Stephenson

SPECIAL MODEL-MAKING NUMBER!

SPECIAL TRIX SUPPLEMENT IN EVERY ISSUE.

HOME CRAFTS
WOOD WORKING
MODEL MAKING
AMATEUR MECHANICS
ETC. ETC

Hobbies AND WIRELESS SUPPLEMENT

2D

Nov. 5th, 1932.
No. 1933.
Published weekly Wednesday.
Registered at the G.P.O. for Transmission by Canada Post Office

FREE INSIDE!
DESIGN SHEET FOR THE "LION" PICTURE FRAME

MAKE THIS WORKING MODEL HARBOUR

Published by GEO. NEWNES, LTD., 8-11, Southampton Street, Strand, London, W.C.2.

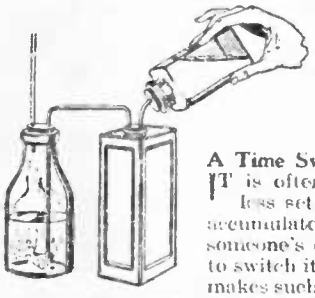
LET US SOLVE YOUR HOBBY PROBLEMS

Vol. 75. No. 1,933 Published Every Wednesday NOVEMBER 5th, 1932

THIS WEEK'S CLEVER IDEAS

Making Model Airships at Home.

IT is much more fascinating to inflate a model balloon or model airship with hydrogen instead of air or coal gas. The apparatus required is illustrated in the sketch here. It costs 5s. complete with instructions, half-gallon generator, tubes, corks, two airship envelopes, six balloons, 1lb. of composition, and diagrams. Hydrogen, of course, lifts about 72lb. per cubic foot, whereas coal gas, as obtainable from the gas jet at home, only lifts about 50lb. per cubic foot.



Apparatus for generating hydrogen for model airship

A Time Switch for Radio.

IT is often found when the wireless set is switched on that the accumulator is run down, due to someone's carelessness in forgetting to switch it off. A new time switch makes such carelessness impossible, for it automatically switches the set on and off at predetermined times. All you have to do is to set your alarm clock, when the device does the rest. There is nothing in it to go wrong, and for operating the low-tension circuit it costs 3s. 6d., and for H.T. (all mains) 5s. 6d., both prices being post free. We have tried one of these devices and found it to be quite satisfactory.

Something for Nothing.

A WELL-KNOWN petrol company has recently published (and will send free to readers of this paper) an excellently produced pamphlet, entitled "The Modern Aeroplane." This is certainly one of the best booklets we have yet seen, for it shows the component parts of the modern light aeroplane and lift-up flaps reveal every part of the mechanism. Readers may have the address of the firm concerned upon application to the Editor.

A Model Donkey Engine.

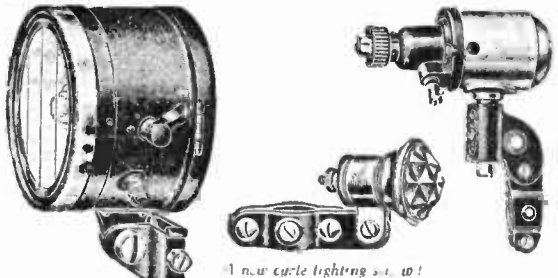
A REALLY well-made model donkey engine fitted with double-acting slide valve cylinder and slip eccentric reversing gear, has just been marketed at one guinea. It has a boiler, 2¾in. diameter of polished copper. It is 10½in. high, the cylinder is fitted with lubricator, and the boiler has a safety-valve, starting tap and whistle. The engine is fitted with reduction gear, which gives exceptional power at low speed. The base is of enamelled cast iron 4½in. by 5½in. A larger model costs 30s.

Radiogram Conversion Unit.

A NEAT, self-contained pick-up and turntable for mains operation and which can be attached to any radio set has just been produced. It requires no cabinet or mounting fixtures and in a few seconds it will convert any receiver to a radio-gramophone or it will modernise any clockwork gramophone. The unit runs silently and uniformly at any desired speed between 70-90 revolutions per minute. It will run for over sixty hours on one unit of electricity, so that the average cost of running is about 1d. for sixty hours. It is suitable for A.C. operation only, operating on 40 to 60 cycles. The A.C. models are sent out for operation on 200 to 250 volts, and a change-over to 100-130 volts is effected by simply altering the position of the switch plate. The universal models are similarly adjustable for 100-130 and 200-250 volts for both alternating and direct current mains.

A New Dynamo Cycle Lighting Set.

THIS new dynamo lighting set has a strong headlamp with a special silvered reflector and glass, giving a powerful beam of light. The front of the lamp is chromium plated, and the fixing bracket is adjustable and holds the lamp at any desired angle. Provision is made inside for a flashlamp, which can be switched on when the cycle is stationary. The rear lamp has a red faceted glass, and is fitted with a low-consumption bulb. The dynamo itself is chromium plated and has an automatic voltage regulator which prevents the bulb from burning out. Complete it costs 19s. 6d., or without rear lamp 17s. 6d.



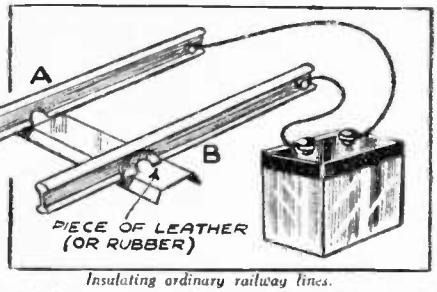
A new cycle lighting set with automatic voltage regulator

The address of the manufacturers of items mentioned on this page can be obtained on application to the Editor.

NOTES AND NOTIONS from our READERS

Insulating Ordinary Railway Lines.

THE ordinary tracks which are used for clockwork trains can easily be insulated, so that they can be used in an electric system. The metal tab (A) of the sleeper is raised so that the rail can be taken out. A piece of leather, which is a good insulator, is then inserted between the sleeper and the rail, thus making contact between the two impossible.



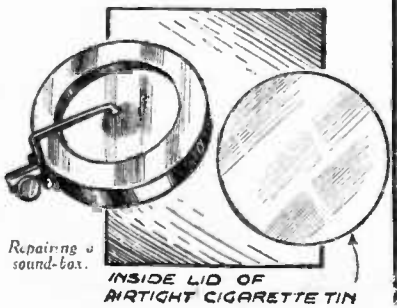
Insulating ordinary railway lines.

This must be carried out on all the sleepers, but only one side (*e.g.*, B) of the track need be insulated where a sleeper occurs. A current from any 4-volt accumulator is then led into the rails (as shown in diagram), and two brushes or metal strips on the locomotive carry the current from the rails to the two terminals of the electric motor in the locomotive.

By this method one has not the expense of buying the electric rails, and the train can also be controlled outside the track. With a rheostat (or variable resistance) to control speed and a switch for "stop-go" purposes the control of the train becomes very realistic.—E. Russell (39, St. Nicholas Lane, Lewes).

A Simple and Inexpensive Method of Repairing a Damaged Sound-box.

WHEN the diaphragm of a gramophone sound-box becomes loose or broken, the method below will save the cost of a new sound-box.



Repairing a sound-box.

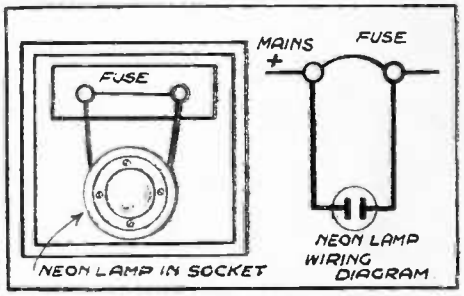
THAT DODGE OF *YOURS?*

Why not pass it on to us? We pay Five Shillings for every item published on this page. Mark your envelope "Notes and Notions," and address to The Editor, "Hobbies," Geo. Newnes, Ltd., 8-11, Southampton Street, Strand, W.C.2. Put your name and address on every item. *Every notion sent in MUST be original*

or the expensive fees of a dealer in musical instruments. Carefully remove the screws which hold the case of the sound-box, and remove the old diaphragm by unscrewing a little nut fixed on the shaft connected with the needle holder. Then procure a Player's tin (tobacco tin) and carefully (with a special cutter provided in the lid) cut the thin metal disc, which is used to keep the tobacco air-tight, away from the tin. Care must be taken when cutting this out, as the slightest bend would spoil the tone. Next, with sharp scissors, cut this to the exact size of the old diaphragm. With the point of the scissors punch a small hole in the centre, and fit on to the shaft, and put the little nut on tight. Before putting the case on again, let a little candle wax drip over the nut. This makes the joint vibrationless. Then fix the case on and the repair is finished.

Self-indicating Fuse.

A RATHER novel self-indicating fuse can be rigged up by shunting a neon lamp across a fuse board. A standard 220-260 volt neon lamp can be purchased through any electrical dealer for about 3s. Fix a bulb socket beside the fuse and connect the terminals of the latter to the socket as illustrated, and insert the neon lamp. As it contains no filaments inside it offers no resistance and consumes no current so long as the fuse remains intact. But on the fuse burning out the current will pass between the electrodes inside the lamp and impart a soft red glow.—J. K. M. Holmes (Vizcaya, Wolveleigh Terr., Gosforth, Northumberland.)



A self-indicating fuse.

A Tip for Fastening Nails.

NAILS can be used in the following manner to fasten down a box which you wish to keep as little damaged as possible. Under each nail put a small slip of wood, so that when the box is to be opened the piece of wood can be split away, and enough of the nail head is exposed for it to be pulled out easily without injuring the surface.

A Corkscrew Hint.

IN drawing a cork it often happens that the corkscrew pulls right out, and it is then difficult to prevent the cork breaking up when a second attempt is made to pull it. Bind some thin twine tightly round the turns of the screw, and reinsert the screw, driving it down in the usual manner. The twine will give the corkscrew a firm grip.

Making Wood Stick to Metal.

THERE is sometimes a difficulty in getting wood to adhere to metal by means of glue. The trouble may be overcome by cleaning the metal thoroughly with soap and water, and then letting it dry. Now rub the surface thoroughly with the cut part of a raw onion. Before the juice has time to dry apply a piece of wood with the glue on it, and a secure join will be obtained.

This Week's Mental Nut. No. 41.

THREE books will be awarded each week for the first correct solutions opened. Mark your envelope "Mental Nut" No. 41.

A CLOCK hangs on the wall of a railway station, 71ft. 9in. long and 12ft. 5in. high. Those are the dimensions of the wall, not the clock! While waiting for a train I noticed that the hands of the clock were pointing in opposite directions, and were parallel to one of the diagonals of the wall. What was the exact time?

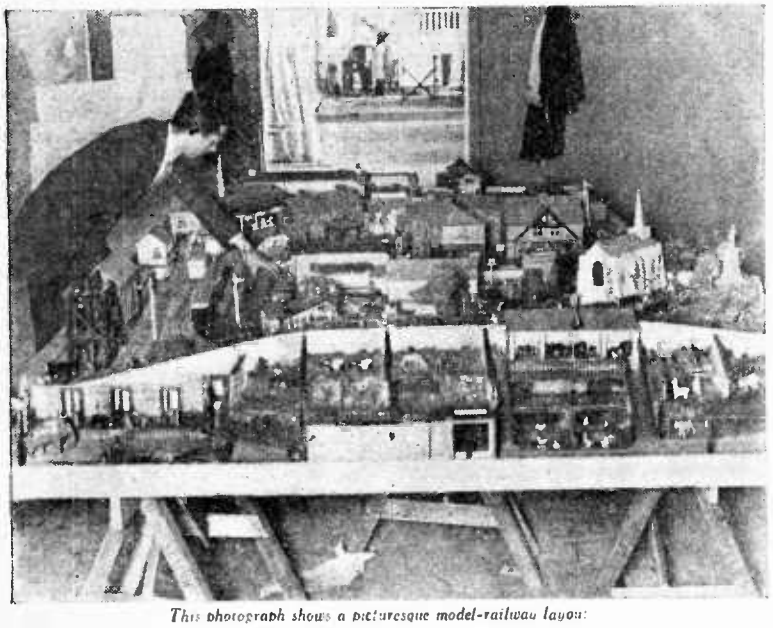
Answer to Last Week's Problem.

HE then proved the relationship by the following remark: "You are my father's brother-in-law because my father married your sister, you are my brother's father-in-law because my brother married your daughter, and you are my father-in-law's brother because my wife was your brother's daughter."

BEAUTIFYING A MODEL RAILWAY

By "Signal"

Some useful accessories for a model railway layout.



This photograph shows a picturesque model-railway layout.

NOW that the evenings are getting shorter, many of our readers are, no doubt, turning to their model railways. Such additions as telegraph poles, fencing, lamp-posts and stiles all help to make the layout more realistic.

Perhaps the telegraph pole is the most common sight along the track, and can well be used to advantage, as may be seen forthwith. Its construction is simple and cheap, in that the only necessary requirements are: dowelling (¼in. diam.), matches, a few ⅜in. fret nails, a small piece of tin, and 2 small pieces of ply-wood.

Take a piece of dowelling 8in. long, and sharpen one end as in Fig. 1. Next, obtain 6 matches 1¾in. in length. Chip six small grooves in the dowelling, to accommodate the matches, commencing ½in. from the top, and at intervals of ½in. measuring from the centre of the grooves. Insert into the dowelling eight fret nails, as in Fig. 1, at intervals of 1in., four on each side of the pole. These are the footholds. Cut a piece of ply-wood ¾in. x ¾in. x ¼in., and in it drill a hole ¼in. diam. to take the dowelling. Glue the dowelling in and glue the whole to a bigger base 1¾in. x 1¾in. x 3/16in. The "pots" should next be made. These consist of small pieces of match, about ⅝in. long, cut with a razor blade and glued to the 1¾in. matches. It will be found that an "arm" can accommodate four comfortably, but any desired number may be put on. Glue the arms to the dowelling in the grooves, and, lastly, affix the piece of tin, which measures

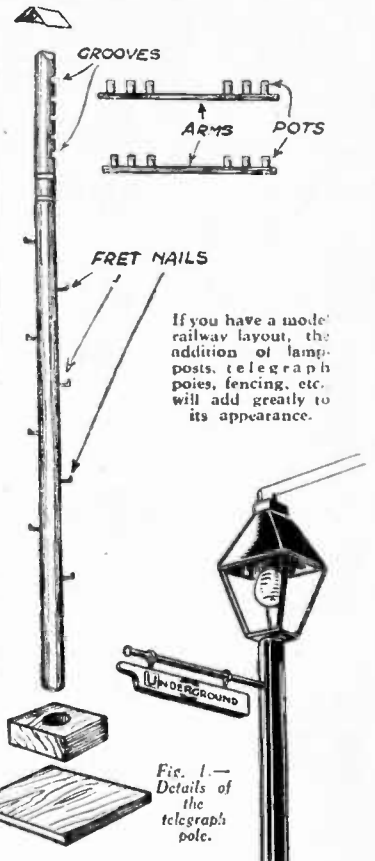
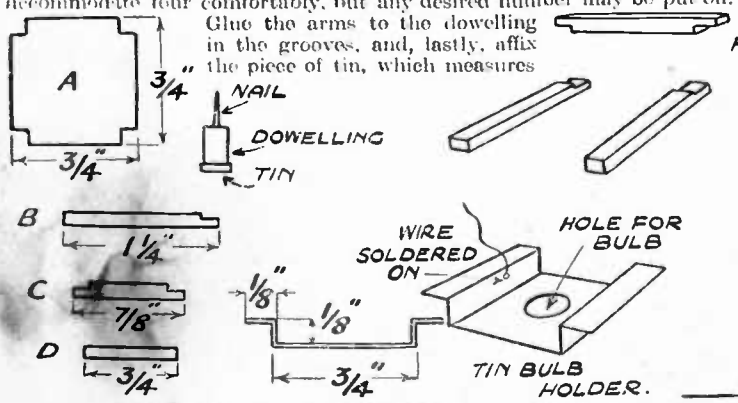


Fig. 1.—Details of the telegraph pole.



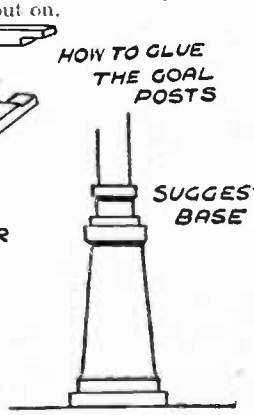


Fig. 2.—Constructional details showing the various parts of the lamp-post; the completed lamp-post being shown on the right.

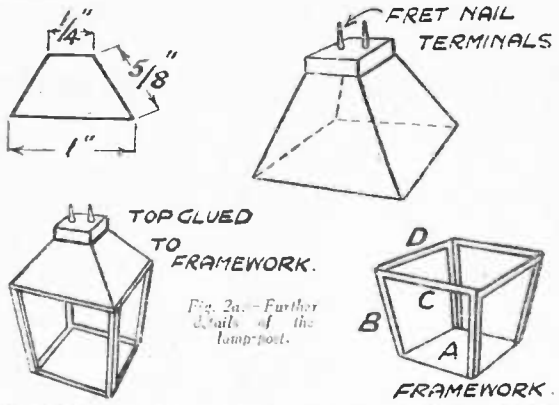


Fig. 2a.—Further details of the lamp-post.

⅜in. x ⅜in., and is bent in half to form a "V"-shaped piece 5/16in. x ⅜in. The pole is now completed, and should be set aside to dry. When it is quite dry, it may be painted with ordinary water-colours, a grey colour for the pole and arms, while the "pots" should be finished white. To give a grass effect, the base should be lightly smeared with glue, and finely-shredded green paper, or wood shavings, previously dyed, rubbed on and allowed to adhere. This pole can be used in conjunction with the lamp-post, carrying the wire (fuse wire will do) which supplies the current for the light, at the same time giving a most realistic appearance. I will describe the lamp-post next.

The Lamp-post.

To construct the lamp-post, take a piece of wood ⅜in. x ¾in. x 1/16in. Cut this to the shape as shown in Fig. 2. (A razor blade will do admirably.) Four matches, each 1¼in. long, should next be obtained, and cut as shown in Fig. 2. Two more, each ⅜in. long, should be cut as shown in Fig. 2, and another two, ¾in. long, should be put on one side. The framework should now be made by taking the matches B and C (Fig. 2) and gluing the chipped parts together (Fig. 2), so that they form two sets of "goal-posts." When these have dried, glue them together with the parts D, to form the frame (see Fig. 2a). This frame is next glued to the base A (Fig. 2).

To construct the bulb-holder, take a piece of pliable tin, ⅜in. x 1¼in., and bend it as shown in Fig. 2. In the centre of the ⅜in. x ⅜in. square thus formed make a hole to accommodate a flash-lamp bulb.

The covering of the lamp is next made as follows:—take four pieces of 1/16in. ply-wood 1in. square, and cut as shown in Fig. 2a. Chamfer the edges, and glue them to form an open pyramid (Fig. 2a). Into the open top place a small piece of dowelling, with a piece of tin nailed on to the bottom, the nail of which goes through the dowelling. Solder a small piece of wire to the bulb-holder, and the other end to a fret nail. Cement the fret nail and the small piece of dowelling into the hole of the pyramid, finishing it off neatly in a square (Fig. 2a) with the two nails jutting out, but not touching. These are the terminals for the light.

Glue the tin bulb-holder to the pyramid, and, when dry, glue the whole to the frame (Fig. 2a).

To make the main post, take a piece of dowelling, ⅜in. diam. and 4in. long, and nail it to the base, a piece of ply-wood, 1⅜in. x 1⅜in. x 3/16in. Obtain a quantity of plastic wood, and wrap it round the dowelling to a height of 1¼in. Model this into the shape of the base as in Fig. 2. Glue the top to the dowelling and the lamp-post is complete. It may be painted with ordinary water-colours, in realistic shades, the base being painted to represent the pavement, with divisions for the flags. To light the lamp, screw a flash-lamp bulb into the hole in the tin until it makes contact with the tin-edged dowelling. Attach two wires from a battery to the protruding nails on the top of the lamp and it should light. If at first it does not, screw the bulb in a little further until it does.

The Fence.

Perhaps the easiest of all is the fence, which can be made with either circular or triangular dowelling. For every 7½in. of dowelling used, take two pieces of wood ¾in. x 1¾in. x ⅛in. and cut as in Fig. 3. All that remains to be done now is to insert the dowelling into the holes already made (Fig. 3) and join together. Paint them realistic colours, and, if preferred, grass-like effects can be given round the base by the same method as for the telegraph pole. These can be made in any lengths, by joining them by putting one half of the dowelling into each side of the upright piece.

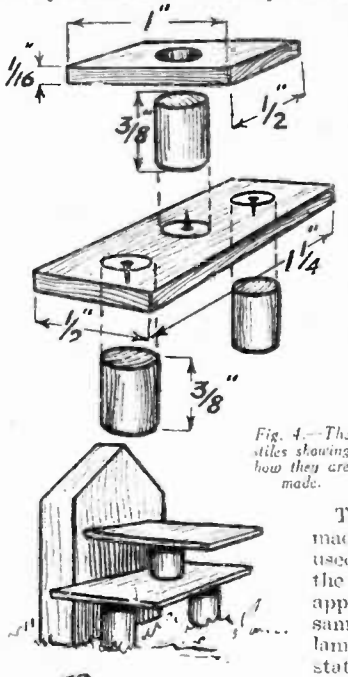


Fig. 4.—The stiles showing how they are made.

Stiles can also be made to fit between the fences if desired. They are simple to construct, ordinary plywood, ⅛in. x 1/16in. x 1¾in. and ⅛in. x 1/16in. x 1in., and three pieces of dowelling, each ¾in. long by ⅛in. diam. being used. They are nailed together as in Fig. 4, and grass effect can be put round the base. These can be inserted between the fencing at any place.

To get the utmost use out of each article made, I suggest that the telegraph pole be used to convey the wire (fuse wire) from the battery to the lamp. This gives the appearance of telegraph wires, but at the same time serves the purpose of lighting the lamp. The fencing can be used between station and station, or between telegraph poles and stations. This gives a more realistic touch to the layout of the model railway.

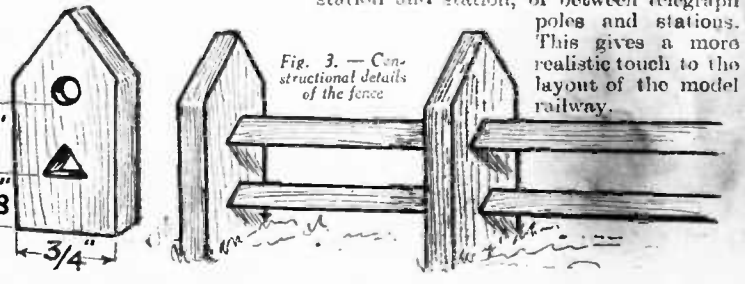


Fig. 3. — Constructional details of the fence

AN INGENIOUS MODEL HARBOUR

By H. Riches

The boats in this novel toy are drawn along by magnets which are fitted underneath the model shipping route.

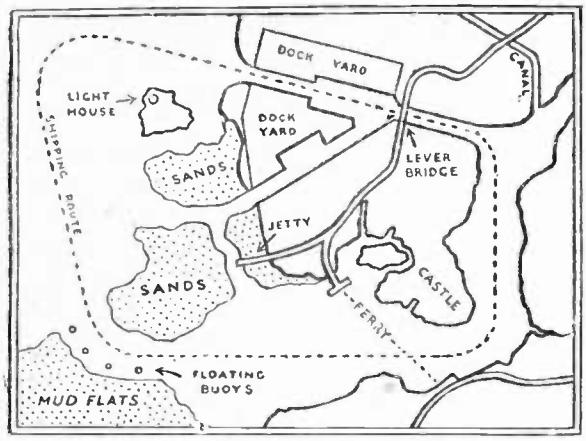


Fig. 4.—The layout of the shipping route.

THIS toy can be made in almost any size. It consists of an aluminium or thin plywood tray containing water and having islands, etc., erected in plaster or putty so that they stand above the water.

Underneath the tray are travelling magnets which draw the model boats along on the surface of the water by attracting pieces of tin attached to the keels of the boats. When constructing the model, one has a choice of several methods for making the magnets travel around the different shipping routes. Probably the best method is illustrated in Fig. 1.

Details of the Baseboard.

It consists of a baseboard on which are mounted a number of wooden wheels. Placed around the wheels is a belt of half-inch tape to which the magnets are sewn. When the wheels revolve, the magnets travel around with the moving tape.

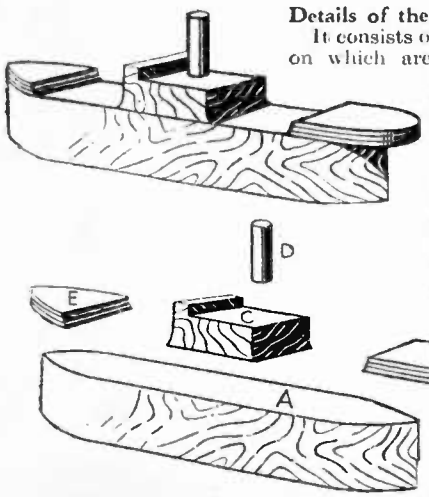


Fig. 2.—The simple method of constructing the boats from blocks of wood is shown here.

The baseboard is marked X. A C D and E are the wooden wheels. F shows the tape and B the magnet. Nails or screws make good axles for the wooden guide wheels. A clockwork or electric motor should be used to drive them. The baseboard, which is the same size as the tray, is fixed underneath it.

Any number of guide wheels may be used, and they may be fixed in various positions to suit the bends and curves in the shipping route, which, of course, will be imitated by the tape.

The Boats.

A simple way of constructing the model boats is illustrated in Fig. 2. An oblong block of wood (A) is cut to represent the hull. The superstructure in the centre of the ship, comprising the captain's bridge and the lifeboat deck, etc., is represented by a smaller block cut to the shape of C. E and B, which represent the forecastle and poop, are of plywood.

The funnel (D) may be cut from a wooden meat-skewer.

All the parts, when glued together in their correct positions, make a realistic model as shown. It is best to use oil colour to paint them with.

The Tin Keel.

This is inserted in a slot underneath the front of the boat, as shown in sketch 3. A in the same sketch is

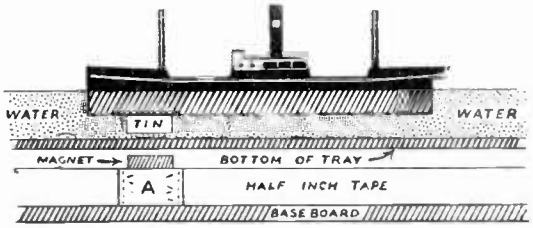


Fig. 3.—Showing how the boats are drawn round the shipping route by the magnet which attracts the tin keel.

a pocket into which the magnet is sewn. Not more than $\frac{3}{8}$in. should separate the tin from the magnet.

A suggestion for the layout of the model is shown in Fig. 4.

The effect of different tides can be obtained by adding or removing some of the water. At high tide the mud flats should be under water.

Additions like dry docks, lock gates, pontoon landing stages and model cargoes, etc., all help to make the model realistic.

It is a good idea to read books on navigation and apply the science to the model.

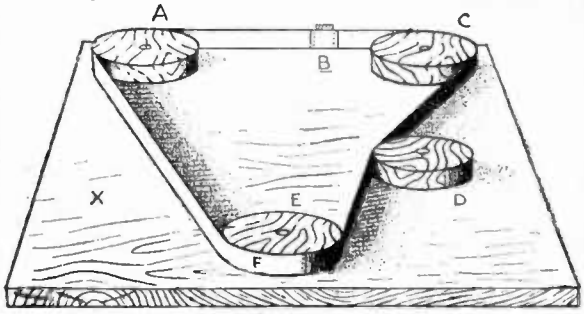


Fig. 1.—This apparatus is fitted underneath the shipping route and is used for drawing the magnets round.

A STEAM PLANT FOR MODEL AEROPLANES

No. 4

By E. W. Twining

(Continued from page 112, October 29th issue.)

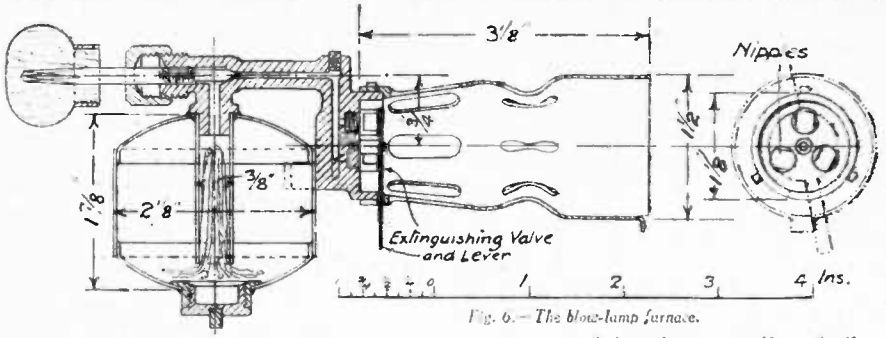


Fig. 6.—The blow-lamp furnace.

The Boiler Casing.

THE form of this, in cross section, was shown in Fig. 5, in the last article. It will be best made of the thinnest sheet iron obtainable, tinned steel if preferred, having a thickness of about No. 30, on the standard wire gauge. It is to be lined very thickly with asbestos card, as shown in the cross sectional view in Fig. 5, which card must be soaked in water to render it pliable so that it can be shaped to fit the curvature of the plate. The tinned, or iron plate, cannot, for obvious reasons, be soldered at the necessary joints, but must be secured together with either rivets or small brass screws and nuts, the latter being, perhaps, the more convenient, because at some time it will become necessary to remove the boiler for cleaning or repairs.

In order to gain access to the union which couples up the engine to the flash coil, an opening will have to be provided in the casing; this may well be cut at the bottom, directly under the union, and will be fitted in with a cover plate secured with screws.

The Blow-lamp.

The general arrangement drawing, Fig. 1, shows that the heat for evaporation of the water is provided by a blow-lamp of the self-vaporizing type. This is shown in section in Fig. 6. Here it will be seen that it is fitted with three nipples, of standard size, screwed into a gunmetal block, cast in one piece with the needle valve casing, and drilled out with ports leading from the valve to the nipples. These ports, three in number, are bored radially towards the centre, and to each of these a hole is bored from the face in which the nipples are screwed. The outer ends of the three radial ports are to be tapped and plugged with three grub screws driven tightly in. One of these screws is shown in Fig. 6.

The Valve.

The valve, screwed as shown, is made from hard-drawn brass rod, filed square at the outer end, and fitted with a fluted wooden knob to serve as a handle for revolving and adjusting the valve. The inner end of the rod is turned to a tapered point, having an angle of about 45 degrees.

The Fuel Container.

The container for the fuel, which fuel is ordinary petrol, is made from either copper or brass, having a thickness of about one thirty-second of an inch. The middle portion is a piece of seamless tubing, whilst the two ends are beaten or spun to shape and silver-soldered in. The lower end must, before fixing, have a collar of silver soldered into a hole cut to receive it. This collar is screwed to take a plug fitted with a cross bar to serve as a filler cap. The upper end of the container is bored to receive a ⅜in. brass tube, which tube is brazed to the valve and nipple casting.

As may be seen from the drawings, the casting is attached at two points to the container; at the top, where the tube passes through the upper end, and by lugs cast on the nipple block. Attachment is made by well silver-soldering.

The Vaporizing Tube.

The mixing and vaporizing tube may also be of either copper or brass. Its making will present perhaps the most, or only, difficult bit of work in the whole plant. Short of making a pattern and corebox and getting it cast in gunmetal, the only way in which it can be shaped is by spinning in the lathe on a hardwood or metal mandrel. If it is spun, the metal will need to be annealed before commencing to work it with the spinning tool, and again from time to time as the shaping proceeds.

A parallel tubular ring will, after spinning is completed, be silver-soldered on the smaller end. This ring will have three bayonet-socket notches cut in it to engage with three pins screwed into and projecting from the circular periphery of the nipple block. It will also have a gap cut in it wide enough to give the necessary semi-rotary movement to the extinguishing valve.

The Extinguishing Valve.

This valve is a thin steel plate pivoted on a collar screwed into the centre of the nipple block. Its shape and action is clearly shown in Fig. 7. The three holes in the plate can be of any suitable diameter, say 3/32in. They are required to be sufficiently large to allow the gas to pass freely from the nipples when the valve is in the open position, and yet not so large that they prevent the nipples being completely closed when gas is required to be shut off.

(Continued at foot of page 140.)

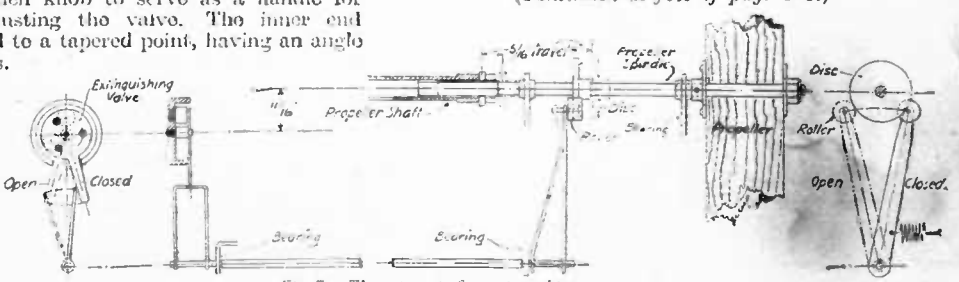


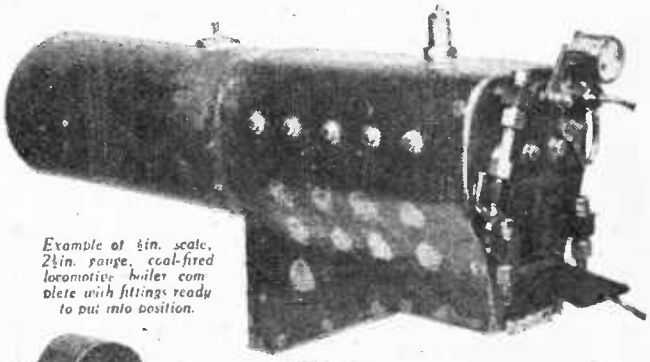
Fig. 7.—The automatic fire-extinguishing gear.

EVERYTHING FOR THE MODEL-MAKER

An interior view of the London showrooms of Bassett-Lowke, Ltd.

THE illustrations below indicate a few of the model-maker's requisites supplied by the well-known firm of Bassett-Lowke, Ltd., St. Andrew's Street, Northampton. Their catalogue, entitled "Everything for Models," which sells at 1s. 6d. and consists of 364 pages and hundreds of illustrations, lists, a sits title implies, everything the model-maker requires, from model railways in all gauges, from O upwards, to clock-work motors, electric motors, model boat fittings, bogies, wagons, enamel, wheels, station fittings, signals, castings, racing yachts, cylinders, etc., etc.

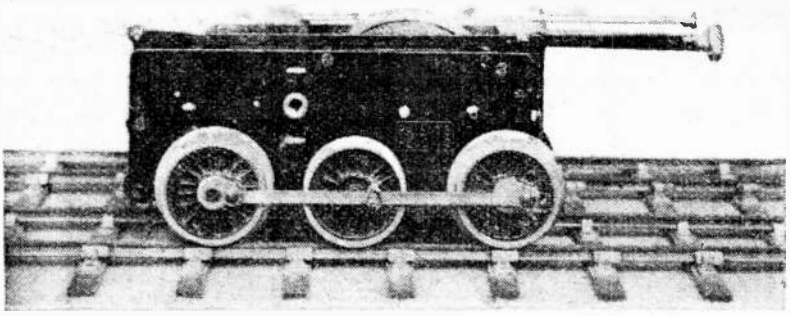
A visit to the London offices of the firm, 112, High Holborn, W.C.1, is an education in itself. One lingers fascinated by the extreme accuracy and realism built into the models. The catalogue referred to is a text-book in itself, and for those who are unable to visit the London office, or the Northampton head office, we strongly recommend that they purchase a copy of this catalogue. The illustrations on this and the next page illustrate but a few of the lines marketed by this well-known firm, but they cannot do justice to the thousands of other requirements of the model-maker, such as unions, couplings, hand force pumps, gauges ejectors, engine and boiler fittings, water gauges, sheet copper, rivets, brass and steel rod, brass sections, screws, tubing, railway fittings, drawings, etc., etc., which you will find illustrated in the catalogue in amazing and fascinating profusion.



Example of ½in. scale, 2½in. gauge, coal-fired locomotive boiler complete with fittings ready to put into position.

Model Otto-type engine, supplied either finished or complete set of castings.

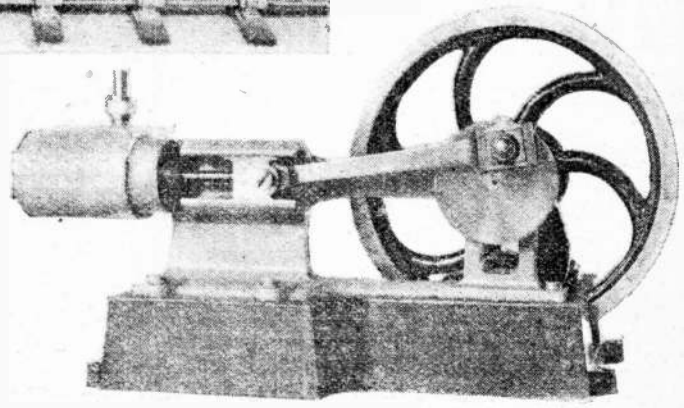
Three popular Permanent Magnet boat motors suitable for motor-boats up to 40in. long and working off pocket dry batteries.

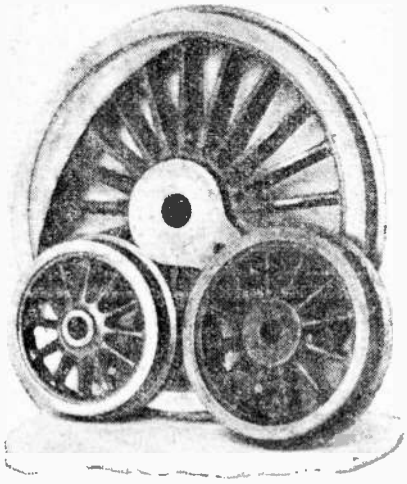


(Left) Six-coupled, all-British, clockwork mechanism, with variable speed gear. An all-British production unequalled by anything yet produced, and suitable for all high-class six-coupled express engines.

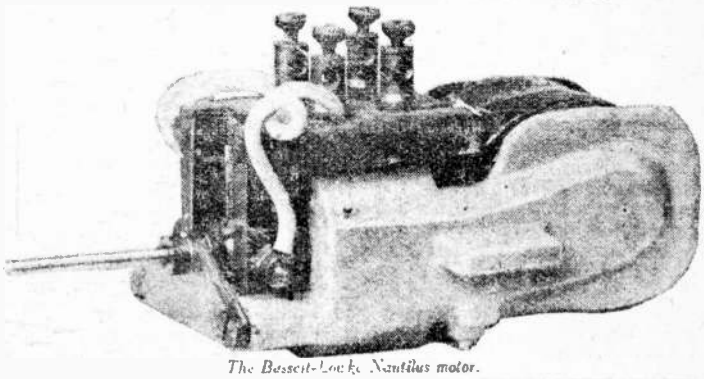
(Below) Tangye type horizontal steam engine, fully described on page 147 of their catalogue, and also supplied complete with Babcock boiler, as shown on pages 150 and 151

Whatever branch of model-making you are interested in, you cannot afford to do without Bassett-Lowke, Ltd., and even if you are not an actual model maker you will find an enormous amount to interest you in the volume.





Driving, bogie, and tender wheels, available as castings and in finished form to a scale of 1in. up to 2in. to the foot scale.



The Bassett-Lowke Nautilus motor.

A STEAM PLANT FOR MODEL AEROPLANES (*Continued from page* 138).

The large end of the vaporizing tube passes through a circular opening in the boiler casing, and has a lip on its lower edge to engage with the casing plate. Other support will, of course, be required for the blow-lamp, but this has not been designed, since it will have to be incorporated in the aeroplane fuselage or framework.

For the initial heating up of the burners and to ignite the first gas formed, either a pan will be required to hold a small quantity of methylated spirit or a wire frame, or rack, filled with asbestos wool which can be saturated with methylated spirit. The latter will doubtless be more convenient, since the spirit cannot be spilled. Such a rack can be formed of stout brass wire silver-soldered together and either made to hang by a loop from the nipple block or be silver soldered to the barrel of the container. The flame from the pan or asbestos wick must be arranged to play around the whole of the part containing the nipples and the inner end of the mixing tube.

To complete the lamp ready for use, the tube leading up to the needle valve must be lightly packed with loose cotton or asbestos wick, the lower ends of this being spread out as shown in Fig. 6.

Automatic Extinguishing.

The apparatus for automatically shutting off the flame when the water in the boiler is exhausted is shown in Fig. 7. As the principle on which this operates has already been explained, and as all the parts in the drawing have written references against them, further description is rendered unnecessary.

When the higher notes are missing RECTATONE restores them . . .

YOU NEED IT *NOW*

Rectatone — the Varley component that restores to their true value the all-important higher notes.

It is by deliberately sacrificing these higher notes that to-day's Superhets and ultra-sharp tuned circuits achieve their selectivity. Now comes Rectatone to put these high notes back again . . . **and millions know they need them.**

VARIABLE COMPENSATION

The degree of compensation may be suited to the particular tuned circuits in use or employed to correct deficiencies due to the loud-speaker or to the acoustics of the room

Compensation is controlled by a variable resistance of about 5,000 ohms connected externally between the terminals H T + and RES

With a pentode output valve a 2,000 ohm fixed resistance may be connected in series with the variable resistance in order to prevent excessive amplification of high frequencies with consequent liability to self-oscillation

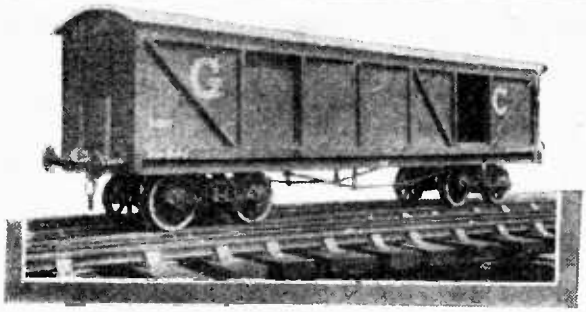
1. Has a rising response curve from 1,000 to 4,500 cycles.
2. Balances any form of sound reproduction.
3. Restores a weakened treble to its correct value.
4. Gives a variable compensation and therefore complete control of tone correction.
5. Gives the required tone-correction without an extra L.F. stage
6. Becomes at will and instantly a normal straight-line transformer

Write for the "BOOK OF THE RECTATONE" Free and Post Free

Varley
(Proprietors: Oliver Pell Control Ltd)

When bass and treble are correctly present, Rectatone preserves them . . . . . When the higher notes are missing, Rectatone restores them

Advertisement of Oliver Pell Control Ltd., Kingsway, London, W.C.2. *Telephone: Holborn 5303.*



Photograph of G C.R. (L.N.E.R.) covered bogie wagon

A HIGH CAPACITY No. O GAUGE BOX WAGON

By "Home Mechanic"

A useful accessory for a model railway.

A MODEL railway is nowhere complete unless it has at least a couple of dozen goods trucks, and the greater interest is obtained where nearly every one is of a different pattern to the other. We have in these pages described quite a few and the present article illustrates yet another bogie wagon of what is known as the high capacity type. Bogie wagons with covered bodies, as exemplified by the excellent model shown in the photograph herewith, are used on express goods trains for the haulage of merchandise which must be kept dry, and if not built with too long a total wheel-base make excellent models.

Any standard goods bogie may be employed. The best type to purchase is that in which the side frames are pivoted to obtain the necessary flexibility on an uneven track.

The Underframes.

These are made in the usual manner (see Fig. 3) with two side members (solebars) built up of 5/16in. by 9/23in. stripwood fastened down to a floor of ¼in. ply with two headstocks and three cross transoms, to stiffen the construction and provide for the carrying of the bogies and the buffers. It will be noticed on reference to the sketch, Fig. 4, that the flooring does not quite cover the whole of the solebars and headstocks. The thickness of the sides and the ends of the body must be allowed for in cutting out the wood that forms the floor.

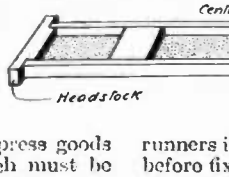


Fig. 4.—Fixing the floor

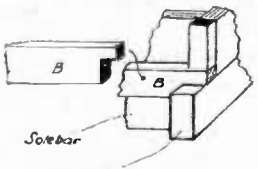


Fig. 5—Building up the sides

The Body

The ends are made up of ¼in. wood which, before being cut out to the shape of the roof, should be scribed with incised lines to represent the planking of the original. Each of the sides of the truck must be formed in three pieces, spaced so that openings for the two doors are left when they are assembled. The three pieces should be laid on the bench against a straight strip of wood and spaced out so that the total length is equal to the overall size of the body. The ¼in. thick strips which represent the uprights and bracings of wood framing of the truck are then glued on and when dry the side may be lifted as one piece. The bottom strip B (Fig. 2) projects over the solebar and is notched at the end, as sketched in Fig. 5, to lap over the headstocks in the manner indicated in the latter drawing.

The Doors.

These are made out of pieces of ¼in. wood sandpapered down so that they slide easily in the upper and lower runners illustrated in Figs. 6 and 7. It will be necessary before fixing the rebated strip forming the top runner to fill in the head of the door-way at the back as shown at H. The lower runner is simply a ¼in. square strip glued and pinned on to the floor.

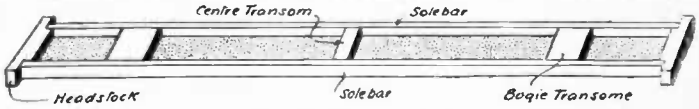
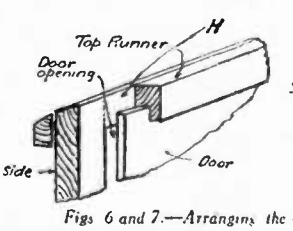
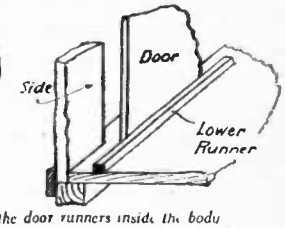


Fig. 3.—The underframe.

Fittings.

Non-lock oval buffers should be employed and the couplings should be fitted so that they can swivel laterally for at least ¼in. on each side of the centre line. The roof may be of metal—sheet aluminium is the best material to use as it bends easily and has no great weight if used in the most desirable thickness, viz.: 1/16in. The ends of the body should have two taper strips glued on as indicated in the drawings and photograph. The painting should be done in flat colours (pigments ground in turps, not oil) and may be lettered in accordance with the practice of the particular railway company the reader is modelling. As illustrated in the photograph, the wagon is lettered for the Great Central section of the L.N.E.R.





Figs. 6 and 7.—Arranging the door runners inside the body

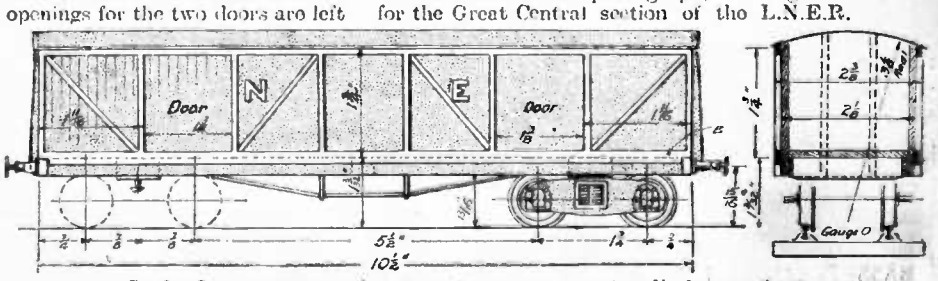
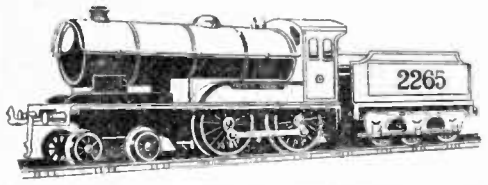


Fig. 2—General design of a model high capacity covered bogie truck for No. 0 gauge railway

BUY BASSETT-LOWKE MODELS—THEY'RE BRITISH

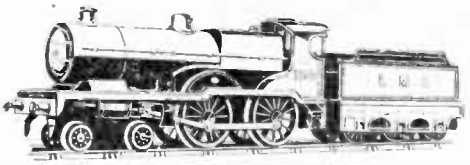
The examples illustrated on this page will give some idea of the realism and craftsmanship embodied in products bearing the time-honoured name of "Bassett-Lowke." These models are built expressly for the boy who is content to drive only "the real thing." They are superior to anything hitherto manufactured.



SCALE MODEL 4-4-0 LOCOMOTIVE "PRINCESS ELIZABETH." This locomotive incorporates the main features of standard 4-4-0 British locomotive design. It is one of the most popular low-priced scale models produced in this country. Finished in L.M.S. or L.N.E.R. colours.

No. 3301/0. 1¼" gauge. Length over all 15". Fitted clockwork mechanism. **PRICE 25/-**

No. 4301/0. 1¼" gauge. Length overal 15". Fitted electric mechanism **PRICE 36/-**

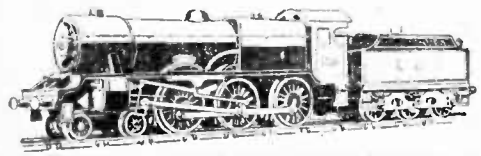


SCALE MODEL L.M.S. RAILWAY COMPOUND LOCOMOTIVE No. 1190.

A most accurate model of the most successful compound locomotives built in this country. Famous for hauling the Euston to Birmingham non-stop 2-hour trams. External details as original and is a most popular model at a popular price.

No. 3302/0. Length overall 15". Fitted powerful clockwork motor **PRICE 37/6**

No. 4302/0. Length overall 15". Fitted electric motor 4-8 volts D.C. **PRICE 45/-**

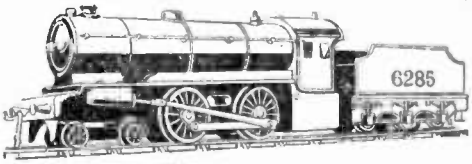


SCALE MODEL L.M.S. LOCOMOTIVE "ROYAL SCOT" No. 6100. This wonderful model has been proclaimed by model railway owners and the trade alike to be the finest British scale model yet manufactured. Its lines and external detail are amazingly like the real thing and includes the Walschaerts valve gear.

No. 3303/0. 1¼" gauge. Length overall 18". Fitted 6 coupled clockwork movement. **PRICE 75/-**

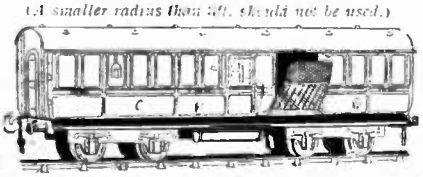
No. 4303/0. 1¼" gauge. Length overall 18". Fitted electric motor 6-8 volts. D.C. **PRICE 75/-**

(A smaller radius than 3ft. should not be used.)

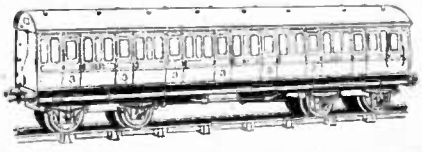


MODEL STEAM LOCOMOTIVE "ENTERPRISE" No. 6285. This entirely new model is an inexpensive steam locomotive, built to scale. Brass boiler, safety valve, filler, whistle, steam dome, double-action cylinders, stainless piston, piston rods and valves, auto-lubricator. Six-wheel tender with steel underframe. Under test this model, hauling 5 long bogie coaches, ran for 50 mins. non-stop, and covered 1⅛ miles. An outstanding production.

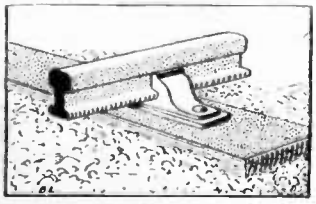
No. 6285/0. 1¼" gauge. Length overall 18½". Complete with tender. **PRICE 50/-**



Working Model L.M.S. Post Office Mail VAN complete with "Pick Up" Apparatus and Ground Gear for gauge 0 tinplate track. **PRICE 30/-.**



Passenger coach, built of steel plate, lined and lettered. Latest type bogie, Mansell anti-friction wheels. Oval buffers. Made in the colours of the four railway groups. 1¼" gauge. Length overall 13". **PRICE 14/6**

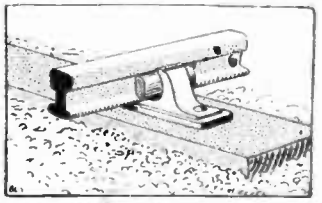


MAKE YOUR OWN TRACK.

Something new at a tempting price.

Solid drawn steel—rustproof. That's the track over which your express should run! This track is something entirely new. You can easily lay it yourself. We supply everything from the rail to the spikes. Quality combined with economy! You can make your own track for under 6d. per foot. Order your parts from list below.

PARTS FOR LAYING YOUR OWN TRACK.



Steel Rails, in 3ft. lengths with clean square cut ends (without fishplates) 2d. per length, 1/5 per doz.		
Fishplates	5/-	per 100
Chairs, keyless, die cast	1/6	per 100
Sleepers, creosoted, 3" long	2/-	per 100
Battens, 36" long	3/-	per doz.
Steel Spikes	1d.	per 100

Extras for Electric Track.

Centre rail brass, in 3 ft. lengths	4/3	per doz.
Centre rail chairs	3/4	per 100
Centre rail fishplates	1/3	per 100
Ready laid track 18" lengths, Gauge 0, curved or straight	Price 2/6 per length.	

Prices of Laid Track in solid drawn brass with keyed chairs. Gauge 0.

	Electric with brass centre rail.	
	Only.	
Straight Track 18" lengths	3/2 each	3/10 each
Curved Track 15" lengths	3/2 "	3/10 "
Points, R. or L.H.	13/3 "	17/6 "

Sleepers and battens are made to small scale permanent standards. The rails will fit any of our small scale chairs. Rails are not merely sheared off in lengths, but all ends are squared and cleaned up.

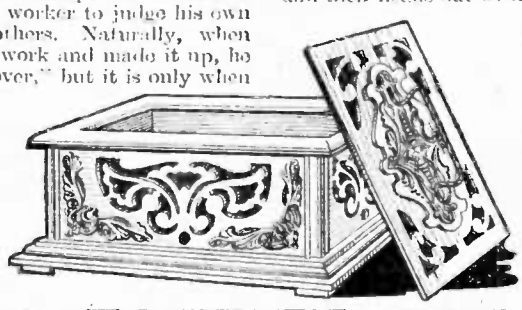
We supply models of every description at popular prices and we welcome your application for the following valuable catalogue which are abundantly illustrated:—"Model Railway Catalogue" New edition now ready No. A/55, post free 6d. "Ships' Models," No. S/55. 6d. post free. Free booklet on "Run your own Train Service" sent on receipt of postcard.

BASSETT-LOWKE LTD. Head Office & Works: NORTHAMPTON. London Branch: 112, HIGH HOLBORN, W.C.1

Hobbies' Gift Design Competition

Here is a chance for fretworkers to test their ability and win a prize. Every reader who has not had the Gift Design sent him should write to Hobbies for it, and ask for particulars of the competition. This article gives you useful hints in making up the Box test piece.

ONE of the most interesting features of fretwork is not only the value of it as a hobby, but so often the result of one's work can be put in an Exhibition and prizes won. Many of our readers write and tell us of the reward they have received in this manner, and we know there is always a keenness amongst them to be able to produce a piece of work sufficiently good to win them a prize. Every year Hobbies Ltd. have just such a competition which is open to all, and which helps a worker to judge his own standard amongst that of others. Naturally, when anyone has cut out a piece of work and made it up, he imagines that it is "the best ever," but it is only when another similar piece cut out by another fellow comes up against it that the differences can be seen. No fretcutter is perfect, and all should be open to learn something from the fact that somebody may be able to work a little better than they.



A TRINKET BOX

A Long Prize List.

Most readers of "Hobbies" who are customers of Hobbies Ltd. will have already received a Gift Design for the making of a small trinket box, and with it particulars of a competition which they are invited to enter. A picture of the box is given here, and no doubt many have already started work upon it. There is an Open Section in which everybody stands the same chance, although previous prize-winners are not eligible for the main awards. The prize list in this is over £10, and a very large number of consolation prizes are being offered to those whose standard is high but not quite good enough to reach the first dozen principal prizes.

Two Sections.

Then, for boys under 16 years of age there is another section in which the first prize is a Gem Fretmachine, and where again there are a large number of awards offered. It may be that some readers have not received this gift, but if they write to The Competition Dept., Hobbies Ltd., Dereham, Norfolk, one will be sent on with particulars of the competition. The Boys' Section of the competition closes on the last day of this year, but the Open Section is not closed until a month later. With the idea of assisting those who are going to make an attempt, these few notes will probably be helpful. The prizes will be awarded for the best cutting, neatness and finish. There are three points to remember because very often a worker who is an excellent cutter will spoil his whole article by putting it together hurriedly and leaving certain little points unfinished. For instance, glue which is squeezed out through joints looks unsightly unless cleaned away. Screws should be driven in square and their heads flat with the work.

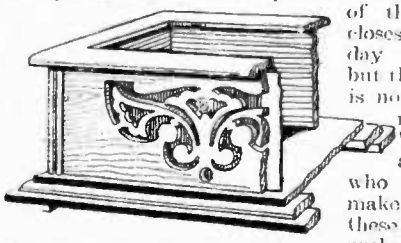


Fig. 1.—A broken view showing how the box is built.

All parts should be cleaned thoroughly if the article is being sent in unpolished. It is better, by the way, to send it in with the wood in its natural state than to finish it off with a bad attempt at staining and polishing. The little metal ornaments, too, are sometimes made to spoil an otherwise good job by the fact that they are not put on square, or that in driving the nails home the hammer has been allowed to dent the embossed work of the metal. Not only in the cutting, therefore, but also in the finish, pay attention to the small details.

It is a great pity to leave the work until the last minute so it has to be put through in a hurry. This means that one has to work at much higher pressure than usual, and in consequence if anything happens—a part becomes broken, or some fittings lost—no time is available for repairing the mistakes, and consequently the work is either too late to be sent in at all, or else is put through so hurriedly that it stands no chance.

A Chance For All.

We want every fretcutter to go in for the competition because they all stand an equal chance. Do not think because you are a novice that you may not be able to cut quite as well as some of the other fellows. Some people are much more adept in, say, three months than others would be in three years. Your work may be as good as some people who have been at it twice as long, but who have not the happy knack of good cutting and neat finish which would win them a prize.

Try Your Skill Now.

It is only by entering a contest in competition with other people that you know whether your own work is up to standard. See that every part is neatly cut and properly cleaned up. Spend some time in checking

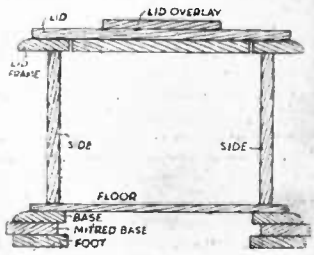


Fig. 2.—A cut through the box showing how the lid fits in place.

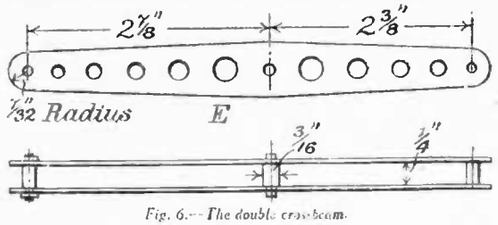


Fig. 6.—The double cross-beam.

MAKING AN ELECTRIC BEAM ENGINE

By A. J. Budd

THE model-maker will find plenty of scope for his skill in the subject of the present article. With the exception of the baseboard and bobbin flanges, all the parts are of metal, the crankshaft and beam working on turned centres to minimise friction as much as possible. By using one solenoid coil, only one impulse per revolution is imparted to the flywheel, but if the parts are properly adjusted, the model will run at a good speed when connected up to a 4-volt accumulator.

Baseboard and Plinth.

These are made with pieces of wood planed to varying thicknesses, as indicated in Fig. 1. The sides and ends of the plinth can be fixed together with glue and fine wire nails about ½in. long. The top and bottom edges must be planed flush, and the top of the plinth chamfered round the top edge. Having done this, mark out the position of the slot for the flywheel and the hole for the solenoid coil. Cut these out with a fretsaw or keyhole saw, and after carefully finishing the edges of the slot with a chisel, fix the top of the plinth to the sides with glue and fine wire nails. The positions of the various holes for fixing screws and terminals can be marked out when the parts of the engine are ready for assembling.

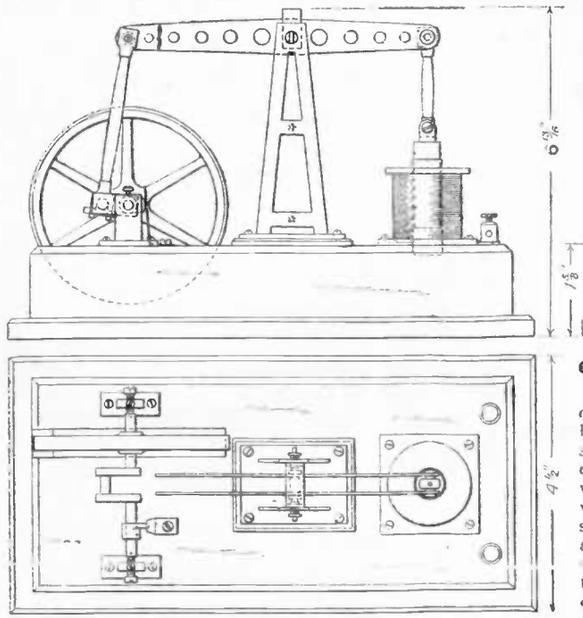
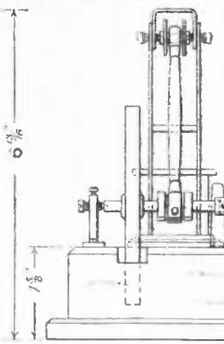


Fig. 3.—A plan, side, and front elevation.

The baseboard is ⅜in. thick, cut to the sizes given in Fig. 1, the top edge being chamfered all round. The baseboard can be screwed to the plinth after the connections are made.

Making the "A" Standards.

These can be built up of sheet brass 1/16in. thick, one side piece being first marked out as shown at A, Fig. 2, and the parts to be removed drilled and chipped out, the edges then being carefully filed up square to the scribed line. When one side is finished, use this as a template for marking out the other side and then treat that one in the same way, finally soldering them together slightly at two or three points so that they register, after which the edges can be trued up together with a fine-cut file, and the holes drilled through both parts where indicated. The distance pieces or stays B can be made from a length of ⅛in. diameter mild steel rod, the ends being turned down to 1/16in., the distance between the shoulders being ⅜in. These ends are to be sweated in place in the holes made to receive them in the standards. For the bridge-piece at the top of the standards, a strip of sheet brass will be required cut to the dimensions given at C, the ends being bent at right-angles so that they just fit between the tops of the standards as clearly shown in Fig. 3. After well sweating this bridge-piece in place, drill the two holes through and tap out with a ⅛in. thread for the beam-pivot screws. These screws should be of steel with conical ends, and may have flats filed on the heads as depicted in Fig. 3, or they can be provided with hexagonal heads.



The baseplate D can be cut out from a piece of sheet brass 1/16in. thick, and four 3.32in. holes drilled at the corners for taking the fixing screws, after which place the standards in a central position on the baseplate, as indicated by the dotted lines, and then carefully solder the feet in place. To give a finish to the baseplate slightly bevel the top edge all round with a file.

Crankshaft.

The crankshaft, the dimensions of which are given in Fig. 4, is built up from a length of silver steel rod 3.16in. diameter, pieces of brass 5.32in. thick being used for the webs. Having marked out the size of the webs, drill the holes in one piece for the shaft and crank-pin at centres 7/16in. apart with a straight fluted drill, and then sweat the webs together and drill the holes through the other web, using the first drilled web as a template. This being done, carefully file the edges of the webs to the proper size and then separate them and remove any superfluous solder. Now take the piece of silver steel and, after cutting off a 2¼in. length and a piece 11/16in. long for the crank-pin, slip the webs on the shaft and press the crank-pin into position. Place the webs in the middle of the shaft, with the inside faces 5/16in. apart, and well sweat all the joints. Now carefully cut away that part of the shaft which comes between the webs, with a hacksaw, and then file up the inside ends of the shaft flush with the faces of the webs, and remove all superfluous solder. The ends of the crank-pin should also be filed flush, and if the soldering and filing are carefully done, quite a strong and neat-looking crankshaft will be produced.

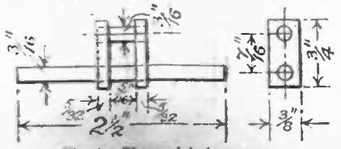


Fig. 4.—The crankshaft.

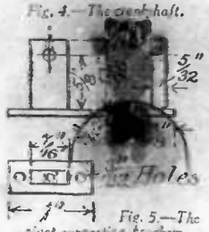


Fig. 5.—The pivot-supporting brackets.

Flywheel.

The flywheel, which should be 3½in. diameter and ⅜in. across the face of the rim, can either be turned up from a casting or purchased ready finished and drilled to fit the crankshaft. The hole in the boss of the wheel must be a good fit to the shaft, and the wheel can be fixed in position by means of a small grub screw in the usual way.

As will be seen by reference to Fig. 3, the flywheel is provided with a balance-weight, this being necessary on account of the weight of the solenoid plunger. A piece of sheet brass 3/32in. thick can be used, and this should be filed to fit between the spokes and then soldered in place.

Pivot-Supporting Brackets.

These brackets, which take the place of bearings for the crankshaft, are each made of two pieces of brass sweated together, the upright parts being 5/32in. and the base pieces 3/32in. thick. Mark out the parts to size and drill and tap out the holes as indicated in Fig. 5, and after filing the parts to the required sizes, take each pair and well sweat them together, holding them in a small screw clamp during the operation.

The pivot screws, which must be of steel, should have their ends either turned or filed conical for the ends of the crankshaft to turn on, and the small pivot-fixing screws in the top of the brackets can be of brass or iron.

The Double Beam.

It will be noticed that the beam is built up of two plates and three short spindles, which act as distance pieces, the two at the ends also serving as pins on which the connecting-rod ends work. Mark out the side plates as shown at E, Fig. 6, on a piece of mild steel plate 3/64in. thick, and centre-punch the positions of the holes, which can be drilled through both plates at once after they have been filed to shape. The distance pieces can be turned up from mild steel rod and the ends threaded to take the clamping nuts, which may either be circular or hexagonal.

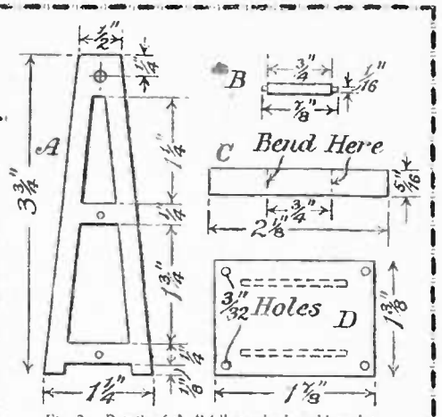


Fig. 2.—Details of the "A" standards and baseplate.

Connecting-rods.

These can be turned up in the lathe from a piece of mild steel rod ⅛in. diameter to the dimensions given in Fig. 7, the ends of the rod F being shouldered down and afterwards threaded with a screw-plate as shown. The shorter rod G only has one end shouldered, the other end being shaped with a file and drilled as indicated.

The large connecting-rod head H may be fashioned out of a piece of brass and partly turned in the lathe, the hole in the end being drilled and tapped out to take the screwed end of the connecting-rod. The head can then be carefully filed to shape, and after this is done a hole can be drilled as indicated at K, the same diameter as the crankpin, and two saw cuts made to meet this hole, the slot being filed out so as to just allow the crankpin to slip in place. The pin L may be cut from a piece of steel rod, and the hole to receive it should be drilled so that the pin does not bind on the crankpin when the latter is in place.

Two small ends, M, will be required, both of the same size and shape, and these can be fashioned out of odd pieces of brass and partly turned in the lathe. The holes N have to be drilled to fit the end spindles of the beam, these spindles acting as pins on which the small ends work, as before mentioned.

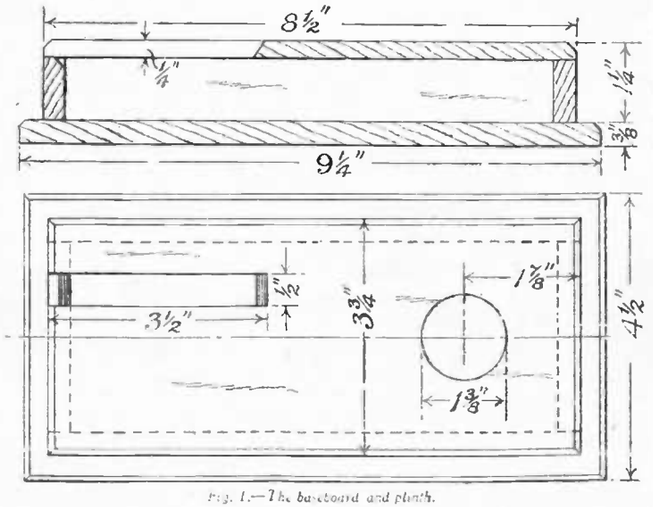


Fig. 1.—The baseboard and plinth.

Solenoid Coil and Plunger.

The bobbin for the solenoid coil is shown in Fig. 8, the central tube, in which the plunger works, consisting of a 1¾in. length of ¼in. diameter brass tubing. The wall of this tubing should not be more than 1/64in. thick, otherwise the magnetic effect of the coil will be weakened. The bobbin ends can be cut out from a piece of oak or mahogany ⅛in. thick, the top end P being 1½in. diameter and the bottom end or base 1¾in. square, a central hole being made in each so that they fit tightly on to the tube. Four 3/32in. holes can be drilled in the base at the corners to take the fixing screws. When these ends are finally slipped in position the central tube should project 3/16in. beyond each end, this leaving a winding space of 1⅛in.

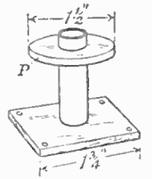


Fig. 8.—The solenoid bobbin.

Wind the bobbin with twelve layers of No. 26 gauge silk-covered copper wire and leave free ends about 8in. long for connecting up purposes.

The plunger R, Fig. 9, consists of a piece of soft iron rod 1¾in. long and of a diameter which allows a very slight clearance all round when it is placed within the bobbin tube. In order to obtain the best results the plunger should be turned to a diameter 1/64in. smaller than the internal diameter of the brass tube. In one end of the plunger a central hole should be drilled and tapped out ⅛in. for a depth of ⅜in., into which the screwed stem of the connecting piece S is to be screwed.

This connecting piece can be filed to shape from a piece of stick brass, the slot being formed by first of all drilling a hole and then making two hacksaw cuts to meet it. After removing the piece of metal, carefully file the inside faces of the slot parallel by means of a ward file.

A 1/16in. hole can now be drilled through to receive the pin T, the hole on one side being enlarged to 3/32in. and the other tapped out with a 3/32in. thread to take the screwed end of the pin.

Connections.

The wire from the coil is connected up as follows: One end is connected to one terminal, and the other end to the screw which fixes the contact spring in place. The other terminal is simply connected to one of the screws which hold the pivot bearing in place, preferably the one nearer the contact spring. The plinth being of hollow construction, the connections may be conveniently made by fixing the ends of the wires to the bottoms of the screws and terminals by a touch of solder, so that the only wire visible above the plinth will be that of the solenoid coil.

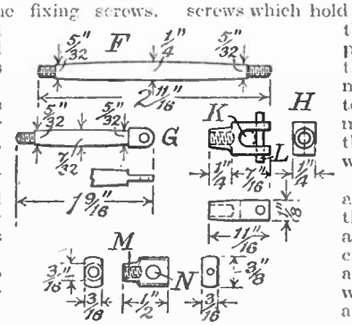


Fig. 7.—The turned connecting rods and ends.

After making the connections and adjusting the pivot screws so that the engine runs easily, a little fine lubricating oil should be applied to all the working parts and also to the spring and contact breaker.

On connecting up the two terminals to a 4-volt accumulator, the engine should run at a good speed, if the foregoing instructions have been carried out.

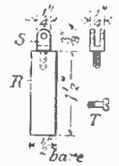


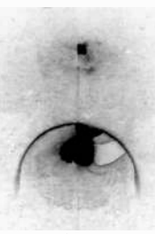
Fig. 9.—The solenoid iron plunger.

CAMERA CHAT—PHOTOGRAPHING FLOWERS.

OF course, the best way of all to photograph flowers is to take them in their natural colours and, if you are satisfied with transparencies, you can do this without much trouble by using either Autochrome, Agfa or Finlay plates as described some time back in a HOBBIES' article headed "Lantern Slides in Colour." Colour photographs on paper of flowers is a much more difficult business, needing a good deal of special knowledge and experience. But ordinary flower photography is within the scope of the humblest worker, and is such a delightful and repaying study that I sometimes wonder why so few amateurs take it up. A really good flower photograph is a thing that grows on you and gives you pleasure long after you have tired of nine-tenths of your holiday snapshots. I myself shall never forget a photograph I once saw at an exhibition of a wild anemone, or "wind flower," as it is sometimes called, taken in its natural surroundings—such a lovely delicate piece of work, with the veining of the petals and the detail of the leaves most beautifully rendered. A youngster could hardly expect to produce a gem like that, but, if he goes about it the right way, there is no reason why he should not make flower photographs which will please both flower lovers and good judges of photography.

Flowers in their natural surroundings are generally difficult subjects, either because it is not easy to take them without including something that you do not want, or because of movement caused by wind. Some flowers, too—primroses, for instance—are usually not get-at-able without a good deal of camera tilting which, unless you are careful and use a long-focus lens, may mean a distorted picture. Assuming that you have got your flower satisfactorily focused, you will be lucky if it keeps really still without some special precautions on your part. The slightest breeze, even a mere "breath of air," will stir a petal or a hanging leaf sufficiently to spoil the necessary time exposure—for snapshot close-ups of flowers are out of the question. The remedy for this is to make a little temporary windscreen for your flower with pieces of stout card or thin wood, or, better still, a framework of wood or wire with lawn or other suitable fabric stretched over it. The last-named will act as a screen without interfering unduly with the light, and with a little ingenuity you can construct a portable miniature flower studio with both top and side screens to shut off any inconveniently strong sunlight as well as wind.

Not much need be said about these, as success depends at most entirely upon personal taste in selection and arrangement. But the main things to study are simplicity and naturalness. Two or three blooms with a little appropriate foliage make a far better picture than a crowded bunch, and anything like an elaborate setting is usually a dismal failure. A little sand or mould at the bottom of the vase is often a help both in arranging flowers and keeping them in position more naturally than wire or glass contraptions. Backgrounds should be as simple as possible. Plain white, or tinted art paper frequently serves as well as anything.



the various pieces when completed, and fitting them in place temporarily before finally building them up. If you see a carpenter or a picture-frame maker at work, he will spend what seems an unnecessarily long time over marking, testing, and temporarily placing. Then, finally, when the parts do go together, there is no trouble at all. It should be the same in any piece of work, and particularly in the competition piece.


Fig. 3.—Where the nails should be fixed to hold the metal ornaments

Be careful with drill holes, whether for the sawblade or for screws. Make them neatly and in the right position. In gluing use as little as possible, but rub it well into the surface of the wood—preferably with the tip of the finger—so that it covers the whole surface and gets a good grip of the other parts. Finally, of course, every part must be thoroughly cleaned up, the finishing rubbing being done with a fine grade of sandpaper so that the surface may not become scratched. Little corners and quirks have to be attended to as much as, and possibly more than, the ordinary plain surfaces, because it is on these little points as well as the main question of cutting that the judges work.

The General Construction.

Let us first note the general construction of the box. A glance at Fig. 1 gives a clear idea how it is made up, for this is a broken away view of the whole box, showing the various parts necessary for its construction. The two long sides fit between the two ends, and should be glued at an accurate rightangle together. They can also be nailed through from the ends—small fret-nails being used—because the heads of these will be covered by the fancy moulding used to cover the butt joint at each corner. This moulding is cut the same length as the height of the sides. Be careful to cut it off true with a small tenon saw, and do not attempt to clean it up with the sandpaper or the ends will become rounded and not stand flush on the base and lid.

The Base.

The whole hollow framework of the box stands on a floor cut from ¼in. wood and can there be glued and screwed an equal distance from the edge in each direction. Screw it up from underneath, and then glue on the shaped base. This base is 3/16in. thick and the upper edge is rounded off. Do this carefully with a plane, and finish off with a fine sandpaper. The marks on the pattern at each corner show exactly the line to which the rounded edge must be taken, and also indicate the position of the mitred base below.

These four strips are 3/16in. wood cut at an angle of 45 degrees at each end, so that when placed in the form of a hollow rectangle the base itself will stand upon them, leaving a projection of about ¼in. all round. The mitred base should be glued together, and then the base itself stood upon it. Four small feet at the corners are fitted. They are cut from the waste wood of the hollow base, and then glued ¼in. inwards from each corner. A sectional drawing at Fig. 2. shows their position, and the various other parts mentioned.

The Lid.

At the top of the box is a lid frame. This is an open rectangle glued down to the upper edges of the sides and ends. Its outer edge is rounded, a long shape being given to the top and a slightly rounded piece underneath (see Fig 2). The pattern of this part is shown as a whole piece, but with a cutting line by means of which one takes out the centre portion. Cut round this line with a fine saw, making the drill hole inconspicuous in one corner. It is advisable before gluing this lid frame to the sides to fit in the lining. This lining is a special American cloth supplied with the wood. It should be cut exactly the same size as the ifterior surface of the upright sides, and glued carefully in place with the bright side outwards. The lid frame—the outer portion—is then glued in place on the box with an overhang equally all round.


This is the moulding which is used to cover the corner joints.

The piece which came out of this frame is used to back up the lid itself, and so serves to hold that part in place. The lid has a fretted centre, and when this has been completed and cleaned up, the piece from the centre of the frame is glued beneath it.

The Fancy Handle.

On the top of the lid comes an overlay of wood on to which is nailed the metal handle. In addition to this, there are two ornamental corners on the long sides. They are illustrated at Fig. 3, where an indication is given of the position at which the nail holes should be made. In the corners there is a hole already punched, but two others must be made at the other extreme points. In the handle there is a hole at each end, but one must be made on each side also. Drill the holes with a fine bit, and run in ½in. iron nails because the handles themselves are of silver shade. See that the whole of the metal ornament lies flat on the wood, and do not attempt to hold it in place by using glue.

Sending in the Entry.

When the box has been completed wrap it up carefully and send it along to the Competition Dept. with the necessary entry form. In packing, use a tin or wooden box so the article does not become damaged in the post. It is a pity to have spent so much time on the actual work only to have it crushed and spoilt on its way to the judges.

Naturally you will want to have the competition piece back after putting so much work into it, and it will be sent if you enclose sufficient postage when you send in the entry. Attach a Postal Order for 6d. to the Entry Form, and state that you want it returned. It will be sent back after the completion of the judging.

Particulars of the necessary wood and fittings are given on the design sheet. Entries for the Boys' Section must be in by December 31st; those for the Open Section January 31st, 1933. They can, of course, be sent in any time before those dates.

No. 1933 5-11-32

Hobbies DESIGN

PRICE 4D.

Note : Extra copies of this design may be obtained from Hobbies.

Size of Frame.
14¼ in. Long.
12 in. High.

The arrows indicate the direction of grain of wood.

Supplement to Hobbies No. 1933

THE "LION" PICTURE FRAME

FOR THREE PICTURES.

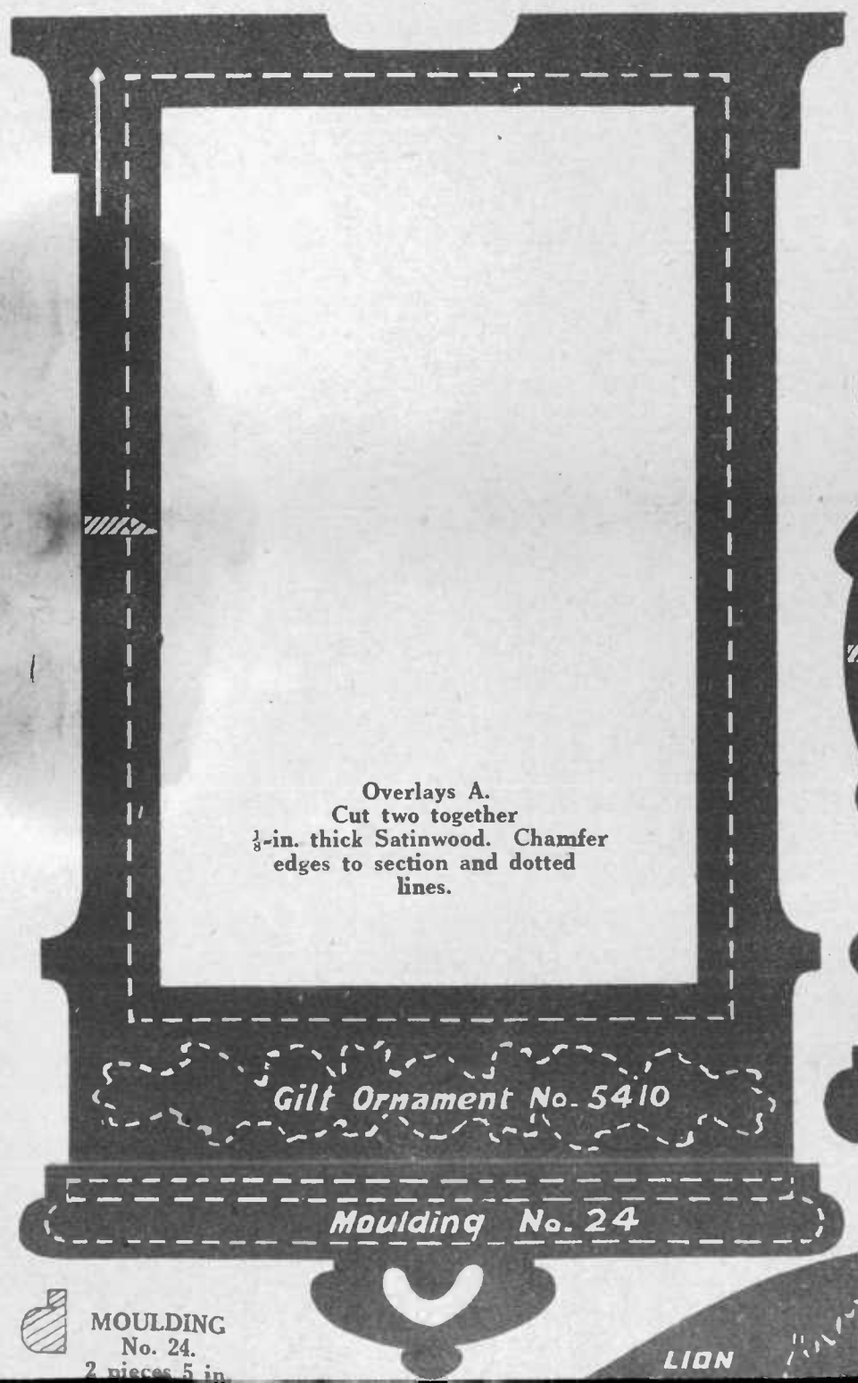
FRETWOOD & FITTINGS.

FRETWOOD.—For this design a panel of Mahogany wood is supplied, with Satinwood for Overlays, and sufficient No. 24 Moulding. 3/-, post free 3/6.

FITTINGS.—2 Brass Ornaments No. 5410, 4d.; 2 Glasses No. 5802, 4d.; 1 Glass No. 5814, 2d. Postage 4d.

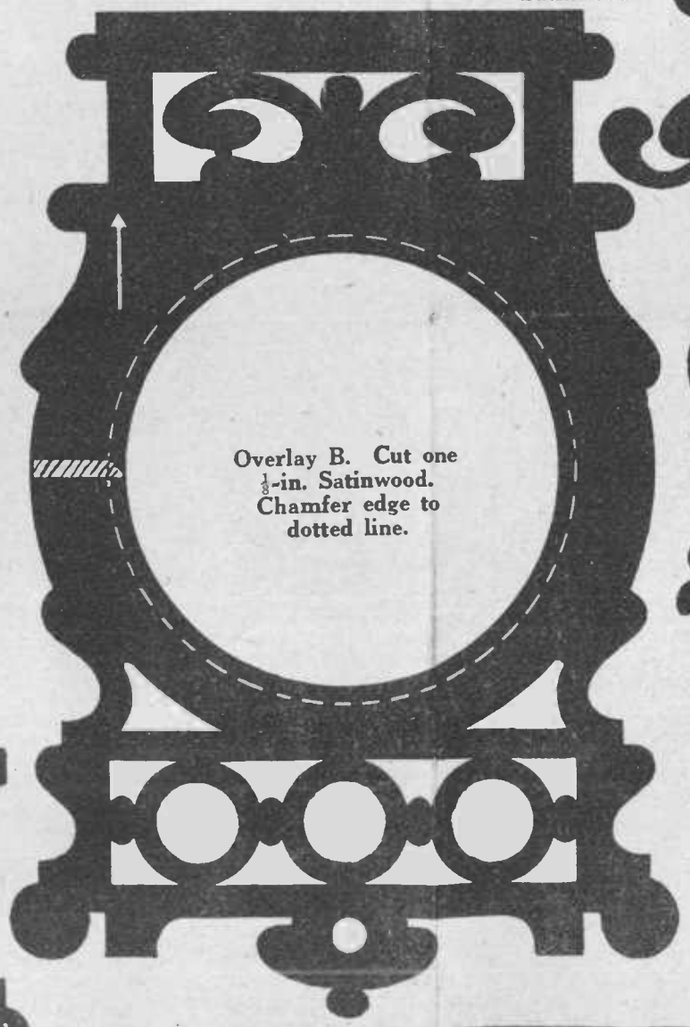
Postage on complete parcel 6d.

The above prices are subject to alteration without notice.



Overlays A.
Cut two together
⅛-in. thick Satinwood. Chamfer edges to section and dotted lines.

MOULDING
No. 24.
2 pieces 5 in.

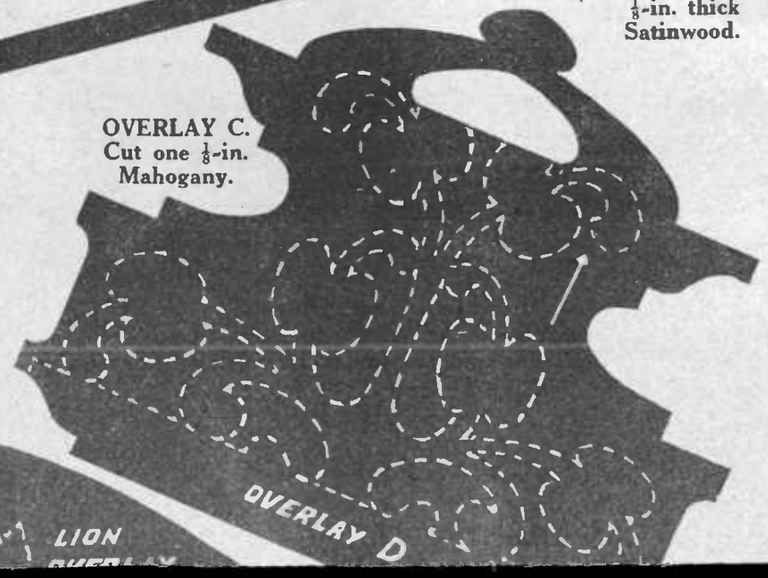


Overlay B. Cut one ⅛-in. Satinwood. Chamfer edge to dotted line.

OVERLAY D.
Cut one ⅛-in. Satinwood.

LION OVERLAYS.
Cut two together ⅛-in. thick Satinwood.

OVERLAY C.
Cut one ⅛-in. Mahogany.



LION

LION

long required.

OVERLAY HERE

OVERLAY C HERE

OVERLAY HERE

ADDRESSES.

All orders by post should be addressed :—
HOBBIES LIMITED, Dereham, Norfolk.

Customers residing in the neighbourhood may obtain Tools, Wood and Fittings by calling at the HOBBIES' Supply Stores.

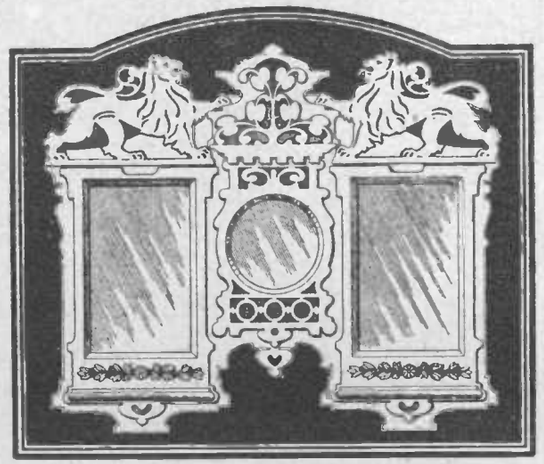
LONDON : 94 High Holborn, W.C.1.
" 147 Bishopsgate, E.C.
" 83 Newington Butts, S.E.11.
GLASGOW : 326 Argyle Street.
MANCHESTER : 10a Piccadilly.
BIRMINGHAM : 9a High Street.
LEEDS : 10 Queen Victoria Street, Briggate.
SOUTHAMPTON : 25 Bernard Street.
BRIGHTON : 68 London Road.
SHEFFIELD : 4 St. Paul's Parade.

TORONTO, CANADA : 54 Wellington Street West.
And of all HOBBIES Authorised Agents.

Glass No. 5802

Glass No. 5814

OVERLAY B HERE



Note : Cut all the overlays for this design with Hobbies fine grade fretsaws.

Glass No. 5802

OVERLAY A HERE

OVERLAY A HERE

FRAME. Cut from "A" Panel of Mahogany. Dotted lines indicate positions of overlays.

PRINTED IN ENGLAND

For the FRETWORKER

The LION PHOTO FRAME

THERE are amongst our readers, we know, a very large number who like to undertake a real piece of fretwork and to make up one of the photo-frames which are so popular. A wide range of these is given in Hobbies current catalogue, but there is still a demand for more, and we are sure that the one this week will be as popular as any of its predecessors. As can be seen from the illustration, it is a frame to hold two postcard-size pictures, and a central circle which holds a smaller portrait up to 2½in. wide.

The Wood to Use.

The complete frame is 14½in. long and 12in. high, but there is so little actual fretwork in the backboard itself that the work can be undertaken quite easily with a 12in. frame. The overlays are, however, cut from much smaller pieces of wood, and should be taken from boards of quite a different material from the main board. Thus, mahogany should be used for the frame itself, with the overlays cut in satin-wood. The former is the popular red shade, whilst the satin-wood is lemon which serves as a distinct contrast from its background.

Cutting Parts Together.

The patterns for most of the parts are shown in full on the design sheet, but in two instances duplicates will have to be made. As, however, these two parts are cut from ⅛in. wood, two boards of that thickness can be nailed together and the piece cut in duplicate. This applies to the overlay A, which goes round the larger opening in the frame. It also applies to the lion overlays, two of which are required.

Cut out the patterns from the design sheet, keeping close to the outer edge of the actual printed portion. Paste them down on to the wood with the grain running in the direction indicated by the arrow. Put the paste on the wood itself, and in the case of the large pattern of the back be careful to pad it down from the centre first, out towards the edges, in order to get it flat and without air bubbles beneath.

How to Put Down Patterns.

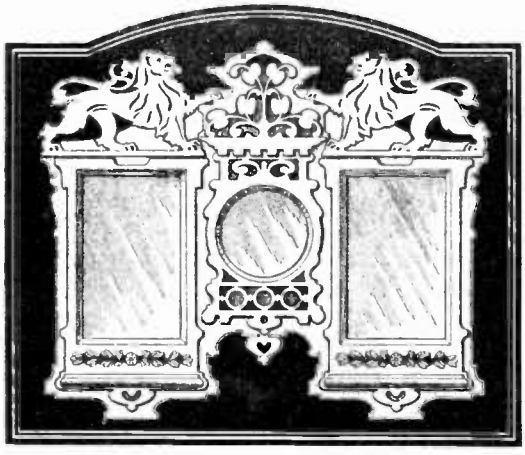
Another plan is to turn it on to a piece of thick dowelling or a round ruler, and roll it off on to the wood direct. The overlay patterns are pasted down in a similar manner, and in doing this it must be remembered that all are cut from satin-wood with the exception of overlay C. This is in mahogany, in order that the overlay which comes above it (in satin-wood) stands out in the necessary relief. This mahogany overlay C also serves as a pediment for the upraised paw of the lion to rest upon.

Do not, of course, attempt to cut patterns before the paste has dried, or the paper will tear up, or the lines become blurred with damp sawdust. Cut out the framework of the main back first, laying the three pieces of glass actually in position before doing so, in order to ensure that their sizes are not too large.

Cutting Overlays.

Any of the overlays can be cut next, and as they are in ⅛in. wood, it is advisable to take out the interior fretwork first and leave the outer edge until last. This provides a more substantial board to hold during the cutting. Have a sharp, medium-grade saw, too, so that the blade does not tear the wood or get caught and break off any of the delicate projections. All the overlays can be cut, and each should be cleaned up in turn as soon as it is completed.

If the cleaning-up process is left until all have been cut, the work is apt to become monotonous, and bad workmanship result. Use a fine grade of paper on a proper block, or an odd piece of wood in order to keep it flat on the surface. Give the back of the wood a rubbing as well as the front, in order to take away any rough edges which may have been left, and also, take the fine point of a file or a similar instrument to get dust of the pattern may into the corners where have accumulated.



MATERIALS ARE SUPPLIED.

Fancy fretwood for all parts, with sufficient moulding, is supplied for 3/-, or sent post free for 3/6. The three glasses cost 6d., and the two metal ornaments 4d. Postage on the fittings is 4d., but only 6d. if wood is ordered with them Obtainable from any Hobbies agency or by post from Dereham, Norfolk.

Sandpapering.

This cleaning-up process must be undertaken as thoroughly as the cutting, because it is a pity to spend so much time with the fretsaw and then spoil the work by putting it together in a slipshod or half-hearted manner. Test out all the positions with the adjoining parts, and spend a little time seeing that all are accurate. The actual work of cutting forms only a small portion

of the labour involved. When all the parts are cleared however it is a straightforward matter to put them together

The Two Lions.

Two of the lion overlays have been cut, but as they appear on the frame the opposite way round, obviously the second part cut will have to be turned over This must be remembered in cutting in order to maintain a perfectly upright blade so that the figure work and the long narrow lines of those parts are not distorted in any way. For the wide lines, by the way, which form the mane of the lion, a very fine drill should be used and an equally fine sawblade. The blade must be held very tight in the frame, and the frame in turn, held very firmly in the hand.

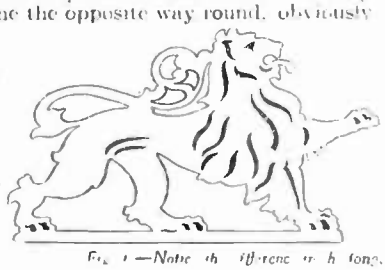


Fig. 1.—Note the difference in the long, narrow cuts One is good, the other bad

Thread it through the drill hole, and then carefully cut down to the extreme point of the long narrow angle. Take the sawblade up to the drill hole, and then cut down the other side of the narrow neck of wood. Be careful that the blade does not jump across, but gradually put it towards the other cut until a single fine line is obtained. This is not the easiest work, but it proves the ability of any worker. The right and wrong method of doing this feature is clearly illustrated at Fig. 1.

The first overlays to glue in place are the two surrounding the rectangular openings on each side of the centre. Get them in position so that there is an equal projection all round, thus serving as a rebate to hold the glass in position from behind. The overlays are decorated at the bottom by a piece of moulding and the metal ornament, but both these can be left for the present

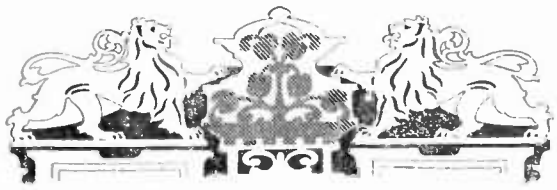


Fig. 2.—The three layers of wood in the lion of the main

Fixing the Overlays

The central overlay can be next glued in place. Here, as before, an equal overlap all round the circle must be obtained, and the part put on upright on the centre line. On the top edge of the overlay is actually stood the overlay C, and it is essential to cut the edge of these two different pieces quite true, so that they may come together as a single line.

As previously mentioned, the lions are cut from ¼in. wood and glued above the large overlays A so that the raised paw rests on a piece of the overlay C. When the lion is laid in place, it will be noted that there is a gap between it and the overlay round the frame and the lower edge of the lion overlay. This gap must be parallel and care taken that the lion is not tilted up one end or the other. The part is glued to the back frame, but is only held by a portion of the part.

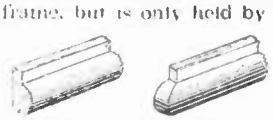
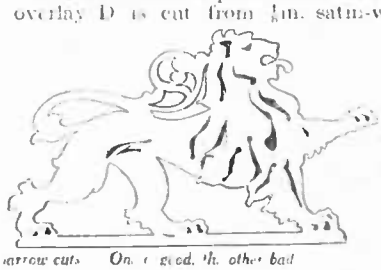


Fig. 3.—How the ends of the moulding are turned back.

The Lions Stand Out

Put the overlay in place and then pencil from behind the shape which actually covers the main frame. Take the part away and apply the glue to this piece, returning the wood to its former position and holding or cramping in place until the glue is set. As the lion overlays project above the top of the frame they are made to stand out in quite strong relief from the rest of the work.

In order further to provide contrast, a fancy ornamental overlay D is cut from ⅛in. satin-wood and glued on to the mahogany overlay C This little fancy overlay has what is known as a dentil course along its bottom edge, and this portion serves to cover the join of the two overlays B and C. It extends to the extreme edges, and adds the finishing touch to the whole thing. An enlarged drawing of a portion of the overlays at the top of the frame is given at Fig. 2, and this clearly shows the various positions in which they must be fixed. Remember in fixing them not to apply the glue thickly, but to see that it covers the whole of the surface of the wood evenly. It is best put on with the tip of the finger, rubbed all over, and well into the grain. The glue will grip firmer if it is left until tacky.



Shaping the Moulding.

Mention has already been made of the moulding and metal ornament which decorate the overlays on each side. A piece of No. 21 moulding is cut 4¼in long, and then the ends are returned to be the same shape as the front. This can be done with a medium-size file, so that the finished result is as shown in Fig. 3. The end is rounded so that it comes not only the shape of the front of the moulding, but also parallel with the rounded edge of that portion of the overlay upon which it is glued.

The ornamental overlay illustrated at Fig. 4 is of embossed metal gilt in colour, which adds a striking touch of brightness below the glass of the frame. This overlay is held by three pins or very fine nails. One is driven in the centre and one at each end, a hole having been previously made with a fine drill bit. Do not press the drill too heavily on to the metal, or it will flatten it out. Get the bit revolving rapidly before putting on enough pressure at the top of the drill to cut through the thin metal. Use 3 16in. brass nails, and drive them home carefully to hold the overlays straight and close to the wood.

Putting in the Pictures

The three pictures are fitted in behind the glass from the back, and the piece of wood which came out can be replaced in position as backing boards. A better plan, however, is to use a piece of card to fill the aperture, and then to cover the whole thing over with a piece of brown paper, or to hold it in with the small photo-clips specially provided for the purpose.

Fig. 4.—The gilt metal ornament to be fixed

What a difference the *quality* of Johnson's Wood Dyes makes! They are genuine oil and spirit dyes. They are easy to apply — no laps, no streaks, and they do not raise the grain.

One sweep floats the colour right down into the wood. They are permanent and penetrating. They won't flake off nor fade.

Note this — 19 different colours, each one classified and numbered, and made to formula so that there is no difficulty about matching up at any future time. The trial bottle — 9d. — for your next job. Larger sizes 1/3d., 3/- and up.

JOHNSON'S WOOD DYES

S. C. Johnson & Son, Ltd., West Drayton, Middlx.

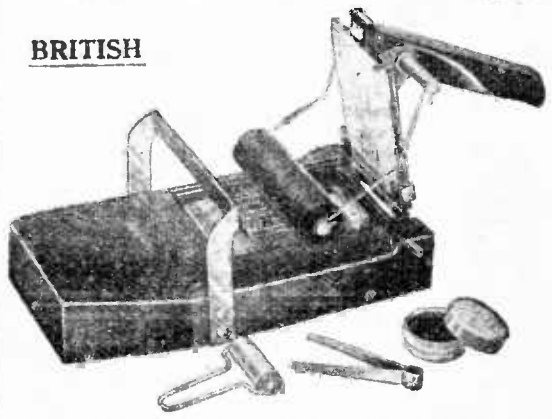
MAKE MONEY
IN YOUR SPARE TIME

BY PRINTING

BUSINESS CARDS
FOR FATHER

VISITING CARDS
CONCERT TICKETS
DANCE PROGRAMMES
INVITATIONS. PRICE
TICKETS, LABELS, &c
FOR YOUR FRIENDS

BRITISH



NO PREVIOUS EXPERIENCE REQUIRED

It is impossible to tell whether printed matter done by it has been printed on a

REAL PRINTING PRESS
"BABY" ADANA

Complete Plant includes Ink, Tweezers, Hand Roller and Fount of Rea. Printers Metal Type and Full Instructions.

10/6

For larger jobs such as Pamphlets, School Magazines, Letter Headings, etc.

"SENIOR" ADANA .. .. *Complete Outfit* **57/6**

Write for actual specimens of work

On sale at all Large Stores and Toy Shops, or if any difficulty, write direct to Frank Pitchford & Co. Ltd., Well Street London, E.C.1.

The "impossible" made possible!

Mr. Cavendish, of West Derby, Liverpool, experimented to find a Glue that would enable him to make a violin from matchsticks! He found it in Croid. 5,500 matchsticks and 20 tubes of Croid No. 3 were used. Result, a sound instrument of sweet tone.
Whatever job you have needing Glue insist on Croid—British, Best, Strongest and most economical of Glues.

Croid Glue can be obtained in Tins or Tubes. Of Stationers, Ironmongers, and Stores.

Croid

IMPROVED LIQUID GLUES CO., LTD.,
Imperial House, Kingsway, London, W.C.2.

"MODEL AIRCRAFT"

The monthly magazine for the model aeroplane builder.

From newsagents and bookstalls.

Price 6d.
Direct 7d. Post Free.

Price list of Model Aeroplane Kits 1½d. Post Free.

MODEL AIRCRAFT SUPPLIES,
171, New Kent Road, London, S.E.1

A WONDERFUL INVENTION.

Price **27/6** Post free.

Extract from "Popular Wireless"—"*The amplification obtained was equal to that of a two-valve amplifier.*"

The Wilson Bar-Amplifier works loud-speaker from Crystal Set. Weakest reception can be made loud and clear. Enables the deafest to enjoy wireless.

A Really Perfect Electric Soldering Iron
Full guarantee with each instrument.

No valves. H.T. upkeep expenses.

Mod. 60W 8/6
,, 150W 12/6

Any voltage supplied post free. Works in two positions.

THE IMPROVED WILSON MICROPHONE & ELECTRICAL CO., LTD.,
15, PRINCE OF WALES TERRACE, CHISWICK, W.4.

ELECTRIC SOLDERING

. . . . the ideal method for the Model Engineer and Wireless Constructor. Electric Soldering is

SPEEDY switch on—ready in four minutes

CLEAN no flame—hence no dirt

EFFICIENT constant heat maintained in the bit

RELIABLE no jobs spoiled through bit cooling off

ECONOMICAL 15 hours' use for 1 unit

For every "handy man"

SOLON

7/6 EACH

ELECTRIC SOLDERING IRON

(PATENT NO. 243928)

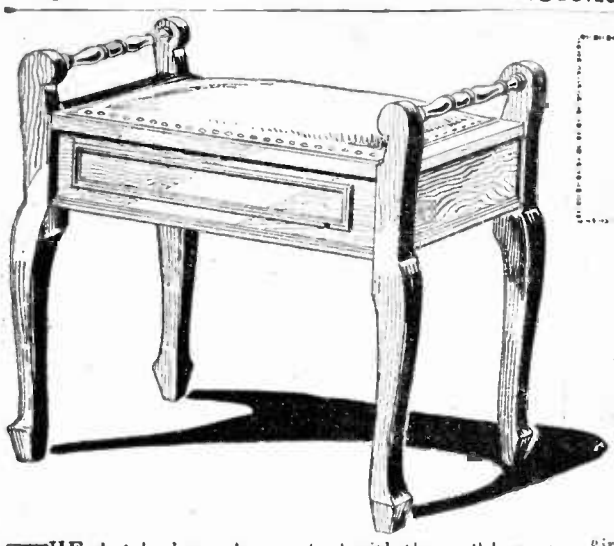
Post free in Gt. Britain and Northern Ireland

Complete with flex and adaptor. Made for standard voltages. Also supplied with 3-wire flex giving earth connection. (State voltage and type when ordering.)
Write for illustrated leaflet YH 28.

Ironmongers . . Electricians . . Radio Dealers . . Stock . . Solon
(or direct from)

W. T. HENLEY'S TELEGRAPH WORKS COMPANY LIMITED
DEPT. YH 28 — HOLBORN VIADUCT — LONDON — E.C.1.

BRITISH THROUGHOUT



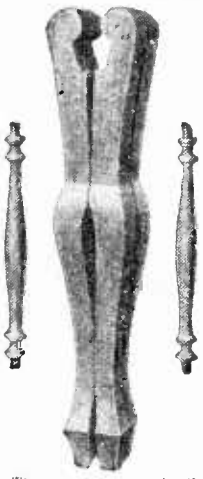
A HOME-MADE MUSIC STOOL

There is no hard work attached to making this piece of furniture because the legs and rails are obtainable ready shaped. It can be built in oak or mahogany by any amateur carpenter. Material is supplied for all the parts.

THE sketch above shows a tool with the well-known 'Louis' type of leg, and a useful box under the seat for containing music. The top or seat is framed and stuffed and covered with suitable material and hinged to one of the side rails to open. It is provided with a stay for holding it in an upright position while in use. A little care is needed in setting out the mortises and tenons for the legs and rails, but beyond this the work is of a very simple nature and easily done with the ordinary kit of tools.

The Shaped Legs.

The stool should be completed in beech or mahogany or even in oak. A big advantage is that the legs and two rails forming the handles are supplied (in beech) ready cut to shape. They can be purchased from Hobbies for 9s. the set, the number (524) being quoted when ordering.



These are the legs and rails supplied ready shaped to fit in place

The first job will be to prepare the legs. These are shown in Fig. 1 which gives the outline of the tenon on the left side of the figure and the position of the side rails, and floor, etc., on the right of the sketch. Fig. 2 shows the mortises the square inside face of the leg to the mortise will be $\frac{5}{8}$in., the width of the mortise itself $\frac{1}{2}$in., thus leaving about $\frac{1}{16}$in. margin on the outside of the rails when these have been glued in. Cut the mortises with a $\frac{1}{2}$in. bit to a depth of $1\frac{1}{4}$in., and clean out with a $\frac{1}{4}$in. chisel. After the mortises have been cut and cleaned, mark off the centre of the top scrolls of the legs and bore holes with the $\frac{1}{2}$in. bit $\frac{5}{8}$in. deep for the ends of the turned rails.

The Rails.

The long side rails are cut from two pieces of $\frac{7}{8}$in. thick wood $18\frac{1}{2}$in. long and 5in. wide. Square them up, and mark back a line at each end $1\frac{1}{4}$in. for the depth of the tenons. Each tenon is 3in., sawn with a tenon saw to $\frac{1}{2}$in. wide and cut to a mitre of 45 deg. at the ends. The same procedure is carried out for the short end rails, which are 13in. long, with the two tenons. The measurements for the tenons is the same as for the side rails.

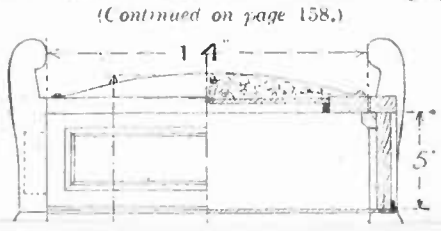
When all the cutting and cleaning has been done, glue the short rails and the turned handle rails. Then each pair of legs are fitted to the side rails, and glued and cramped.

Pieces of $\frac{5}{8}$in. triangular fillet glued in the angle formed between the legs and the rails (Fig. 3) will strengthen the framework.

Making the Seat.

The seat frame may next be taken in hand. Fig. 4 explains how this is made. Two rails 16in. long by 2in.

(*Continued on page* 158.)



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

Mental Nut No. 38 Result.

THE three following competitors sent in correct solutions to the above Mental Nut: Mr. E. Banks, 38, Burnside Branch Road, Skipton, Yorks; Mr. J. Adams, 82, Durham Road, Philip Lane, Tottenham, N.17; and Mr. E. L. Tayler, Fern Dene, Old Hall Road, Sale. These readers each receive a book.

Death of Captain Owen Wheeler.

IT is with profound regret that I have to record the death at his home at Strathmore, Princes Road, Weybridge, Surrey, on October 5th, 1932, of our valued photographic expert, Captain Owen Wheeler. Captain Wheeler was a remarkably able man in all branches of photography, and he had during the past two years been working extremely hard on a new system of direct-colour photography, a subject on which he had written many standard works. He was a member of the Royal Photographical Society, and during the War was employed by the Government on photographic research work. Coupled with his expert knowledge of optics and photography was an easy and interesting style of writing, which placed him in the very front rank of photographic authors. All readers of Hobbies who are interested in photography are acquainted with his writings in these pages, and his passing will, I am sure, be keenly regretted by all of my readers. He was a man of great personal charm, and I personally shall miss the pleasant chats we had when he paid his periodic visits to these offices. All readers will join with me in expressing condolences with his bereaved.

Mental Nut Queriists.

WE do not normally enter into correspondence regarding our competitions. Now and again, however, we receive letters from readers who disagree with our solutions. This little corner in Hobbies has proved to be an enormously-popular feature, for each week we receive hundreds of entries. In no case have we made a mistake, either in the presentation of the problem or in the reply to it, which proves that even with the correct solution in front of them many readers are "caught."

Index to Volume 74.

AS noted last week, the semi-annual index for Hobbies, Volume 74, is now ready, and can be obtained for 4d., post free, from the Publisher, Geo. Newnes, Ltd., 8-11, Southampton Street, Strand, W.C.2. Binding cases in red cloth-covered boards, with gilt lettering, complete with title page and index, cost 2s. 9d. from all newsagents, or from us by post for 3s. Even though you do not have your copies bound, an index forms a convenient reference.

NEXT WEEK!

AN AUTOMATIC WARDROBE

HOW COLOURED FILMS ARE MADE

REHAIRING A VIOLIN BOW

THE MANUFACTURE OF PAPER

A MODEL RAILWAY CULVERT

Photography, Stamps, Coins, Electrics, etc.

QUERIES AND REPLIES.

Italian Correspondents Required.

Mr. C. H. Cowings, 38, High Street, South Benwell, Newcastle-on-Tyne, wishes to correspond with an Italian reader with a view to improve their respective languages.

Experimental Wireless Licence.

An experimental licence is now only required by a transmitter. L. V. (Southport). The correct procedure is to write to the Secretary of the General Post Office, asking for the necessary forms of application. On receipt of these you must supply the answers to the questions thereon, return them, and await a reply. Unless you have a good knowledge of wireless and have some considerable experience and can put forward details of serious experiments which you wish to carry out, prospects of obtaining an experimental licence are remote. The amount of the licence depends upon the power to be used, the smallest being 30s. for the first year and 20s. each succeeding year. The licence permits of reception, as well as transmission.

Water Shoes.

An article on "Shoes for Walking on Water" appeared in our issue dated July 9th, 1932, F. V. E. (Teignmouth), and we suggest you obtain this copy. All back issues cost 3d. each.

Making Waterproof Drawing Ink.

The fluid for waterproof drawing inks may be made by boiling 4oz. of shellac and 1oz. of borax in 36oz. of water and then straining it. J. A. (Brixham). Grind the colours with this liquid. For red, use vermilionette or Indian red; and for blue, use indigo. Sufficient colour should be placed in a mortar, a little of the liquid added, and the two thoroughly ground together; more of the liquid may then be added until the mixture is of the proper consistency for working. Transparent coloured inks may be made by dissolving aniline dyes in the liquid. These dyes give a great range of fine colours.

Reducing Cast-Iron to Powder.

Cast-iron borings and turnings cannot be reduced to a fine powder like flour. O. G. (Ipswich). Iron in a finer state of division can, however, be prepared by heating finely-powdered iron ore (red hematite) to a red heat in a current of coal gas. A very fine powder is produced by passing only that which passes through.

Re-covering Old Draught Board.

An old draught board could be re-covered with leather. S. S. (Glasgow), and the squares painted on. Procure a piece of white skiver of the proper size, remove the old cover, and paste the skiver and place it on the board and dry under pressure. Then obtain one penny-worth of green copperas and make a solution. Mark off the board carefully into squares, and paint the alternate squares with the copperas solution, using a camel-hair pencil. The copperas will stain the leather black. Spots or marks made by the copperas cannot be removed, so that the work must be done carefully. Varnish with shellac varnish.

Putty for Crazy China-work.

Take 2lb. of whiting, thoroughly dry it, and pound and sift fine. D. F. (Huntingdon); then add $\frac{1}{4}$lb. of dry white-lead and well mix. Work up to a stiff paste with raw linseed oil, thoroughly incorporating the ingredients. Let the mixture stand a few hours, then work up again and use.

Cementing Fountain-pen.

One of the strongest cements for this class of work, J. B. (Petersfield), is a solution of gelatine in acetic acid. Prepare this by just covering some gelatine in a bottle with strong acetic acid. When the gelatine has swollen, melt down by a gentle heat, and apply at once. Bind the parts together until the cement has set hard. If there is not sufficient surface at the break to hold by, get a silver ferrule made to fit tight over the junction, and apply some of the above cement before forcing it into position.

Printed by Newnes & Pearson Printing Co., Ltd., Exmoor Street, Ladbroke Grove, W.10, and published by George Newnes, Ltd., 8-11, Southampton Street, Strand, W.C.2. Sole Agents for Australia and New Zealand: Gordon & Gotch, Ltd. South Africa: Central News Agency, Ltd.

ALL ADVERTISEMENTS FOR "HOBBIES" should be addressed ADVERTISEMENT DEPARTMENT, GEORGE NEWNES, LTD., 8-11, SOUTHAMPTON STREET, STRAND, W.C.2. Telephone: TEMPLE BAR 7760.

Make these as presents for Christmas!

1933 CALENDARS

A novel and delightful present any owner of a fretsaw can make. The pictures are printed in colours and ready to stick on a piece of wood to be cut out. Can be done for a few pence in a few minutes. A fascinating pastime which saves money. The pictures stand with supports behind, and have a dainty 1933 calendar for each month on the front. Two of the subjects are for indicating trumps also, with a movable hand. Thousands are made up every Christmas.

No. 5018.—Dates Am Good. 2d. each, 1/9 doz. Calendar 6165 1d.

The long pictures measure about 6¾in. by 4in., the upright ones are 4in. wide and 7in. high. Postage is ½d. extra on pictures alone, 1½d. if date-pads are included.

No. 5003.—That's torn it! 2d. each, 1/9 doz. Calendars 1½d. each.

No. 5013.—All Out! 2d. each, 1/9 doz. Calendars 1d. each, 9d. doz.

A FULL RANGE OF SUBJECTS IS GIVEN IN HOBBIES CATALOGUE. OR FREE ILLUSTRATED LISTS ON REQUEST.

No. 5015.—Family Ties. 1½d. each, 1/3 doz. Cal. 2d.

No. 5017.—Moonlight Fancies, 1½d. each, 1/3 doz. Cal. 1½d.

No. 5002. An a -weather court. 2d. each, 1/9 doz. Calendars 1d.

Obtainable through most stores and ironmongers. Or from Hobbies own branches in London, Glasgow, Manchester, Birmingham, Sheffield, Leeds, Brighton, Southampton. By post direct from Hobbies Ltd., Dereham, Norfolk.