 revolutions per minute, and for this purpose it is preferable to mount the disc direct on to the spindle of a small electric motor. It is possible, however, to suitably gear a Meccano motor, or to use an electric fan (with the fan, of course, removed). Whichever method of rotation you decide to use, make sure that the whole thing is mounted solidly, and that there is no shake transmitted to the rotating disc, as this will spoil the clarity of the image.

The next part of the apparatus is the Neon lamp, and for this purpose an Osglim Night Light (of the Beehive pattern) or an Osglim Letter Lamp (preferably the letter "H") can be quite effectively employed. A holder to take the lamp is next wired up, the two wires being taken to two ordinary terminals spaced about 2in. apart on a small strip of ebonite, and the lamp-holder is mounted on a piece of wood so that the centre of the bulb of the lamp will be in a line with the spindle of the disc, and directly behind the row of holes (see Fig. 2). The lamp should be mounted as close as possible to the disc, so as not to lose too much light.

To enable you to see the picture more clearly it is preferable to mount a large reading glass or other magnifying glass in front of the disc, and to mount a piece of cardboard (having a piece cut out 1¼in. by 2½in.) between the lens and the disc. This cuts off all extraneous light and makes the image stand out.

(*Continued on page* 100.)

Fig. 4.—How the type is set in the formes.

BE YOUR OWN PRINTER

(Concluding Article).

How to Use the Printing Press.

WE have made our press, and now comes that part of the work which we are no doubt anxious to commence, namely, the actual printing. Your first efforts may not be a success, for, like other things, it is "not so easy as it looks." However, practice will make perfect, and if the remarks I am about to make are carefully followed, the small skill required will soon be acquired. Once you are able to print a fair copy you will progress, and your work will improve until you will find that you can tackle more ambitious things.

Type.

All type is made to standard size as regards height to paper. The letters themselves take various forms and sizes, and there are a number of styles to choose from. At the moment I will merely state that there are CAPS, that is, capitals, and "lower case," that is, the appropriate smalls. The matter of type can be gone into fully when we have mastered the art of printing something. Type can be obtained from any founder by the pound or by the font, which consists of a given style with all the caps, smalls, numerals, and signs, in appropriate quantities. For our use, to commence, we might get an assortment of discarded type, and classify it ourselves. This can usually be had from the local printer.

Setting Up.

Now we can consider the work of setting up, which amounts to setting up our type in the forme or chase. Remember that all the work is done backwards, and start on something simple such as an address or visiting card. Balance is the first thing to consider. The type must not be all over the place, but lined up at the edges with everything well proportioned. Then the ultimate work will look neat. Before we commence we shall need some furniture, wh ch consists of wood packing pieces of standard size, reglets to use between the lines of type, and side-sticks and quoins. To make all this clear I have shown in Fig. 4 how the type is set, with packing blocks, reglets, side-pieces and quoins. A stock of these is required, the side-pieces and blocks being of one length to suit the chase. Starting from the top, we set our pieces, setting each line of type with blank type spacers between each word, and line spacers between each row, and finally pack up at the bottom, thus filling the chase. This must be done with the chase on a flat bed, and the bed of the press can be used for the purpose. All the furniture as required, by the way, can easily be made of oak wood.

Levelling.

This operation is a very important one. At the present stage the tapered quoins, which must all be cut to uniform and standard taper, should just hold the "set up" in position. The chase is in the bed of the machine. Now take a piece of good, flat oak wood measuring 10ins. by 8ins., and place this over the type. Gently tap this in all positions with a wood mallet, and this will ensure that all the type is sitting perfectly on the bed of the machine. Tap the quoin pieces to get a firm grip, and then level up again. Make sure that this is well done. The chase, by the way, should just fit in the bed if the dimensions given have been carefully followed, allowing 1-32in. clearance all round, and this should also be rigid. If not it should be packed in with a strip of card at each side.

Getting An Impression.

Before we attempt to take a number of pulls we must get a perfect specimen impression. First of all register the position of the print on the pressing plate. This is set by the simple expedient of using three drawing pins, and the paper is set in position and held by the spring gripper. This part of the work is clearly indicated in Fig. 5. Do not, however, place your paper or card to be printed direct on the face of the pressing plate. It must first be packed up with card, which must not measure more than 10ins. by 8ins. The cards should be thin and have a good surface. Try first using one card, and add a card until the best impression is obtained. This is the art of getting just the right even pressure all over the type-setting; insufficient cards will make a poor impression, while too many cards will make an uneven impression. The packing must be just right, and the thickness of the print card or paper must be taken into consideration.

Printing.

At last we come to the printing. Assuming that you have set everything right, prepare your inking plate. A small tin of ink will go a long way, and can be obtained either from a manufacturer or from your local printer. The ink should be dabbed on the plate evenly all over and then rolled in with a roller. Rollers such as photographers use will serve, of suitable size, or alternatively, you can easily make one. This item is shown in Fig. 6. The ink must be applied to the plate thinly and rolled perfectly even, otherwise you will get too much ink on your print in one place, and not enough in another. Now, close the press, run your roller over the plate,

(Continued at foot of page 83.)

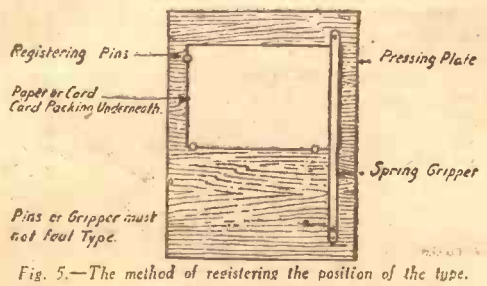


Fig. 5.—The method of registering the position of the type.

DISTORTION PHOTOGRAPHS

By Owen Wheeler, F.R.P.S.

PERSPECTIVE distortion is a frequent source of trouble with beginners, and is caused by using a lens of too short focus for objects at a very short distance, with the result that things close to the camera are unduly exaggerated.

"Tilt" Distortion.

In photographing a tall building you have to tilt your camera, sometimes quite a lot, in order to get the top of the building into the picture. Thus, lines at the sides of the photograph, instead of remaining, as they should, parallel like the supports of a capital H, begin to converge like the strokes of an inverted V(Λ). This convergent distortion, as it is called, is a very troublesome defect indeed, and in many cases it can be rectified during focusing by the use of a swing-back or a swing-front, such as is commonly fitted to stand or hand-or-stand cameras, but is seldom found in roll-film models. If the building is not a tall one, but still comes too far down on the screen when the camera is level, the rising front, which even roll-film cameras should possess, may bring up the roof sufficiently, but in all photographs of lofty architecture, convergent distortion has to be reckoned with when the sides of the building are near the edges of the plate. In the illustration it is shown in a fanciful form with extraordinary results. If you want to avoid this beware of tilting your camera in all architectural work, unless you have learned to use a swing-back or a swing-front as it should be used to correct the effect of a tilt.

Marginal Distortion.

If your lens is double or triplet you will not be troubled with this, as the distortion of marginal lines due to the uneven thickness of a single lens will have been corrected. A single lens, which is thicker in the middle than it is at the edges, must distort, and, although the distortion may not be noticeable in a landscape, it will be painfully evident in the case of a building which nearly fills the plate. Marginal distortion is of

A distorted picture of a house.

two kinds, which can be simply explained by imagining that a square or rectangle is being photographed with a single lens, so that it nearly fills the plate. If the lens is of the usual focal length for that size of plate one of two things happens, according to the position of the diaphragm or stop which is fitted to all ordinary photographic lenses. If the stop is in front of the lens the edges of the square or rectangle will bulge out barrel-wise, and, with the stop behind, they will be drawn in like the sides of an old-fashioned pincushion. Barrel and pincushion distortion have, therefore, been adopted as descriptions of this defect. The illustration was purposely taken with a single lens in order to give an indication of this defect. It will be noticed that the roof is slightly bowed, and that there is curvature of the lines at the base. But that is nothing to what a single lens *can* do in the way of barrel distortion. If yours is a single lens, and you want to photograph a house with it, make the house as small as possible, and keep it well away from the edges of the picture.

BE YOUR OWN PRINTER—(*Continued from previous page.*)

open the press, set your paper, run the roller evenly over the type with a swift movement, once forward and once back, close the press again, apply hand pressure, and open the press, and you have your impression. Before opening the second time ink the roller ready for the next print. As regards pressure, you will no doubt find this differs for the best results, and the amount to apply will come natural with practice. In many cases the weight of the pressing plate alone will suffice. You are now free to take as many impressions as you like, and you will find that you will be able to do a considerable number in an hour, and once you have learned to do it properly you will be a real printer, and the work will be real, too, thus you can do all your own work, letter headings, cards, and so forth, and even school magazines.

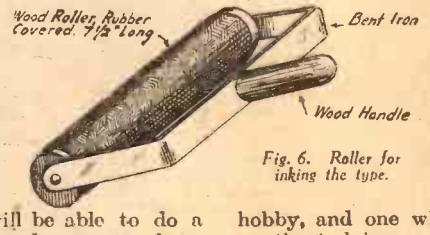


Fig. 6. Roller for inking the type.

There is still much more to consider, such as ornament, various aids to working, such as composing-sticks, making type cases, and so forth, and I hope to continue with these matters in due course. In the meantime you will have much to do, and much to practise with, but you will have started on a really interesting hobby, and one which is useful, instructive, and well worth studying.

A GRAMOPHONE OR WIRELESS TABLE

A fretsaw and a few carpentry tools are all you need to make this practical table. It has a drop front and an interior cupboard space for records or wireless accessories. Built in oak quite simply from the patterns on the gift design sheet and a parcel of wood supplied by Hobbies Ltd. Read the construction hints and see how simple it is.

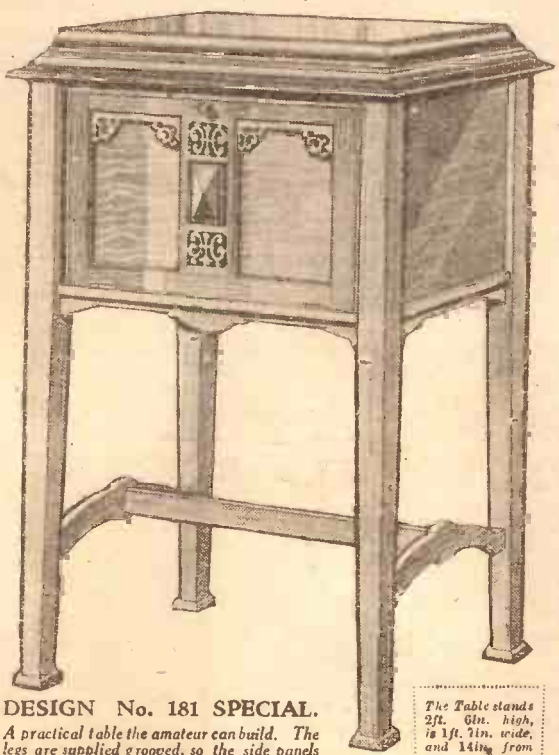
THIS week we give another of those everyday pieces of furniture which any handyman who loves to use carpentry tools will delight in making up. The table illustrated below serves a dual purpose, for it can be used either as a stand for the gramophone or the wireless set, being particularly applicable to either because below the table top we have a cupboard intended to hold either the records for the gramophone or the batteries and usual accessories of the wireless set. The door of this cabinet is fitted as a drop front, so if the table is used for gramophone records they can be stored inside and yet drawn forward as required to have them handy for transferring to the machine.

The Wood to Use.

The whole table is built in oak, and, to save the worker trouble, Hobbies Ltd. make up a parcel which contains planed boards of the necessary thickness, the four legs, and the mouldings and turnings. The construction of the table is made the more simple by the chart presented with this issue containing patterns—in most cases full size—which can be easily pasted down to the wood. When the parcel of wood has been obtained, check off the various parts required with the patterns to know exactly how each part is got out.

All Quite Simple.

The construction is made more simple by legs which are already grooved to take the sides forming the cabinet portion of the table (see Fig. 1). Fig. 2 shows very clearly the general framework of the table with the sides and floor added. By sliding the side panels into the grooves of the legs, and adding the floor, we save all the trouble of cutting mortise and tenon joints.



DESIGN No. 181 SPECIAL.

A practical table the amateur can build. The legs are supplied grooved, so the side panels merely have to be glued in place. The top is 15½in. long by 10½in. wide—particularly suitable for any wireless set or gramophone

The Table stands 2ft. 6in. high, is 1ft. 7in. wide, and 14in. from back to front. Fitted with drop door.

The Legs are Grooved.

The actual construction of the table is obvious to any amateur carpenter. We should work with the legs in pairs, completing each end of the table, and then joining them together with the long parts of the back and front. Before commencing, lay the legs together and mark off 1½in. from the bottom end. Saw this away and mark up 5in. to indicate the position of the mortise joint B. This is 1in. long and ⅜in. wide, and having cut it we can fit it in the cross rails to each of the two pairs of legs. At the top end of the leg the side of the cabinet (measuring 10½in. wide and 9½in. high) is cut square and pressed into the groove of the leg. The top edge is flush with the top of the leg. Thus we have two complete ends (see Fig. 3).

Construction Hints.

To join these ends we get out the rail above the door, the back (a large piece 15½in. long and 9½in. wide) and the rail connecting the two pairs of legs at the bottom. The cross rail above the door and the back are fitted with the top edge flush with the top of the legs, whilst the rail at the bottom is mortised into the cross rails of the framework. Have the floor ready when these parts are put together to slip in place under the side panels. By gluing and screwing from underneath, the floor helps to hold the whole framework rigid. The quarter pattern of the floor on the design, by the way, can be used to complete the whole rectangle. Little pieces are cut at the corners to allow for the projection of the leg. The four rails beneath the floor fit exactly between the legs, and cover the end of the groove.

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Fig. 1. The legs supplied are already grooved.

The Door.

The door is of plywood built up with two imitation panels by an outside framework of four rails and a centre cross rail with fretted ornamentation. The two long rails are glued between the end rails, and finally the centre rail (with its fretted top and bottom) is glued between. The diagram at Fig. 4 shows the door with one of the end rails omitted. The centre rail has an oblong cut from it and this recess serves as an opening for the oak ornament (No. 214) supplied with the parcel or obtainable independently from Hobbies, Ltd. The door panels are also further decorated by two drop pieces of ornamental fretwork cut in ⅛in. wood fitted close up under the top rails.

Before fitting the door, put in the two jambs by sliding the strips of wood shown into the groove between the top rail and the floor. Before doing this, however, glue on a shaped bracket (in the position shown by the dotted lines), immediately behind the jamb and flush with its edge. The exact position of the jamb with the detail of the bracket is given at Fig. 5. The door is hinged to the floor, and a recess for the flaps is cut in the lower edge. At the top in the centre rail is the ornamental catch (Hobbies, No. 5386) which keeps the door shut by having a little indentation made on the underside of the top rail. The door is prevented from falling forward too far by two brass angle stays. One plate of this stay is fitted to the bracket glued behind the jamb. When this is fixed hold the door open flat, and then screw down the other plate of the stay where it falls (see Fig. 6).

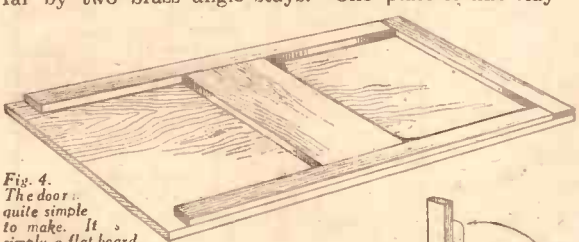


Fig. 4. The door is quite simple to make. It is simply a flat board with panels.

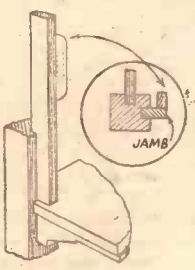


Fig. 5. The door stile fitting into the leg, with the angle bracket support.

The Lid and Sides.

For the lid we have to build up a framework of two lots of moulding and a plain top. The ornamental moulding supplied makes up a flat frame and a hollow frame into which a plain top is sunk. The flat frame (made of four pieces of No. 41 moulding) is strengthened at the corners by angle blocks cut from ⅜in. wood. This hollow frame, which should measure 19 x 14in., is laid over the top of the cabinet and glued and screwed to the sides and legs. Two pieces of the cornice moulding (No. 44) 17¼in. long and two pieces 12¾in. are mitred at each end and then glued together. For this cutting, a rough mitreing block must be made up so that the moulding fits exactly between the insides for the sawcut to go across at an angle of 45° (see Fig. 7). This framework of moulding has a sunk rebate in it for the top of the cabinet—a plain piece of ¼in. wood, 15½in. long and 10½in. wide. It is glued in the recess, and the whole thing turned over for blocking pieces underneath in the angle.

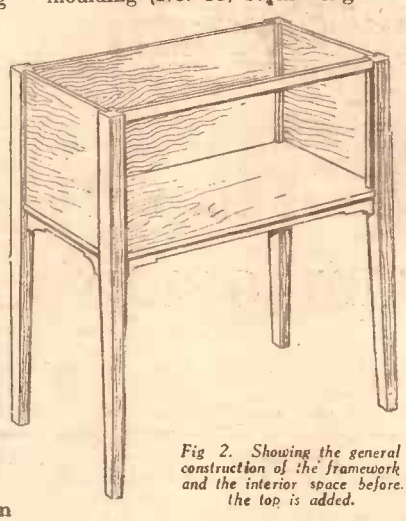


Fig 2. Showing the general construction of the framework and the interior space before the top is added.

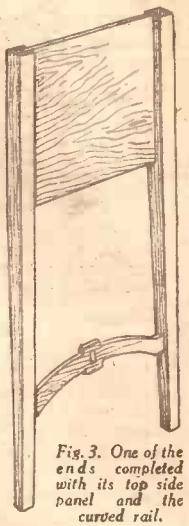


Fig. 3. One of the ends completed with its top side panel and the curved rail.

This complete top is glued to the frame already fixed to the legs, and shaped angle fillets put inside to give greater strength. The weight of any instrument is on this top, so its construction should be strong and secure. The feet are composed of four small blocks rounded off as shown by the section on each pattern. Before gluing them under each leg, stand the table on a level floor to see it is steady. If not, a shaving can be taken off the legs as necessary.

The finished table, being in oak, can be stained to a Jacobean shade by the use of Hobbies spirit stain. This will bring all the wood down to one colour, and it can be left either with a dull gloss or given a professional French polish finish by the use of Hobbies Lightning Polish.

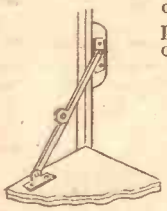


Fig. 6. Showing how the brass angle support is fixed to hold the door open.

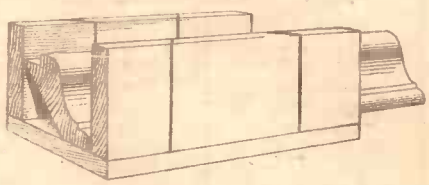


Fig. 7. This rough mitre box is made to cut the angles of the sloping moulding (No. 44).

Take care, in the finishing, to obtain an even effect, otherwise the beauty of the grain will be destroyed.

The cabinet will accommodate standard wireless panels, and is sufficiently roomy to allow a good clearance for the various components; as a gramophone cabinet, it will take the deepest motor.

HOW TO OBTAIN THE WOOD, ETC.

Parcels of the necessary boards and the fittings are supplied by Hobbies Ltd. as shown below.

Planed boards of oak. Four grooved legs (No. 39). Lengths of No. 41 and 44 Moulding and a wooden ornament (No. 214) Price 16/- complete (Carr. Forward).

A polished black erinoid door catch (No. 5386) 4d. Two brass door stays 1/- each. Pair brass hinges 4d. Postage 2d. extra.

A COMPLETE PARCEL OF WOOD AND FITTINGS FOR 18/8.

CUT OUT THIS MANTEL CLOCK

with a fretsaw

THE handyman with a set of fretwork tools will find no trouble in making up the Mantel Clock illustrated herewith, and when built in oak and finished with a polished surface, it will be worth quite double the actual cost of making. All the parts are small, and in no instance is there any intricate work to be undertaken. In consequence, the clock is easy to build and as a parcel of wood is supplied by Hobbies, Ltd., containing the necessary boards, the worker can get right ahead. The patterns of the various parts concerned are printed on a design sheet (No. 180 Special), which is given away with the 1931 Hobbies catalogue. Against each of the patterns is the name of the part concerned, the thickness of the wood in which it is required, and its position in the general scheme of things.

The Wood Costs 4s. 3d.

The clock can be very well built in almost any common fretwood, and when completed stands 10¼in. high and 12¼ins. wide. It is fitted with a reliable clock movement obtainable either for a daily winding (30-hours) or for a whole week (8-days). The cost of the wood supplied is only 4s. 3d., whilst particulars of the two clocks are mentioned at the end of the article. The oak supplied is planed ready to use, and having obtained the parcel we can check off the various parts with the patterns on the design. These patterns are pasted to the wood with the grain running in the direction indicated by the arrow, and when the paste is dry the work of cutting out is commenced with the fretsaw. When the parts are cut each has to have the paper remains cleaned off with sandpaper until the wood is clear. See that no burr of the saw is left on the inside of the cutting, and be careful wherever joints come not to sandpaper the wood thinner than it should be. All the parts as they are cut should be tested out with each other into the general building of the clock, and if we proceed in accordance with the instructions to follow, we can complete the clock case as we go along.

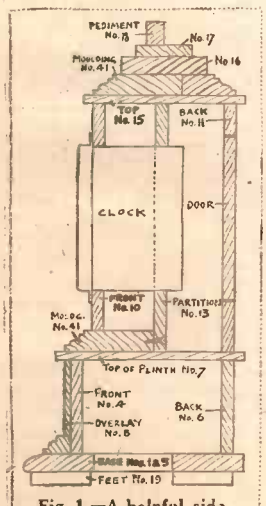


Fig. 1.—A helpful side view, showing position of parts numbered as on the design sheet.

Straightforward Work.

As can be seen from the illustration, the timepiece is built on a shaped base with a decorated plinth above. This forms the platform from which the body-work of the clock raises itself, and finally a pediment at the top provides further decoration and gives a fitting finish. A good idea of the actual construction is given at Fig. 1, which is a side view of the clock cut right through the centre.

The Construction of the Foundation.

Let us, therefore, start with the base and get out the four pieces required to make the hollow frame. Parts Nos. 1 and 2 are glued together to form three sides of a rectangle, and then part No. 3 is glued between to complete it (see Fig. 2). The outer edge of the front and two sides has to be rounded off with a file and sandpaper to get the curve shown by the section on each pattern. The back is left square.

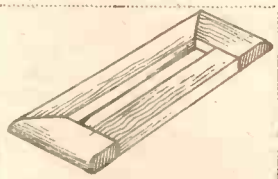
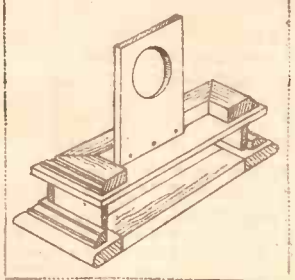


Fig. 2.—The starting point of the base—four pieces forming a flat rectangle and two mitred corners.

Now get out the main front and two sides of the plinth itself (Nos. 4 and 5). Cut them and stand them in place on the flat base and fit between at the back, the part No. 6—the back of plinth. Before actually glueing them down, mark on the base the position of these three upright pieces, and then cut three lengths of the small (No. 21) moulding so that it lies round in the outside angle (see Fig. 3). Lay the moulding in its position and mark off with pencil to ensure a correct length. Two short pieces lay along the sides of the plinth, and a longer piece along the front. The two short pieces are mitred at one end only so that the back end is $\frac{3}{16}$ in. inwards from the edge of the base. Glue the moulding

Fig. 3.—The plinth on which the bodywork is built. The support for the clock case is seen in place.



in position and then put up to it the sides, front and back of the plinth itself.

The Bodywork.

Thus we have a hollow box, and a lid is put on by the top of the plinth (part No. 7), which not only lies flat, but is fixed securely by a mortise and tenon joint on the front at A. This platform serves as a foundation for the body of the clock, and we can immediately glue on three pieces of the flat ornamental moulding (No. 41), in the positions shown by the dotted lines on the pattern of the top. For the ends we cut two pieces 3½ins. long, and for the front we want one piece 10½ins. Mitre at the corners to leave the back end flush and glue on to the plinth itself $\frac{3}{16}$in. inwards from all the edges.

Supporting the Works.

The clock movement is put into the case through the front, but the barrel of the works projects inside so that a support must be provided to prevent it from turning or dropping. A clock support is cut therefore (part No. 13), and is glued and screwed along the back edge of the front piece of flat moulding we have just put in (see Fig. 3). Now we can fix the clock case itself. The two sides (No. 12), and the front and back (10 and 11) are cut to the pattern, cleaned up and butted together to form a hollow frame. The back has a projection which sinks between the flat moulding, and the ends of this part are covered by the side. The edges of the side, however, are covered by the front (see Fig. 4). It will be noted that a door is cut from the back before this part is fixed, and it is well to hinge the door and fix the catch (No. 5341) before the whole part is put in place. The ½in. hinges are fitted with ⅜in. screws on the two edges of the wood. Before fitting the front of the clock we should also get out the top of the clock case in order to test the tenon joint there (B), as well as to ensure that the hole we have cut for the clock case is large enough to take the actual movement we propose to fit.

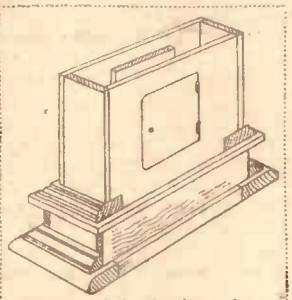


Fig. 4. A back view showing the construction without the top. The position of the parts is made quite clear.

The Ornamental Top.

We have so far completed the case as seen in Fig. 4. Now we can add the top of the clock case, but this should be completed before being finally glued in place. The finished top is shown at Fig. 5—the parts composing it are seen in the section at Fig. 1. Above the top of the clock (No. 15), a shaped rectangle is formed of four more pieces of flat shaped moulding (No. 41). As, however, the width does not allow the four pieces full size, the part which goes in at the back must be cut down so that it is not more than 1⅛in. wide. For the front piece a length 9½in. is cut, and has its ends mitred. The end pieces are 3in. long and also mitred. When these are glued in place it will be found that there is only room for the back piece if it is cut down as mentioned. The dotted lines on the top of the pattern show the position of these parts, and the detail at Fig. 6 is also helpful. Above these pieces of moulding we have two flat plain rectangles (Nos. 16 and 17), and finally a pediment piece cut from ⅜in. wood and glued on edge $\frac{3}{16}$in. back from the front and centrally between the ends.

The Fretted Overlays.

Various small overlays are the only parts yet to fix. They are all cut in ⅛in. wood. The side and front of the plinth each contain an ornamental overlay which is glued on the face of the wood and between the small moulding on the base and the underside of the plinth top. The front overlay covers up the edges of those on the end. A long strip (No. 14), forms an overlay to the front on each side of the clock face. This overlay is glued immediately beneath the projection in the top of the clock case—that is, ¼in. inwards from each end. Each overlay has a large opening in it to form a recess for the ornamental oak buttons which are supplied with the parcel. These add a distinctive touch to the work.

Finally, the clock is lifted by the addition of four square feet (No. 19). They are cut in ½in. wood and glued on the underside of the base $\frac{3}{16}$in. inwards from each edge.

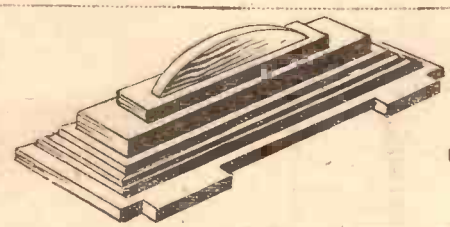


Fig. 5.—This is a perspective view of the top, showing the various boards and moulding which make it up.

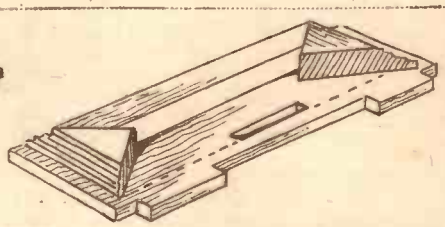


Fig. 6.—The first two layers of the top. The front piece of moulding is absent, to show how the narrow back piece fits in.

Strength and Finish.

The inside of the clock can be strengthened by the addition of small blocking pieces in any of the corner angles, and it is specially advisable to put a fillet along the angle where the clock support joins the top. This will provide greater strength. The grain of the wood looks quite well in its natural state, and many workers prefer merely to give it a rubbing of linseed oil to heighten the light and shade. Others may prefer to darken the whole of the work with stain and to finish it with a dull polish of waxine or furniture polish.

There are many excellent polishes on the market quite suitable for amateur use, but if you feel that your skill is not equal to a French-polish finish, use the oil finish already recommended.

ALL THE PARTS FOR MAKING

Design
No. 180 Special Design. Given away with Hobbies 1931 Catalogue. Or bought for 1/- independently (1/1 post free).

Wood
A parcel of Oak boards ready to cut, with the necessary moulding and ornaments, 4/3 (postage 9d.).

Clock
An 8-day Clock (No. 5504) 17/6. Or a 30-hour Clock 5503). 9/6 Hinges 1d., Door Catch (5341), 6d. (Postage 6d. ex.).

A COMPLETE PARCEL (WITH 8-DAY CLOCK MOVEMENT) 21/- OR 22/- POST FREE.

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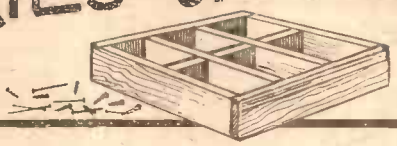
WHAT ABOUT NAILS & SCREWS?

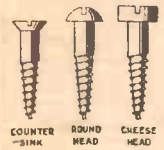


Here are some interesting little-known facts about these daily needs of the wood-worker. They will help you in buying and using nails and screws.

DO you realise that when you walk into a hardware store and ask an ironmonger for nails, he wonders which kind out of over three dozen it is you want? Or if you just ask for screws, there are at least five very common kinds? He will think more of you if you can say just what you want, and every handy-man should try to remember those he is most likely to require. Of the nails there is no need to memorise all the various kinds, because this includes such special kinds as gate nails, scuppers, basket nails, lath hook, etc.

The Common Nail.

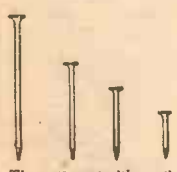
The most common kinds for all-round purposes are the oval and round wire nail. Both are roughened near the head in order to make them hold better, and of the two the round kind has a better grip. The oval ones have a small head, and when driven in are not so likely to split the wood. These wire nails, as the name implies, are cut from wire, and differ from wrought nails, which are dull and hammered to shape. The shank tapers on the thickness and the width and has not the sharp point of a wire nail. They are more useful in large work of a rough nature—for floor-boards, shed walls, etc.



Three common classes of screws. Cheese-head is used more in engineering; the counter-sink and round-headed for woodwork.

The Headless Nail.

Then there is the panel pin, which is a long but very thin wire nail with an equally small head. Indeed, it has hardly any head at all, and for that reason can be used in small work and driven right home. Another use is to hold the backing of picture frames in place, where it is hammered in flat along the surface of the backboard—the hammer sliding on the wood. The headless nail does not then scratch or prevent its being driven in easily. The tiny veneer pin and needle point are of similar use in small work. When a needle point has been driven as far as it is required, a slight tap on the side breaks off the projecting part and leaves the rest buried and almost invisible in the work. Clout nails are small with large, flat, round heads. Such shape makes them suitable for nailing down lino, roofing, felt and similar materials.

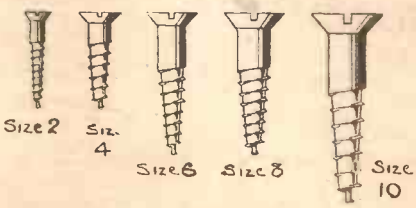


These tiny pin-like nails are also used in fretwork, and are obtainable in either brass or iron. They are driven in with a small fret hammer.

Screw Shanks and Sizes.

Screws are kept by most ironmongers in brass or iron of generally useful lengths. The thickness of the shank is given a number from No. 00 up to the very thick one of No. 20—and their sizes may be gauged from the five shown herewith, actual size. The three most common kinds are the countersunk, the roundhead, and the cheese-head. The countersunk, as the name implies, is driven home with the flat top flush with the surface of the work. Before driving home, therefore, a countersunk aperture must be made—with a rose-head countersink in a brace—in which the head can repose. Where a screw will be seen it is best to have a round-head screw, and in this case no counter-sink need be used.

These thin screws are principally used in fretwork where thin boards require a narrow shank so that the wood does not split.

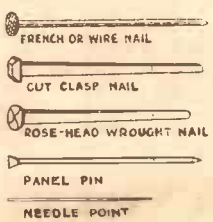


These are the actual sizes of screws in most common use. Mention of these sizes is helpful when buying.

The Method of Measuring.

A countersunk screw is measured from the top of the head to the point, but in the round-head screw, the measurement is made from the flat underside of the head. Remember in putting in a screw to make a hole for it first, and then drive it home with a screw-driver. Do not force it home by great pressure, but let the screw action eat its own way into the wood, simply being held and guided by the driver.

The nails and screws used in fretwork are, of course, a special kind. They have very thin shanks in order to drive into the thin wood without splitting it. They are, too, usually much shorter than the ordinary carpentry ones, and are obtainable from so small as ½in. long. A full range of these suitable for fine work is obtainable from Hobbies, Ltd., at a cost of 1d. or 2d. a dozen for screws, and sixpenny boxes of nails. Full particulars are given in Hobbies 1931 Catalogue, or are obtainable from Hobbies, Ltd., Dereham Norfolk.



Wanted—

Trained Brain Machines

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SIGNALLING MODEL RAILWAYS

by "Colour Light"

By Henry Greenly.

An indoor model railway with a bracket signal. [Photo: Wynne.

IN due course I shall have a good deal to say about the signalling of a model railway and hope to describe some of the numerous methods whereby safe railway travel is ensured. The application of these principles to the model are relatively easy.

The orthodox system of railway signalling provides two distinct types of semaphores. There is the "home" or absolute stop signal, which is a quite plain board with a red and a green light, for the "on" or "danger" and the "line clear" positions respectively. The "distant" signal which precedes the "home" has a fish-tailed arm and in modern examples is painted "yellow." As a rule there is no difference between them at night, although this anomaly is gradually being altered. Not only is the arm now painted "yellow," but yellow or orange lenses are sometimes used for the danger position, in place of the red, in both cases. A further improvement is to make the white stripe at the tip of the semaphore in the form of a chevron to correspond with the fishtailed end.

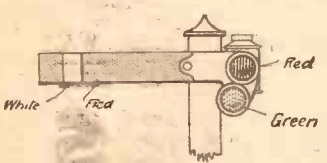


Fig. 1. Home signal.

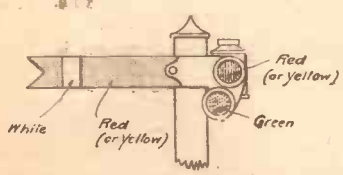


Fig. 2. Distant signal.

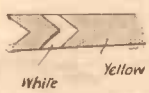


Fig. 3. Alternative form of distant signal arm.

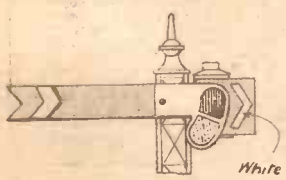


Fig. 4. A method of distinguishing distant signals

It may be mentioned that a distinguishing mark for a distant signal at night has been used by one of the Southern lines (the L.S.W.R. section), for many years. This arrangement provided an extra chevron light outside the lamp and was worked from the same lamp by reflectors.

For those who may be entirely new to railway signalling and its problems, it may be explained that a distant signal is placed 200 yards to 800 yards in front of a home signal. If it is found by the engine driver in the "danger" or "on" position, he must be prepared to stop at the home signal following it. Of course he may find this signal at "line clear" when he gets to it, so a distant is not a "repeater" of the home signal in the true sense of the word. But the interlocking gear should be such as will prevent a distant showing "line clear" when the "home" signal is at danger.

In model work this space is often reduced to a train length, and in some cases the model line may be so restricted that distant signals have to be eliminated. This is a pity as the yellow fishtailed semaphores add quite a touch of realism to any model.

A simple method of arranging the levers operating a "distant" and its "home" signal to properly interlock, is indicated in Figs. 5 and 6. The two levers must be placed next to each other in the signal cabin and a bracket soldered on to the "distant" signal lever so that

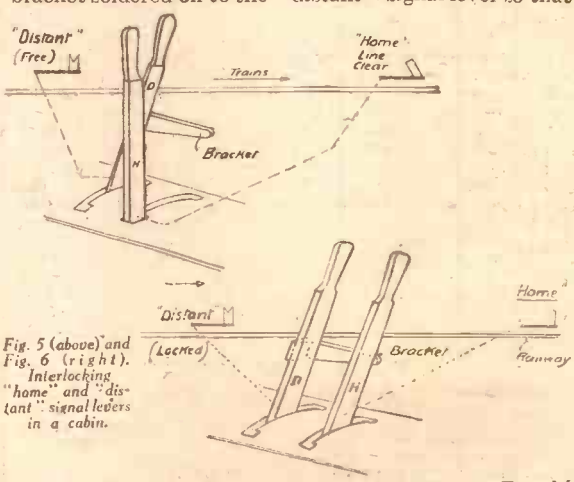
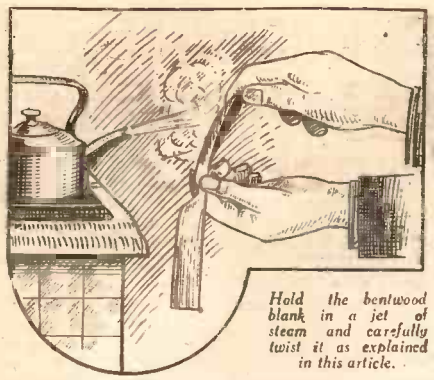


Fig. 5 (above) and Fig. 6 (right). Interlocking "home" and "distant" signal levers in a cabin.

it engages the back of the "home" lever. By this means there is no doubt about the "home" being at "line clear" when the distant signal is free to be pulled off. There is nothing wrong about having a "distant" at danger and its "home" signal at "line clear." The "distant" is only a warning, and a warning to the driver that he is required to be in a position to stop at the following home signal cannot cause an accident. This course is often adopted to check the speed of a train without actually stopping it. Further, when the "distant" lever is pulled it locks the "home" signal lever. The former must be put to danger before the "home" to prevent a wrong signal being given to the engine driver.

BENDING AND CARVING MODEL AIRSCREWS.



Hold the bentwood blank in a jet of steam and carefully twist it as explained in this article.

MANY model aeroplane enthusiasts who are skilled in making the wings and other parts of the model fail when it comes to making the propeller. It is really quite easy if you set about it in the right way and use the right materials. For instance, it is no use trying to make a bentwood propeller out of a piece of pine, because it will split quite easily.

Materials for Model Airscrews.

The most suitable material for bentwood airscrews is birch, and the blank should be cut out so that the greatest width of blade is about $\frac{1}{10}$th of the diameter. The greatest thickness should be $\frac{1}{16}$in. The centre of the blank should be cut out as shown in Fig. 1, and the cut-out edge is the edge to bend.

Bending the Blades.

Hold each blade in a jet of steam as shown above for a moment or two, and then gently twist one blade at a time, increasing the pressure until it yields. Do not try to bend it before the steam has penetrated the grain; you will "feel" the right moment at which to use pressure. Another important point is to bend each blade to exactly the same degree, and as in cooling down each blade will tend to go back a little, a little over-bending is necessary to allow for this.

To attach the shaft to a bentwood screw, wrap a piece of tinfoil cut from a cigarette tin round the centre, and neatly solder the shaft to this. Next revolve the airscrew by holding the shaft between the finger and thumb and spinning it. If the airscrew is correctly balanced, it should tend to stop in a horizontal position; if it does not do so, glasspaper the heaviest blade until it does. The balance of an airscrew is important, for at high speeds an unbalanced airscrew will vibrate.

Bentwood screws are quite satisfactory, but not so efficient as those which are carved. To carve a screw, first cut a piece of mahogany to the shape shown in Fig. 1, and then pare away each side of the blade as shown in Figs. 2, 3 and 4, remembering that one side of the blade must be hollow or concave and the other round or convex.

Correct Proportions.

The method of attachment of shafts of both bentwood and carved airscrews is shown in Fig. 6. Eighteen-gauge piano wire is the best material to use. Don't make the mistake of thinking that any sort of airscrew will do. To successfully fly a given model it must be made to certain definite proportions. Its diameter, for example, should be not less than $\frac{1}{3}$rd of the span of the mainplane. The width of the blade, as already stated, should be about $\frac{1}{10}$th of the diameter of the airscrew, and the pitch should be not less than $1\frac{1}{2}$ times the diameter. The pitch is the distance that the airscrew will take a model forward in one revolution, and if you make the block about $\frac{1}{15}$th of the diameter in thickness you will obtain approximately the right pitch.

Fig. 1. The carved blank.

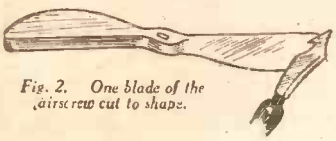


Fig. 2. One blade of the airscrew cut to shape.

Fig. 5. The finished bentwood airscrew.

Fig. 3. One blade finished.

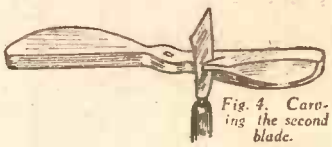


Fig. 4. Carving the second blade.

To finish model airscrews, first coat them with a thin coat of goldsize, and then a coat of varnish, or else give them a coat of cold lacquer which is quite transparent.

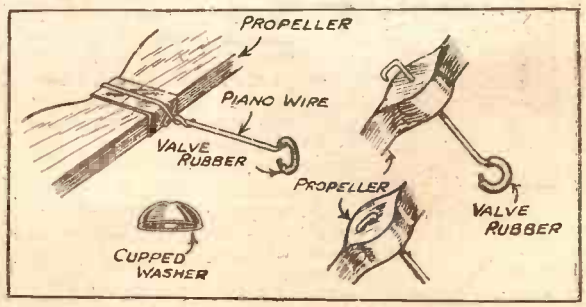


Fig. 6. Method of securing the shafts to bentwood and carved airscrews.

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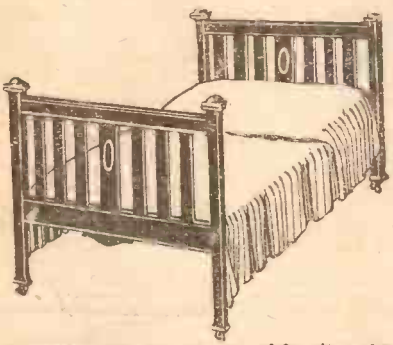

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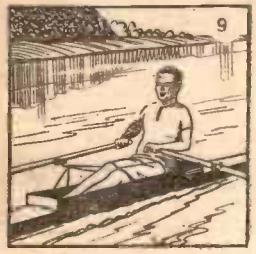

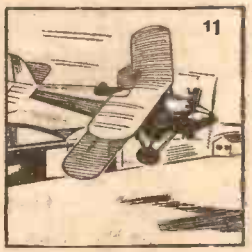

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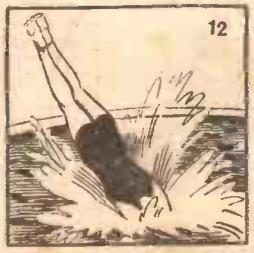

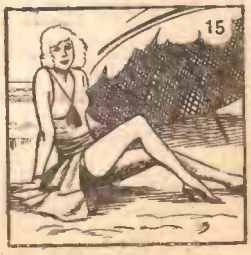

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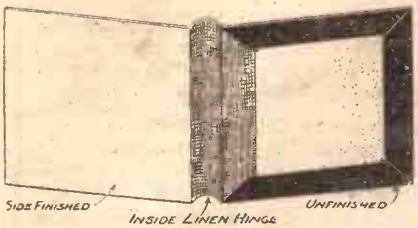

Fig. 1 (Left).
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Tools required are scissors, a sharp knife, two boards and weights for pressing. Materials can be purchased cheaply or discovered by a little rummaging round; they include a few feet of fairly wide tape, a tube of seccotine, a bottle of paste, a good supply of stiff cardboard, some sheets of clean white paper, and a few strips of good strong linen.

Binding Books.

First of all let us tackle the old books, the covers of which are in poor repair or perhaps non-existent. Remove any old covers, also the first pages if they are dirty, the fly leaf and the title page. These can be replaced by a new home-made title page and two sheets of clean white paper. Cut a strip of linen the length of the book and two or three inches wider than the thickness. Turn down the top and bottom of the linen and sew it in place so that the ends will not fray when the volume is in use. Next place the linen strip against the back of the pages and sew strongly, picking up the stitches which hold the pages together, working across the back, then down to the next line, and across again until the bottom is reached. In some cases it is impossible to pick up the stitches in this fashion; when these kind of books are already bound the only thing to do is to seccotine the linen to the back of the pages. This method is not so successful as the first, and should not be resorted to if avoidable. Before commencing to gum or stitch the linen to the pages, the linen strip should be so placed that an equal amount overlaps on each side. Now cut out two sheets of stiff cardboard a quarter of an inch larger than the size of the pages, except at the back, where it should be nearly flush. Then seccotine the linen strip to each sheet of board, allowing just a shade of linen free between the edge of the cover and the back of the pages, so that the back will open easily. Cut out a similar strip of linen to the first, and sew the top and bottom in the same way to prevent fraying. Seccotine this strip to the outside of the cardboard covers, but not to the linen supporting the pages. Allow a little freedom for the book to open.

Fig. 3.—How to bind music.

Having decided on the colour, the paper cover will be cut out, allowing an overlap of one to one and a half inches on either side, except, of course, on the edge which will be nearest the linen strip. This edge will finish flush with the back, only covering the linen as far as the edge of the cardboard. Paste this paper on the outside of the cover, so that no wrinkles are formed. This part of the work is best done by smoothing the paper on to the board with a fine cloth, always working in one direction. Turn the paper round the edges of the cover and cut as in Fig. 1, taking care that one part overlaps the other on the corners. Paste these sides down on the inside of the cover, avoiding wrinkles as before. If thought desirable, the corners of the cardboard can be still further protected by triangular caps of different coloured paper as is often seen in bought volumes. The last stage in the binding is now reached. Cut out two sheets of white paper so that they are just a little smaller than the cardboard. Paste them carefully on the inside so that they come close up to the edge of the cover and so hide the edges of the paper covering.

The book has now to be titled. This can be done by printing on a small square of paper for the hinge and a larger sheet of paper for the front. If preferred, a picture which has some bearing on the subject of the book or some artistic value, can be pasted on the front and the title printed along the top or bottom (Fig. 2). If this titling is going to take a long time the book should be placed between two wooden boards and weighted down so that the volume sets in proper shape before titling. Assuming that it will take only a short time, then it can be done before the book is put in the press.

Binding Periodicals.

First of all remove all advertisements and other pages that are not required, place the periodicals in their proper order, and make out a contents page. This page will be secured in the front of the book and can be hand-printed or typewritten. Sew all the copies together, close to the back, allowing enough play in the stitches for the pages to open easily, but not enough to allow them to sag. Next cut out a strip of linen as before and sew the pages to it. The succeeding stages are the same as for rebinding old volumes.

In binding periodicals you have to use your own judgment as to thickness, and the golden rule is not to make them too thick, but to keep them of uniform thickness and as far as possible an equal number of weeks or months in each. Of course this cannot be followed if the thickness of each copy varies, as in Summer and Xmas numbers; in these cases it is impossible to keep uniform bindings. Do not forget to put on the volume numbers.

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Locomotive Stamps

By P. L. PEMBERTON

CONSIDERING the close relationship between the railway and the mails, it is surprising that more use has not been made of the locomotive in postage-stamp designs. This reflection is conjured up by the sight of the new set of stamps issued in Spain last May in connection with the International Railway Congress held in Madrid. It is true that these particular stamps are not an advertisement for the steam engine as an artistic subject—but that is the fault of the artist. On some of the other stamps illustrated on this page the locomotive fits naturally and gracefully into the design. A complete collection of all stamp-designs in which an engine or a complete train forms the outstanding feature is well within the reach of the shortest purse. There are many other designs in which the locomotive features as a detail and in almost microscopic form, but those which I am about to describe, numbering fewer than twenty in all, are the only ones worth considering. Of some of the designs there are sets of many values, but for the purpose of making a study of the locomotive on stamps a nice unused specimen of one denomination in each would suffice.

Ecuador.

New Brunswick.

A Newfoundland express.

The very first stamp of this description was issued in 1860, when the British colony of New Brunswick (then a separate entity, but, since 1867, incorporated in the Dominion of Canada), brought out a new issue, of which the 1 cent and 12 cents respectively showed a locomotive and a steamer. The former, with its towering funnel and miscellaneous collection of gadgets, is reminiscent of its forbear Stephenson's Rocket.

United States 3 Cents.

The next representation of an engine is provided by the 3 cents of the 1869 issue of the United States. This is one of the set which is memorable as being the first pictorial series of stamps ever issued. The locomotive here shown is but a slight improvement on the one described above. The railings have disappeared from around the boiler and a cow-catcher has been added. The latter is an adjunct of the first importance in a country where the lines are laid through vast tracts of cattle country.

United States, 1869.

The most valuable stamp in the railway collection, and certainly the most odd-looking, is the Peruvian 5c. of 1871, which was issued for use on letters passing between the capital, Lima, and the provincial towns of Callao and Chorrillos. It can generally be procured for something less than £1 unused, or about half the price for a fine used specimen. The stamp was issued in long horizontal strips, instead of in sheets, and is unperforated. The design and inscriptions are embossed in white on a solid ground of red. The Arms of the country occupy the lower part of the central space, and above is a steam-engine and tender, both apparently being provided with six wheels.

Peru, 1871.

Before the end of the century other examples came from Nicaragua (1890), Salvador (the 3 cents. of the second issue of 1896) and Honduras (1897). These still show engines of a more or less primitive kind, the huge bell-topped funnel being a marked feature.

Honduras.

The United States came to the fore again in 1901 with a stamp bearing a picture of a train with the caption "Fast Express." Here we see for the first time an engine modelled more or less upon lines with which we are all familiar. This stamp is one of the set of six values issued in conjunction with the Pan-American Exhibition which was held at Buffalo. The subject of each design was intended to represent the march of progress; perhaps the most interesting is the 4 cents., which depicts one of the earliest types of automobile—a very quaint-looking contraption to our modern eyes.

Ecuador.

The year 1908 saw the appearance of the special set of stamps issued in Ecuador to mark the twenty-fifth anniversary of the opening of the first railway in that tropical land. The set consists mainly of triangular

An American express, 1901.

Spanish express entering tunnel.

stamps bearing portraits of presidents, engineers, and others, but the lowest value is rectangular and shows one of the engines in use on the line at the time of the celebration.

Other Issues.

Four years later, Nicaragua and the United States once more stepped into the breach, but while the former country gives us, on the Zelaya issue of 1912, an engine of an ancient type, the United States, on the 5 cents. of the parcels post set, presents an excellent view of a modern locomotive approaching the mail-catching apparatus which is seen by the side of the line. It is a remarkable fact that, until 1918, there is no instance of a stamp from the Eastern hemisphere in which the locomotive is the main feature of the design. But in that year the scene shifts to the Portuguese colony of Mozambique, where, for the territory administered by the company of that name, a 15-centavos stamp with a view of a train emerging from a sylvan glade was issued as one of a long set of pictorial stamps.

Brazil.

The next design in the list is that used for the two lowest values of the 1920 issue of Brazil—very insignificant and poorly printed. Guatemala, in 1921, issued a stamp of 15 pesos showing a train passing over a bridge. The Soviet Government issued, in 1922, a stamp which portrays a goods train emerging from a tunnel. Turkey for its postage-due stamps of 1926 used a design showing a train crossing the Kizil-Irmak bridge, and Newfoundland, on the 5-cents. value of the beautifully-engraved set of 1928, shows a train described as "Express crossing Newfoundland."

NEXT WEEK:

HOW THE PETROL PUMP WORKS

We now come to the Railway Congress of Spain already referred to. The function, whose only visible result is apparently this poorly-printed set of stamps, lasted from the 5th to the 15th of May. It was attended by delegates from all the principal European countries, to discuss problems affecting the smooth working of the huge network of railways, sectionally under different managements, which covers the continent of Europe. The stamps were never on sale at the ordinary post-offices, but only at the special post-office installed in the building where the conference was held, and, for three days only (13th, 14th and 15th May), at the post-offices in the International Exhibition at Barcelona and at the Ibero-American Exhibition at Seville. The set consists of ten values, from 1 centimo to 50 centimos, with the three higher denominations—1, 4 and 10 pesetas.

Spanish Railway Congress stamp.

TELEVISION (*continued from page* 81.)

Fig. 3 shows the arrangement of the complete instrument.

Now to use the Televisor, disconnect the Loud Speaker from your receiver, and connect the two terminals of the Televisor to the Loud Speaker terminals of your set. Switch the set on and look at the lamp through the holes in the disc. Switch on the motor, and as the disc gets up speed the holes will form a series of lines which gradually form into a broad band of light, and if the set is tuned to a station which is transmitting music or speech, a series of wonderful patterns will be seen on the "Screen" (which is the name given to the lighted area seen through the lens). When television is being received a series of narrow lines will be seen to pass either downward or upward across the lighted area. The speed should be adjusted until the lines are horizontal. If the lines run downward, it is an indication that the disc must be speeded up, while if the lines run upward the disc must be slowed down. To regulate this speed you can arrange a resistance in series with the motor, or press the tips of the fingers of one hand against the disc itself. This is quite a good way, and is, in fact, preferred by the writer, as it enables quick changes to be made to compensate for surges in the motor due to fluctuations in the Mains. When the image of a person is received, it is quite possible that it will not at first be in the centre of the screen. It may be split into two sections either vertically or horizontally. In this case, allow the disc to gather speed for a moment or two until the correct image occupies the centre of the Screen and then hold it there. This is known as "phasing," and is a necessary procedure even on the commercial instruments. If, of course, during a television transmission nothing can be seen on your screen but rows of dots it is an indication that the speed is nowhere near correct, and it must be speeded up or slowed down until the narrow lines are seen passing downward or upward.

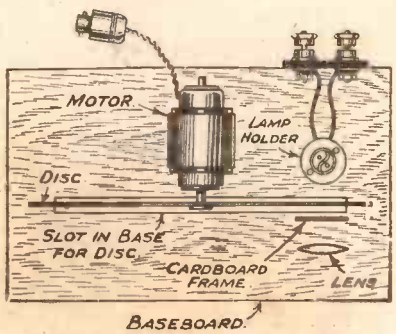
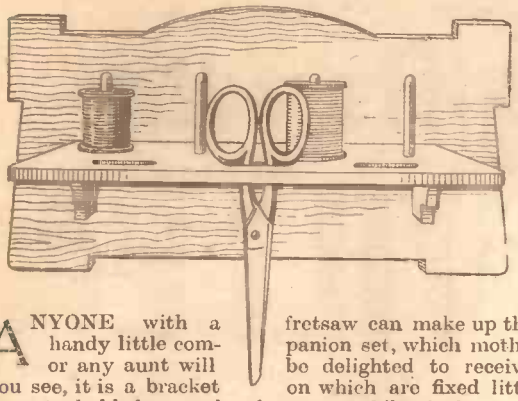


Fig. 3.—Diagram showing the complete Televisor apparatus.

Many refinements will no doubt suggest themselves to the thoughtful reader, but the apparatus as described has been put to practical use and has given good results, although it should be understood that the commercial Televisor gives a much brighter and larger picture, and is equipped with a "synchroniser" which enables the picture to be held quite steady during the transmission.

A NOVEL SEWING TIDY



ANYONE with a fretsaw can make up this handy little companion set, which mother or any aunt will be delighted to receive. You see, it is a bracket on which are fixed little posts to hold four reels of cotton, whilst in front are holes to hold three pairs of scissors. The whole thing is quite simple and is completed from any common fretwood ¼in. thick. Choose mahogany or oak, as these are both easy to cut—and only cost a few pence to purchase. In addition to the wood we need 6ins. of dowelling $\frac{3}{16}$ in. in diameter, but if one gets a thin wooden skewer it will serve the same purpose. Beyond the back and the shelf there are two small support brackets for the shelf itself, which can be cut from similar wood or thinner material if desired.

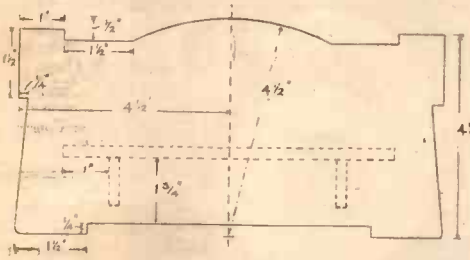


Fig. 1.—The lay-out of the back, with all the necessary measurements for the outline and the position of the shelf.

The drawing at Fig. 1 gives the shape and the dimensions of the back. Mark these measurements off into a board 9ins. long and 4½ins. wide. In addition to the actual dimensions, it is wise to mark the position of the shelf and its two brackets beneath. The dotted lines on the diagram show these clearly and they should be lightly marked off with a pencil. Then make two or three holes so we may know where to drive the nails or screws in from the back.

Next we cut out the shelf according to the dimensions marked at Fig. 2. This board is 7ins. long and 2½ins. wide. Notice that the three holes for the scissors are cut at distances of 1in. from each other and ⅜in. from the front edge. The position of the reel posts are also shown and marked off, and here again we should drill a hole through

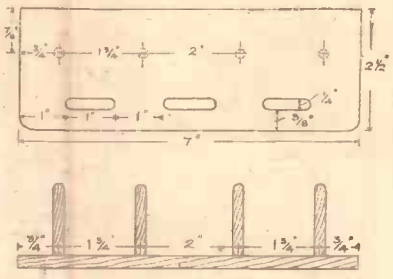


Fig. 2.—This shows the marking off on the bracket, and (below) a front view with the four dowel rods in place.

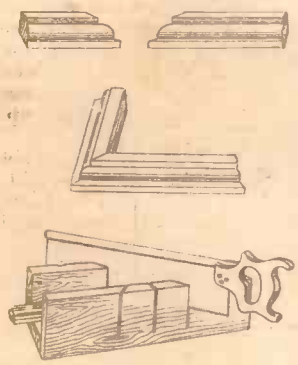
the centre for the nail to be driven through from the underside. Now cut off four lengths of the dowelling or the skewer each 1½ins. long. Sandpaper quite smooth and then glue in position on the shelf, driving a thin nail from the underside to further strengthen the post.

Now we can get out the two simple brackets and must be sure that the right angle will fit between the shelf and the back. The shelf is glued into place on the back and strengthened with screws or nails through the holes already made. Then glue the shelf supports beneath in the position previously marked, and the whole thing is complete.

Fig. 3.—The shape of the support bracket marked out in ¼in. squares.

A MITRE TROUGH——

For Forming Corners in Moulding.



WOODWORK and fretwork are often decorated with small ornamental moulding which requires fitting in at the corners. The ends of the moulding must be cut to an angle of 45 degrees—known as mitreing. For this the "trough" shown herewith is a useful and necessary tool. By placing the saw through the two slots across the sides, the correct angle is obtained. The moulding is laid inside and the sawcut made in the ordinary way. Hold the trough and the moulding firmly, and be sure to measure off the right length from the back. Such a trough, of course, is also useful for cutting the larger moulding used in picture framing, and indeed for any form of cutting where an angle of 45 degrees is required. The two lots of sawcuts provide for two opposite ends and the centre cut for a straight sawing.

This is a trough supplied by Hobbies Ltd., and useful to any woodworker.

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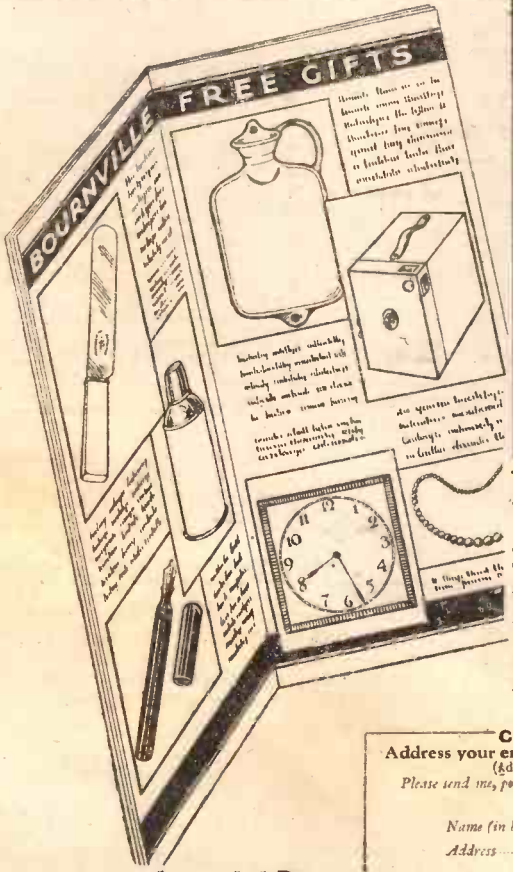

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Thank You!

JUST as I am putting the finishing touches to this issue the post-boy has arrived with loads of letters from readers of No. 1 of the new HOBBIES. I have had time to read only a few of them, and I wish to take this early opportunity of thanking those many readers who have taken the trouble to write. Most of those I have read speak in terms of praise of our new style; others contain helpful criticisms, all of which are being carefully noted. As soon as I have satisfied the appetites of the greedy printing presses which turn out the enormous edition of HOBBIES at the rate of many thousands an hour, I am going to read through those letters carefully, and although it may not be possible for me to reply to each one individually, I want you to keep my enthusiasm burning by writing to me as often as you like.

Running a Home Cinema.

NOW that the dark evenings are with us your attention will naturally turn to indoor hobbies. A fascinating hobby is home cinematography, for you can run a home cinema very well indeed without making the films yourself. The projector may be purchased for under £3, and any white sheet does for a screen. My photography expert explains in next week's issue how to run a home cinematograph. He tells you how you may hire films, and discusses the various home projectors on the market. It is not generally known that you can hire any number of professionally-made films suitable for home projectors, and these films cover a wide range of subjects such as the drama, natural history, comedy, sport, travel, and so on. Hired films are about 400ft. in length and take about sixteen minutes to project, and the hire price is only 2s. 9d. a reel. See next week's issue and read all about it!

Any Problems to Solve?

THE replies published on this page represent a selection of this week's most interesting queries. *Every* query is replied to through the post. If you have a problem which seems a hard nut to crack, my band of "know-alls" will solve it for you. Send me a letter explaining your difficulty and leave the rest to me. You won't be kept long waiting for a reply! And that reminds me. If any of you have encountered a difficulty in assembling our free-gift model seaplane, or if it fails to perform as the designer intended it should, his advice is at your service.

NEXT WEEK!

How to Run a Home Cinema.

Free Design Chart for Making a Fine Mantel Clock.

Accumulator Acid.

The electrolyte or exciting liquid used in wireless accumulators, S. T. (Hull), consists of sulphuric acid and distilled water. It is necessary for this solution to have a specific gravity of 1.22, and if you mix one part of pure acid to 3½ parts of water (by volume), taking care to *add the acid to the water*, and *not* the water to the acid, the specific gravity will be correct.

Ebony Stain.

"I wish to stain some whitewood a deep ebony colour," writes G. N. (Leeds). Use ordinary black waterproof drawing ink diluted with water. A cheaper solution which gives a deep black finish is made by placing some iron filings in vinegar, leaving the solution to stand for a few days. This should be applied with a soft rag.

Lighting a Lamp with Ice!

B. D. (Eton College) says he saw a lamp lit with a piece of ice, and asks how it is done. A piece of metallic potassium is laid on the wick and touched with a piece of ice, when the wick immediately bursts into flame. Only the smallest piece of the metal should be used.

Painting a Blackboard.

H. T. (Stockport) wishes to know how to finish a blackboard. The surface of a blackboard must contain no gloss, otherwise it will be difficult to make chalk-marks on it. First give the board a coat of drop-black mixed with gold-size and containing a quarter of a pound of fine emery powder. When dry, rub this down and apply a second coat. Chalk will mark quite easily on this surface.

A Paint for Fabrics.

D. J. (Coventry) inquires whether it is possible to paint calico with designs for scenery intended for amateur theatricals, with a colour which will not run. The paint used for this purpose should be mixed with oil-varnish and gold-size in equal proportions, thinned down with turpentine. This paint will dry *on* the fabric in about six hours.

Making Blue Photographic Prints.

It is quite possible, T. S. A. (Durham), to tone to a blue colour, prints made on self-toning paper or P.O.P. A solution for the purpose is sold quite cheaply by most photographers, but as its constituents include lead nitrate, chloride of gold and ammonium thiocyanate, it would hardly pay you to make a small quantity.

Hardening Steel.

W. N. (Dachet) has made some wood-working tools from mild steel and wishes to harden them. Mild steel cannot be hardened by heating and quenching, but it may be case-hardened (that is to say, its *surface* may be hardened) by heating it and dipping it in leather dust, made by rubbing a piece of old leather on sandpaper. Several applications will be necessary. Special compounds, costing a few pence a tin, are sold for the purpose.

Curing Warped Wood.

Warped wood may be brought back to truth, N. W. (Newcastle), by placing it between two stouter boards and clamping them together. They should be left so clamped for several days before removing the clamps.

Bending Strips of Wood.

Small strips of wood may be bent in the following manner, H. W. D. (Gloucester). Attach a piece of iron piping, large enough to accommodate the strips of wood, by means of a rubber tube to the spout of a kettle of water. Allow the water to boil, and the steam will penetrate the grain of the wood and make it absolutely pliant. The steaming should be continued for a quarter of an hour before attempting to bend the wood.

Curing a Sulphated Accumulator.

B. J. E. (Roehampton) has a wireless accumulator the plates of which are badly sulphated. There are two remedies for this; the first method is to open the accumulator by inserting a knife between the joint of the top of the accumulator and the sides, and to lift the plates out. The plates should then be scraped, the inside of the accumulator cleaned out, and the top refixed by means of a solution made by dissolving pieces of celluloid in amyl acetate. The second method is to take the accumulator to the charging depot and have it put on slow charge and discharge. It rarely pays, however, to attempt to remedy a badly sulphated accumulator.

Stamping Initials on Leather.

Special tools for embossing monograms and initials are obtainable from most tool dealers. These tools are heated, a piece of gold or silver-leaf is placed over the leather and the tool pressed in. After removing the tool the superfluous leaf is brushed away. The leather should be treated before application with a substance known as glaire, costing a few pence a bottle.

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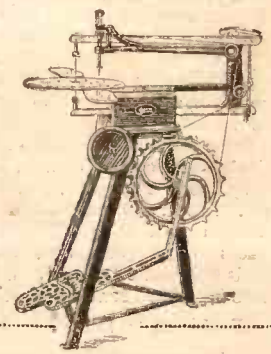

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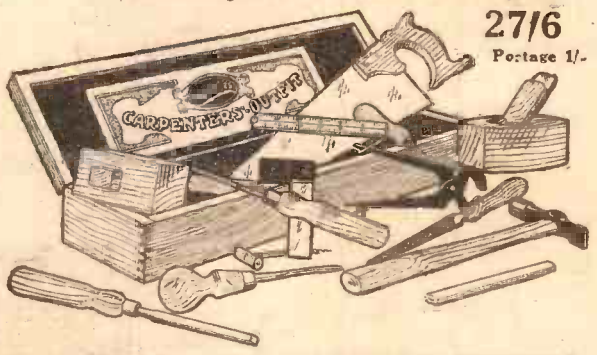

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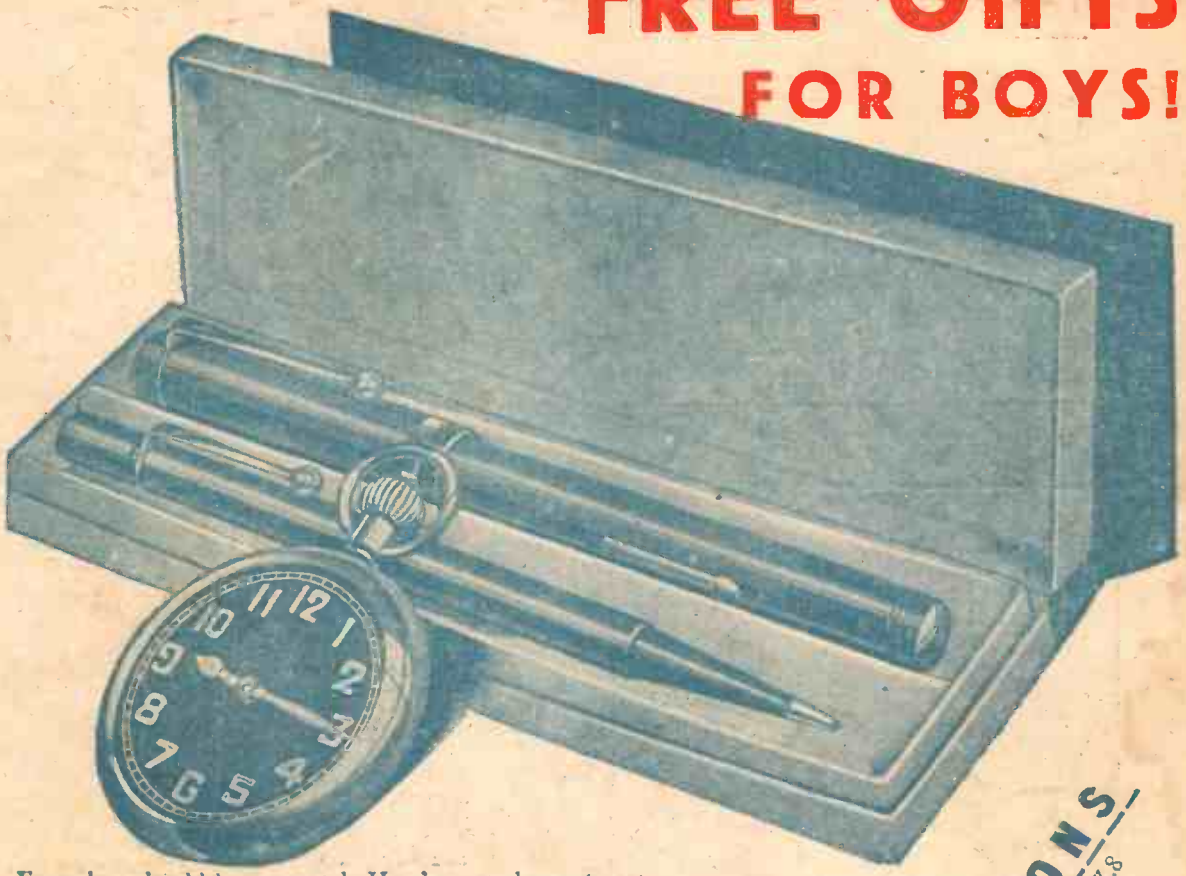

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