

Hobbies

WEEKLY

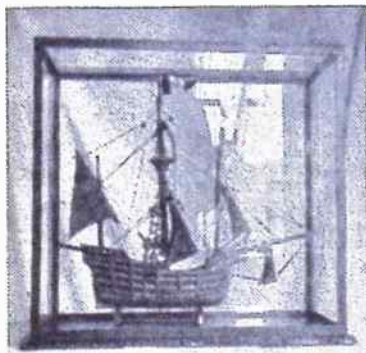
TAPE
RECORDING
ACCESSORIES
See page 410

VOL. 114

NUMBER 2969

Keep out the dust—build

A GLASS CASE FOR YOUR MODEL



DUST is the enemy of all fine work and is only too apt to settle on model galleons, etc. The worst of the dust can always be sucked off or blown off with the domestic vacuum cleaner, the nozzle being held as close to the model as possible, whilst one can use a short tube, like a pea shooter, to blow away dust in awkward crevices. To a certain extent, a thin coating of grime gives a patina that well suits old time ship models, but this can very easily be overdone, whilst for other models, a clean appearance is usually needed. Glass cases are also needed in other hobbies—for those who practice taxidermy or animal stuffing, for example.

Glass covers are very expensive to buy, whilst if one uses narrow section wooden or metal channelling (not easily obtained by the amateur), special skill is required for the corner joints. By using

passee-partout binding, however, quite a strong and attractive case can be made as can be seen by reference to the accompanying photograph. No special skill is required unless it be in the cutting of the glass (the amateur will possibly get this done for him). The glass *must* be cut *accurately* to size. In the sketch the thickness of the glass has been purposely exaggerated, but the diagram shows how the sides butt against each other. The top must be *exactly* the size of *a, b, c, d*, otherwise unsightly bulges will occur. It may be better to order the top piece of glass after the four sides have been assembled and measured. The glass must also be cut with square, smooth edges. Before

ordering *any* glass, make quite sure that the case, when made, will suit the model.

Assembly

Assembly is best done on a flat surface—a drawing board is excellent. As the photo shows, four pairs of wooden blocks are used to hold up the glass sides whilst they are being joined together. The blocks (size almost immaterial) are lightly nailed to the wooden (temporary) base board and spaced the thickness of the glass apart.

The piece of wood seen across the top of the photograph serves, first, to ensure that all tops are level. Secondly, if a weight is laid on the wood (taking care that it does not topple off and break the glass), it serves to hold the glass together well at the top.

Black *passee-partout* binding is used and can be obtained at practically any stationer's shop. Some kinds are already creased down the centre. If this is not done, cut off a length and then crease it neatly. Practically all *passee-partout* binding is now ready gummed. It is dabbed with a wet sponge, care being taken not to have the sponge too wet or wipe too hard, which will take off the gum. Apply one half of the strip to one piece of glass, taking great care that it is straight all the way (the fold in the

IN THIS ISSUE

	Page
A Glass Case for your Model	401
Designing and Building Model Railways	403
A Modern Style Magazine Rack	404
Radio Transmitting and Model Control	405
'Heraldic' Trinket Box	406
Making a Stuffed Box Seat	407
How You Can Make Your Photography a Winter-Time Interest	408
Tape Recording Accessories and Refinements	410
Planning your Firework Night	411
A Useful Casket	412
How to Prevent Rust on Tools	412
Replies of Interest	414

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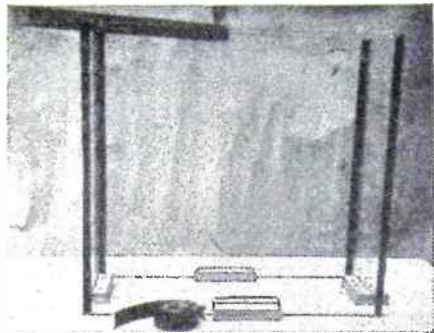
THE MAGAZINE FOR MODELLERS,
HANDYMEN AND HOME CRAFTSMEN

World Radio History

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PAGE 401

binding coming against the angle of the glasses). Then press down the other half, smoothing with a clean dry duster.

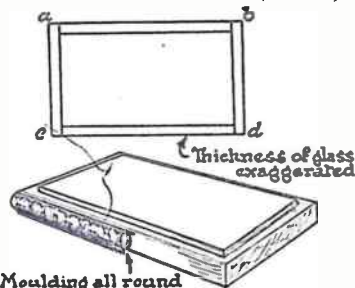


Treat all four corners in turn and then apply the top piece of glass. All the surfaces of the glass to come inside the case should be well cleaned before assembly. A pasty mixture of whiting and weak ammonia is as good as anything for this purpose.

The 'raw' bottom edges of the glass should also be bound round with the *passee-partout* binding. The whole job is now quite strong, but the maker will look at it from time to time to ensure that the *passee-partout* has not started peeling away, as may possibly happen if the job is left in a damp spot or a hot one. Indeed, there will usually be plenty of opportunities for looking at it, as it is not the writer's intention that models be kept permanently under glass. This tends to give them a 'museum' look. But the glass case can be put over when the room is not in immediate use and taken off when the room is in use and company are expected. Most models of the kind in question are usually kept in the best room.

A wooden base is needed. This is very easy to make, being just two slabs of wood joined together, the inner one being a trifle smaller than the inside opening of the glass case, and the outer

one about $\frac{1}{4}$ in. wider all round. The edges of this lower slab are hidden with suitable moulding tacked and glued on. The top piece need be only $\frac{1}{4}$ in. or so thick—enough to prevent the cover sliding off. The lower piece is thicker and it would be as well to suit this thickness to the moulding you have rather, in these times, to look around for moulding to suit the thickness of the base. (W.A.B.)



This sketch, and the photograph opposite, explain construction and assembly

Radio Transmitting and Model Control

(Continued from page 405)

half to port; 5, full astern; 6, reverse, half to starboard; 7, ahead, full to starboard; 8, ahead, half to starboard.

With such a mechanism the sequence provided can only be obtained in the same order. But in practice this is not very important, since it is possible to snap almost instantly through the undesired control positions. For example, full ahead can be changed to straight astern in a second or so by four rapid impulses in succession.

A rotating arm such as that in Fig. 4 could also be driven by a second small electric motor, controlled by the relay in Fig. 1. The rudder and switch arm can then be brought to rest in any position.

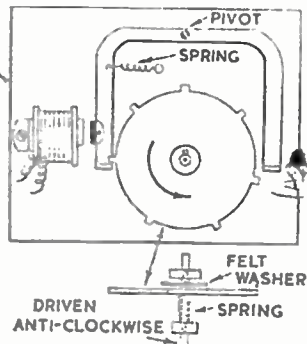


Fig. 3—A mechanism operated from the driving motor

Using Extra Channels

The foregoing mechanisms are employed to enable a good degree of control to be obtained with only one radio signal. When the simultaneous control of various units is necessary, independent of each other, other systems must be used. One method is to use two or more transmitters, operating on different wavelengths, and to use two or more receivers in the model. This increases expense and size considerably. Another method is to arrange so that the radio signal carries a modulation tone, which can be selected by a suitable filter circuit in the receiver. Only one transmitter and receiver are then necessary, but these are somewhat more complicated. In view of this, it is best to keep the number of movements in the model down, and to make use of mechanisms such as those described, as much as possible.

In future articles various circuits will be given, employing battery-operated transmitters and receivers. A model boat of fair size is, in general, the best to deal with and quite low power will enable it to be navigated within a radius of 50 yds. or so. Runabout mechanisms to travel over land are also feasible,

of course. In the event of the model being kept within one room, even lower power will be sufficient. The range over which control can be maintained depends largely upon the number of valves in the transmitter and receiver, but it is usually possible to add an extra valve or two subsequently, if required. (F.G.R.)

Part III of this series, due soon, describes the making of a first-class transmitter.

Model Coal

When you have been fretsawing there are a number of small pieces of wood when you have finished. You can use these pieces by putting them in black paint with a little varnish mixed together. Get them out and put them in a box to dry. They make realistic coal for model railways.

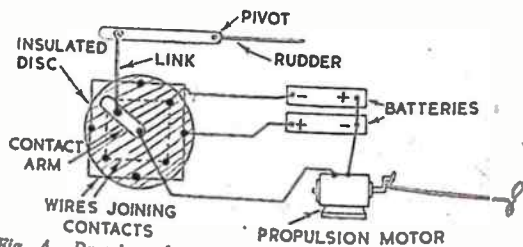


Fig. 4—Drawing showing layout of a switching mechanism

New Series—No. 15

DESIGNING AND BUILDING MODEL RAILWAYS

By E. F. Carter

Better Running

The fitting of die-cast or turned steel wheels instead of pressed-steel ones has already been mentioned, but it should be remembered that the change is not suggested purely on the grounds of appearance, for with new wheels any given engine will haul almost double the load (or with clockwork engines, the same load for double the distance) when solid wheels with correctly-profiled flanges are fitted to all the vehicles in the train. In some cases, when refitting wheels it may be found necessary to slightly reduce the lengths of the axles, but this is a simple job to be carried out with the aid of a smooth file and a metal cutting saw. The axle ends should be carefully rounded off and smoothed to reduce friction. Only very little thin oil should be used as lubricant, this being applied with the sharpened end of a match to the actual bearing, taking care that none is allowed to get on to the wheel treads, where it will do more harm than good!

Variety is the spice—of a local passenger train. It must not be assumed that every vehicle in such a train should be a 'new' one. An 'old' coach is often to be seen on the real railways sandwiched between spotlessly-clean ones, and the same realistic effect should be produced on a model railway.

Quite old model coaches can often be brought into useful service by picking off the old tin-printing as already explained in article No. 14, after which alterations and additions can be made previously to re-painting in a not-too-brilliant style. All items not made of

(Continued on page 404)

THERE are not a great many improvements which can be made to commercial tin-plate passenger coaching-stock, for the material of which they are made does not readily lend itself to additions and alterations without showing signs of damage. There are, however, many measurements and details which will often be found wrong on such coaches which can be rectified without 'hacking' the whole coach body to pieces.

Buffer-height Wrong

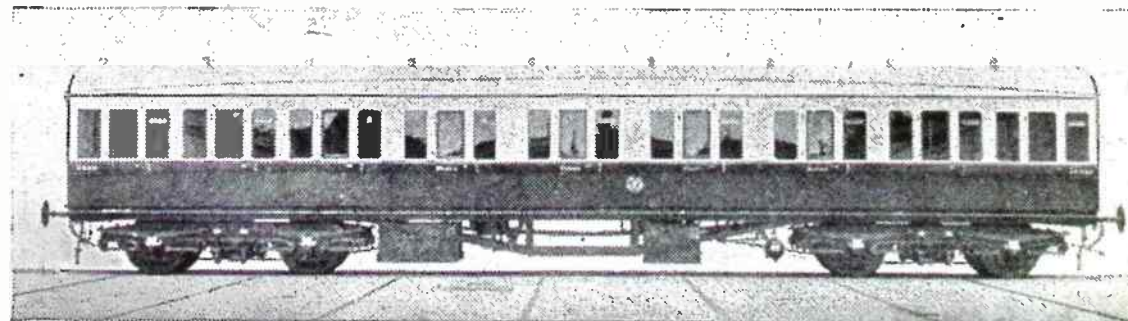
More often than not, it will be found that the buffer-height is all wrong, being anything up to $\frac{1}{4}$ in. on the high side. This error does not make for easy and safe running should such a vehicle be marshalled in a train with buffers at the correct height. The error can be corrected in two ways, viz. by removal of the washers between the bogie-frame and the coach floor, and by fitting slightly smaller diameter wheels. If solid wheels are to take the place of pressed steel ones—which are not very satisfactory in running—then the two troubles can be cured at once.

It will also be found that the fitting of oval-headed buffers and scale three-link couplings will both add to the realism and running qualities of most vehicles. Roof guttering is another detail which can be 'fitted' easily to a tinplate coach by simulating a raised gutter by merely painting a $\frac{1}{4}$ in. wide black line along the lower edge of the roof. (This line should be brown on Great Western stock). The curved roof rain-strips can also be applied by steeping thin twine in 'Seccotine' or other tube adhesive and working it whilst 'tacky' into a sweeping curve along the lower edges of the roof, which should have been previously slightly roughened by scraping off some of the tin-printing.

Destination boards can also be fitted to the roof, these being made about 2 ins. long by $\frac{1}{4}$ in. wide for 'O' gauge; thin card is the material used. Coach accumulator boxes in the same scale can be made from small wooden blocks 2 ins. long by $\frac{1}{4}$ in. deep, by $\frac{1}{4}$ in. thick, these being stuck with 'Bostick' to the floor of the vehicle centrally between its bogies. Care should be taken to ensure that the lower edge of the boxes do not hang nearer than $\frac{1}{4}$ in. from the running rails, and that they clear the 'live' rail if the latter is centred between the running ones. Roof ventilators are both cheaply purchased and easily fitted, L.M.S. type also suiting Southern stock, and the Great Western 'shell' type being used for that railway's vehicles. The original overscale atrocities usually fitted should first be snipped off and removed before fixing the new ones in place with solder or 'Bostick'—which latter adhesive is quite satisfactory for the purpose.

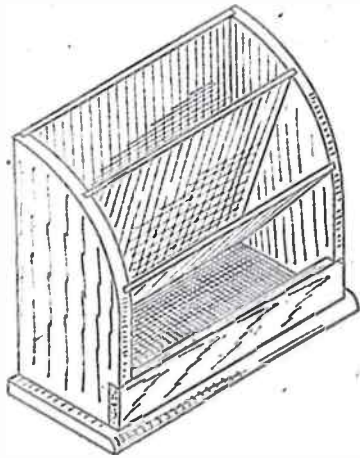
Bogie Spacing

Apart from the addition of sundry details to the outsides of coaches, a great deal of improvement and variety can often be made by slightly altering the arrangement and spacing of the bogies, which latter are frequently placed much too closely together in commercially-built stock. The distance from the bogie pivot-pin to the face of the buffers should be approximately equal to the wheel-base of the bogie, and if the bogies are moved into this position a much more well-balanced appearance will be given to the vehicle.



Great Western Railway non-corridor composite coach No. 6592

Photo: Courtesy British Railways



One-Evening Project: A Modern Style Magazine Rack

these lines cut a groove $\frac{1}{8}$ in. wide and $\frac{1}{8}$ in. deep. The edges of these grooves can be sawn and material removed with a $\frac{3}{8}$ in. chisel quite easily although some woodworkers prefer to use a sharp knife for edging cuts on cross grain material. A rebate is cut on the back (vertical) edges to accommodate the $\frac{1}{8}$ in. thick back, this rebate also being $\frac{1}{8}$ in. wide.

The Back

The back can be cut from $\frac{1}{4}$ in. ply or hardboard. It must be truly square and accurately dimensioned. This, the two ends and the front strip are assembled with glue and pins, again checking for squareness when completed. Make sure that excess glue does not flow into the grooves in the sides and block them. It goes almost without saying that the grooves are on the inside of each end,

i.e. the ends are of opposite hand.

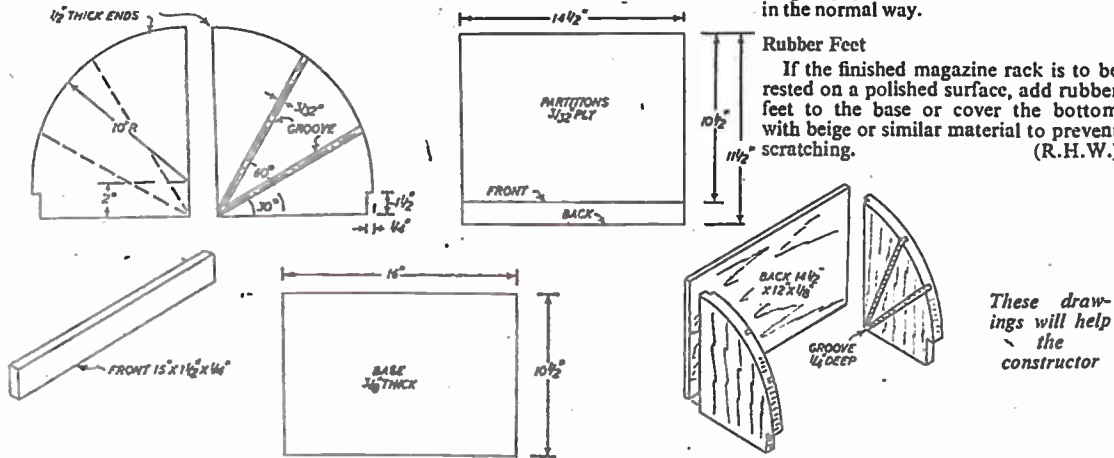
When set, the assembly should be mounted on the base. Again pinning can be used to reinforce the glued joints. Additional corner blocks can be used for greater strength, if desired. The rear edge of the base lines up with the bottom of the main assembly, leaving an overhang at the front and the two ends. Round off the front edge of the base for improved appearance.

The partitions are cut from $\frac{3}{4}$ in. thick ply to the dimensions given. Again these must be cut truly square. Before cutting check the actual width dimensions between the slots as a precaution. The partitions should be slid in place and glued for a permanent assembly, after first staining. Any wood standing proud of the ends is then trimmed off when the whole project may be glasspapered and the wood finished in the normal way.

Rubber Feet

If the finished magazine rack is to be rested on a polished surface, add rubber feet to the base or cover the bottom with beige or similar material to prevent scratching. (R.H.W.)

ONE evening's work should see this modern magazine rack completed, if not finished and polished. Construction is straightforward but all parts must be cut accurately. Start by cutting the two ends from $\frac{1}{4}$ in. thick material. Lay out to the dimensions given and mark 30 degree and 60 degree lines, as indicated. Along



Designing and Building Model Railways

(Continued from page 403)

metal must be removed from the body before pickling commences, otherwise they will be destroyed.

There are many other ideas which can be brought into practice, such as turning non-corridor stock into corridor by fretting out the adjacent compartment windows, and by afterwards

repainting the coach to improve its individuality and so brighten up the general appearance of the train in which it is included; thereby improving the 'look' of the whole layout in a very subtle way.

It may not be generally known that coach and 'Pullman' interior fittings—

tables, seats and partitions—made of very fine-grained wood are not available on the market, being purchasable at most model stores at ridiculously cheap prices. With a small stock of these essentials and a tube of 'Bostick' it is easily possible for the rawest amateur to internally fit his coaches or 'Pullmans' with perfect accuracy in either 'O' or 'OO' scale. Whole wooden bodies are also obtainable in kit form.

PART II—CONTROL MECHANISMS

Radio Transmitting and Model Control

BEFORE going on to actual circuits for transmitters and receivers suitable for model control purposes, details of the control mechanisms themselves may with advantage be considered. A great variety of such mechanisms can be made up, or devised from existing materials, and some may be very simple, while others are more complicated and ingenious. As a rule, the more complicated mechanisms enable the model to be controlled in additional ways. For example, the simplest form of control for a model boat would consist of steering. To this might be added a means of controlling the speed of the motor, and provision for stopping and reversing it.

Relay Used

The signal picked up by the receiver in the model is not sufficiently powerful to operate any but the very lightest mechanism, and is normally used to operate a relay similar to that shown in Fig. 1. The bobbin is wound with many turns of wire, and the armature pivots freely on a knife-edge. When the bobbin is energised by the current flowing to the

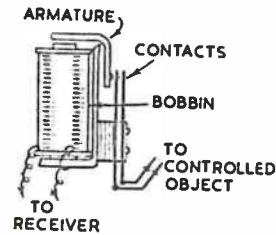


Fig. 1—Type of relay used for control

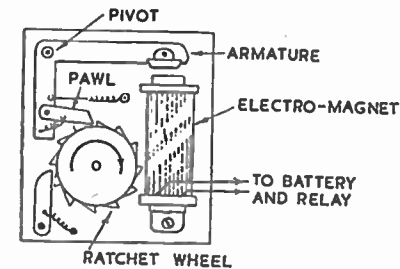


Fig. 2—A simple operating mechanism

may be arranged to close more easily, if this is necessary.

If a relay is to be made, a bobbin about 1 1/2 ins. long and 1/2 in. in diameter, with a soft iron core 1/2 in. in diameter, wound to capacity with 40 S.W.G. enamelled wire, can be used. Careful construction is essential, and the gap between armature and magnet must be as small as possible. The relay can be tested with a battery, variable resistor, and meter, to determine the current required to close the contacts.

For steering a model the leads from the contacts could be taken to a battery and small motor, the latter operating the rudder through reduction gearing and a crank.

A Ratchet Mechanism

Fig. 2 shows a mechanism which it is possible to make up. The electro-magnet is energised by means of a battery, one lead being taken to the

disc is free upon the axle, but constantly endeavouring to rotate in an anti-clockwise direction because the axle itself is turning in this way. (It may be driven by reduction gearing from the motor used to drive the model along). Every time the magnet is energised the disc rotates one tooth. This can operate the rudder, etc., as already described.

An alternative is to use a clockwork motor with the toothed disc secured to the spindle. The clockwork motor will then turn the disc a tooth at a time when the magnet is energised.

Small magnets for this mechanism, and that in Fig. 2, may be made by winding bobbins about 1/2 in. in diameter by 1 in. long full with 22 S.W.G. wire. All the mechanisms should operate as freely as possible, and the armature must be of iron, or have an iron piece for the magnet to attract.

Switching Mechanisms

It should now be considered in more detail exactly what may be accomplished by having a wheel which can be allowed to rotate or stopped at will, as just described.

The mechanism in Fig. 4 consists of two elements combined, and that operating the rudder can be considered first. The arm is secured to the axle driven by a clockwork motor as explained; the toothed disc should have eight teeth, in this case. As the magnet in Fig. 3 is energised, it will be possible to halt the disc in any of eight positions. These would control the rudder as follows:—Position 1, straight ahead; 2, half to port; 3, full to port; 4, half to port; 5, straight ahead; 6, half to starboard; 7, full to starboard; 8, half to starboard. The sequence then begins again. By this means the model can be steered.

At the same time the rotating arm contacts round-headed bolts set in an insulated disc. These provide for forward motion of the model in one position, and backwards motion in the other. If an 'Off' position is required, then nine contacts can be used, with a disc with nine teeth, and one contact left disconnected. The motor must be a permanent magnet one, or it will not reverse when polarity is reversed.

Additional Movements

The method of operation will depend upon how the contacts are wired. The following is suggested:—Position 1, straight ahead; 2, ahead, half to port; 3, ahead, full to port; 4, reverse,

receiver upon the radio signal being received, then the armature is drawn down and the contacts closed. The latter are wired to complete the electrical circuit to the motor or other controlled object.

The relay must be of the type intended for this purpose, and should close with an extremely small current. A sensitive can be adjusted to close with only 3 or 4 milliamps current. If the relay does not operate, neither will any of the radio controlled mechanisms, and it is as well to purchase this component ready made. Some ex-service relays are suitable. The current required to close the relay used can be measured with a meter, which will in any case be required when setting up the transmitter. By careful bending the contacts

relay contacts. Every time the relay contacts close and open, the armature is attracted to the magnet and released. The spring attached to the L-shaped arm accordingly turns the ratchet wheel one tooth.

The rotation of the wheel can carry out useful actions, such as moving the rudder through a crank and link, or turning a contact arm similar to that shown in Fig. 4. It can also open and close various switches in sequence, by means of small cams, and so on.

A Power-Driven Selector

A somewhat similar mechanism is shown in Fig. 3, but this has the advantage that power for rotation is derived from a motor, not from the small tension spring in Fig. 2. The toothed

(Continued on page 402)

The Fretworker can make an 'HERALDIC' TRINKET BOX

A full-size pattern (Fig. 1) is given which is easily adapted to the different parts.

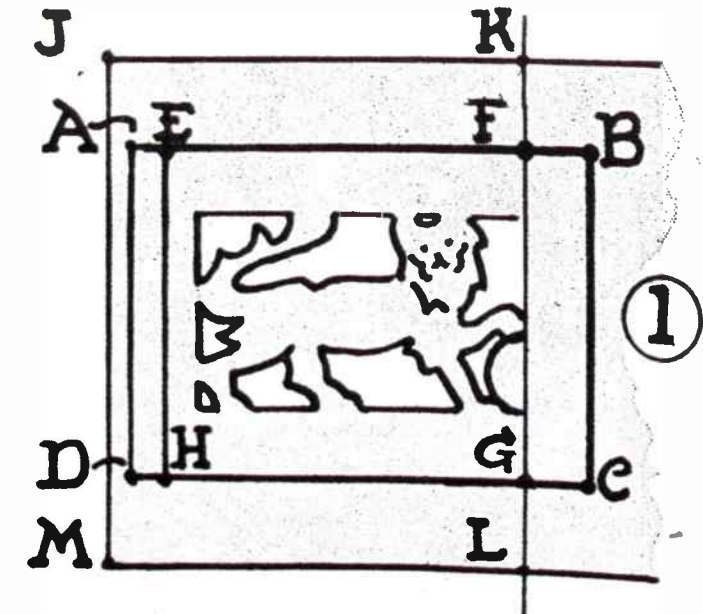
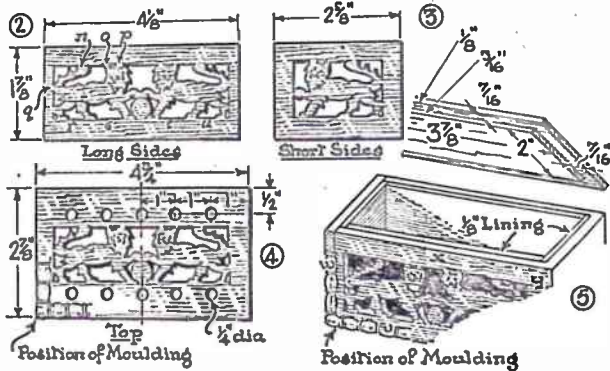
For the short sides (Fig. 3) trace off (A, B, C, D). It is immaterial which way the lion faces, and optional whether you show the half ball.

For the long sides (Fig. 2). On a piece of tracing (transparent) paper, trace off (E, F, G, H). Trace this down on to the left-hand side of a sheet of plain paper. Now turn the tracing over, and fitting line (F, G) against the centre line, trace



THIS little trinket box as will be seen from the photograph, has a quaint old-English look about it, with its 'carved' (actually fretted) heraldic lions on the sides and top. When made up it measures 4 1/2 ins. by 2 1/2 ins. by 2 ins. and is thus suitable for holding collar studs, hair pins and the like. It can, however, easily be made twice the size and used for handkerchiefs, gloves and similar articles.

Plywood is quite unsuited to this job. Oak is the best and most appropriate, though other hardwoods will serve. The whole job can be done in 3/8 in. wood, but, for preference, some is done, as will be indicated, in 1/2 in. material, and other parts in 1/4 in. stuff.



Full-size details of the heraldic lions

off a reverse drawing. Fig. 2 will make this clear and the printed dimensions will act as a check.

For the top (Fig. 4). Trace to lines (J, K, L, M) and then reverse, as described above. The positions for the holes can be marked off afterwards. If desired, the top of the box can be left unfretted and a simple oak diamond or button glued on.

The patterns being traced down to the wood, a start is made by drilling holes with a fretwork drill for the lions' eyes and other holes, as small as possible, so that the inverted Y-shaped nose and the S-shaped marks at the cheeks can be cut. Careful work is needed here. The holes in the lid part can also be drilled before other cutting is done. The

general cutting is straightforward. Note that at such places as (n, o, p, q), the lion is attached to the main surround. Take care to keep sections (r, s, t, u) for example, all in one straight line. The four sides are cut in 1/8 in. material and the top is cut in 1/4 in. stuff.

Fig. 5 shows how the parts are glued and tacked together, with lining strips glued inside. Take care to wipe off any glue that oozes out. Half-round moulding, about 1/4 in. wide of the type shown, will hide the raw edges of wood.

The lid is in two parts, the fretted top, as already described, cut in 1/4 in. wood, and a 1/4 in. underlid as shown in Fig. 5, glued on. Test this underlid for size, first, before gluing on. It should rest snugly inside the box.

In dimensioning the lid, the writer has allowed for it to overhang an 1/4 in. thickness of moulding on the sides. If the moulding is thicker than this, extra allowance must be made on the lid. Moulding too thick, however, will look clumsy. In Fig. 5, the moulding goes not only where shown (v, w) but also on sides (x, y). A bottom (not shown in the drawings), a trifle larger than the underlid and about 1/4 in. thick is added to the bottom. The exact size had best be taken from the actual job. A piece of green baize glued over the bottom makes a neat finish. (W.A.B.)

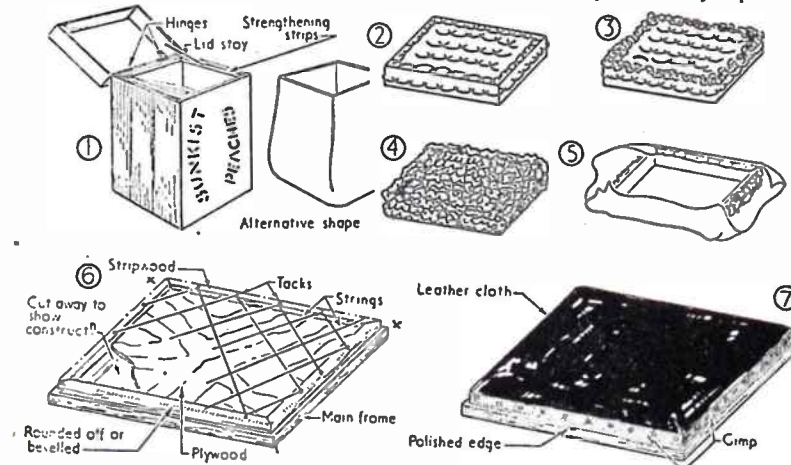
FOR HOME CRAFTSMEN

Making a Stuffed Box Seat

THIS article serves a double purpose: firstly to conclude from last week's article, the instructions for making a music stool by describing how to upholster the seat, and secondly how to apply the same principles to making an attractive 'stuffed box' seat.

The Stool Lid

To start with the music stool lid: Fig. 6 shows the lid framework with some thin twine criss-crossed over it, being secured to the stripwood surround with 'tin' tacks. The diagram purposely shows the strings arranged a trifle irregularly so as to hint that no great exactitude is needed here, though it is probably just as easy to arrange the strings regularly. Do not have them too tight, nor too many.



Under these strings place the stuffing. Horsehair is, perhaps, best. Flock is good. New material has more 'life' in it but, especially in these hard times, stuffing taken from old furniture (if clean) can be used. Tease out any hard lumps. The purpose of the strings is to keep the stuffing in place. Build up an even flat dome-shaped mass.

To x-x (the rear stripwood), tack a piece of unbleached calico (or similar material), the warp thread running from the front to the back of the lid. This is brought down over the stuffing and finally tacked down on all sides, the edges and corners being neatly turned in and surplus material trimmed off. For a

super job, it is an advantage to lay a sheet or two of wadding over the top, and if one splits the wadding sheets so that fluffy sides are outwards, they will not slip. Unless, the wadding is added there is a risk of the strings showing through the top.

The final top is then added, being tacked on as before, first at the back, then at the centres of the sides, and the corners left until last. The choice of material for the top will chiefly depend

on the type of furniture the stool is to match. There is quite a choice of materials, as a visit to an upholstery-dealers will show.

The raw edges are now hidden with 'gimp' which is a tapé-keli strip made in many patterns and materials to match ones top material (or, if desired, to form a contrast with it). It is held with special ornamental gimp pins (Fig. 7).

Same Principles

The same principles of padded seating can be applied to the making of a simple padded-top stool or box, as shown in the illustration. This time, instead of having a nicely-jointed piece

of work as in the music stool, we have a rough box—a soap or margarine box, maybe—partly knocked apart and then reconstructed (and strengthened, incidentally) to suit the size required. If for a low stool, the box need measure only about 18 ins. by 12 ins. and 12 ins. high including the lid (say, 8 ins. high box and 4 ins. lid). For a slipper box about 15 ins. each way would be quite suitable. If required for a dressing-stool, it will be about 16 ins. or so high. There is no compulsion to make a hinged top, but it is very worth while doing so, as the storage space thus afforded is much appreciated in the average home.

Fig. 1 shows the carcass of a typical seat. For purposes of illustration, the lid is shown already hinged and supported with a lid stay, but, in practice, the lid is hinged after the stuffing has been done. Normally only the lid is stuffed. One starts by covering it with calico, tacking this on, and then, with fine twine and a packing needle, sewing a series of overlapping loops known as 'bridles'. See that the corners and edges are well served with loops. Flock or similar material is placed evenly under the bridles (Fig. 3), starting with the edges (Fig. 2). Very little padding is required at the sides. The padding is then covered with calico, as shown in Fig. 5.

It is not at all necessary to stuff the sides of the main box unless a special shape such as that shown in Fig. 1A is required. Take care not to get any stuffing or undue thickness of material along the under edge of the lid (where it rests on the box top), as otherwise there will be difficulty in hinging, and an unsightly gap in addition.



Good Covering

Cretonne is a good material with which to cover the box and lid, other suitable materials being linen, tapestry, moquette and velvet, these being strong enough to stand the strain of stretching. Other materials may split. It is a good

(Continued on page 414)

How You Can Make Your Photography a Winter-Time Interest

NOW that the holiday season has practically come to an end, and the majority of us are back at our normal and everyday duties, the happy moments and jolly incidents of our fortnight's stay at the seaside, or in the lovely countryside, have become, to many of us, memories of the past, and are only recalled when a friend asks us where we went for our holiday.

Have you noticed how, sometimes, such questions as these give you quite a

your collection. On the other hand, you may be one of the large number of folk who make only a dozen or two shots because you use the camera only when on holiday.

Well, anyway, it is not so much a question of how many clicks were made, but rather: what are you going to do with the resulting prints?

If these are worth keeping because you like showing them, and they are a record of a good time, then surely a

now have a number of loose leaves ready for a binder, and this can be provided as follows. Get two pieces of stout cardboard 12ins. by 10ins. and cut a strip about 1½ins. wide from one of the 10in. edges of each piece. Then in these two strips punch a couple of holes to coincide exactly with those in the brown paper sheets. These strips have now to be joined up to the main pieces of cardboard to form hinges and this is done by means of gummed linen tape, which can be bought at any stationers. In making the hinge, leave a space of about ½in. between the strip and the card and bind on both sides. You now have covers and inside sheets, and to complete the work it is necessary to obtain, again from the stationers, a brass pillar complete with top screw, as used for the regular loose-leaf files and office books. The covers can finally be bound with the same colour of brown paper, or any other to suit the taste.

In practice I would advise you to make use of only one surface of the brown paper sheets and to reserve the surface facing the prints for a carefully written record of the events or places illustrated on that page.

Use Gummed Corners

For inserting the prints I find the use of gummed corners very useful, indeed, as they are clean and easily applied, and the prints can be quickly removed if required at any time in the future.

With such an album all your prints will keep in good condition indefinitely, and will be a source of enjoyment and an aid to memory. Further, you will be wise to prepare, while you are about it, an extra number of sheets for the prints resulting from future holidays, because these can be quickly added, as it is now a loose-leaf album and capable of holding an indefinite number. But be sure to write the date of the year on the first sheet of each section.

To those who have returned with only a small number of prints, it should be realised that this idea can be just as effective—even with only one spool of film. The covers and sheets of the album can be made smaller, if desired.

Another hint which will be of interest to many, as it concerns all who have used a camera on holidays, is the selecting of one or more of the photographs for enlarging. The author has for many years picked out the most pictorial of his holiday results and made enlargements up to 12ins. by 8ins. or even 15ins. by 10ins. Then, mounted and framed, these are given a place on one of

the walls of the home where they serve as a constant reminder of some happy time or of an interesting place visited. It is really surprising the amount of pleasure they give not only to my family but also to friends.

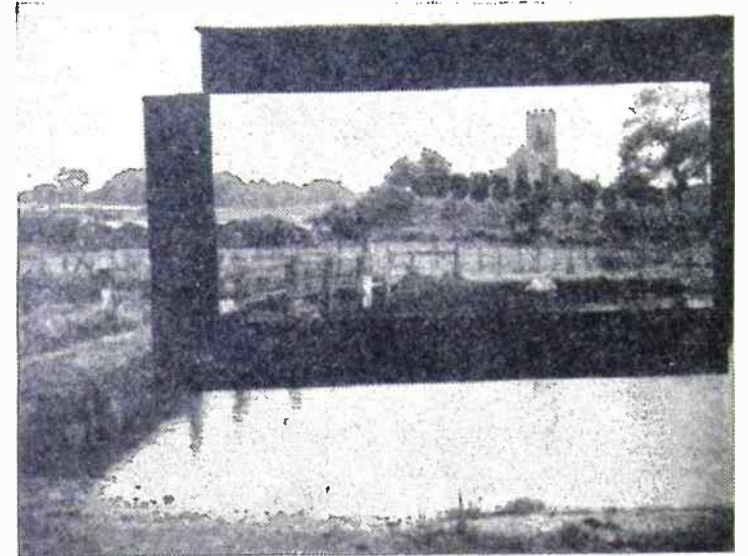
It may be that you are not in a position to make such large prints yourself, but most photographic dealers have the means to accommodate your requirements. Before taking the negatives to the dealer, however, it is advisable that you should carefully examine each one.

Good Negatives Needed

Only a really good negative can give a perfect enlargement. If there are spots or scratches, then, obviously, those blemishes will be enlarged. There may also be one or two details on the extreme edges which were, unavoidably, included when the exposure was made. But these can possibly be cut out when the enlargement is being made. Then there is the question of composition, and this is quite an important point. You can get a lot of help by cutting two small angle pieces, as per the illustration, out of black paper and using them on the print in question for finding the best part of the picture, or which section of it makes the real picture. Remember, it is *not* necessary to enlarge the whole negative and then to trim away that which is not wanted. So decide beforehand, and rule with pencil lines the exact portion wanted. And explain what you want to the dealer.

When the enlargement is received do not delay the mounting, and remember that the top margin of the mount should be either equal to or half as wide again as the side margins, and the bottom at least twice that of the sides. Do not use coloured card for mounts. The modern style demands white without any lines or other embellishment. If your handwriting is good enough and the picture demands a title on the left-hand bottom corner, use pencil for it.

Why not use some of your holiday snaps for Christmas cards and calendar's? It is a very interesting job, and also an economical way of making your gifts. A full sized sheet of white card measures about 22ins. by 20ins. and costs round about 1/6. For small prints it would cut easily a couple of dozen mounts. If calendars are intended, then small ones quite suitable for small prints can be purchased at 1/6 or 2/- per dozen. For several years I have made use of prints 8½ins. by 6½ins. and mounted them as suggested with



How the unwanted parts of a photograph are marked off before an enlargement is made

attractive calendars and dispatched about three dozen to my friends, who always seem to appreciate and retain them.

Competitions

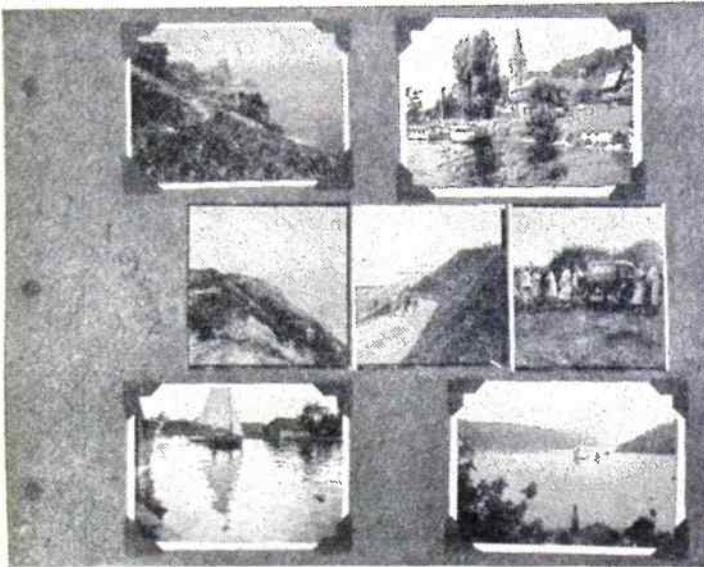
Possibly the best hint with which to finish this article is to again advise you to consider entering some of your work in one of the many competitions which are being run by manufacturers of photographic apparatus and materials, or by newspapers and corporations. It is excellent fun and very good practice, for, obviously, you send in only your best work and this is exceedingly good for you. So carefully study your negatives and prints, pick out the most attractive, and have a shot. You may not win a prize, but you will have made an effort which will have an effect of great advantage on all your future work.

This is the time of the year when all camera clubs and photographic societies are renewing their activities, or commencing their winter programmes of lectures and demonstrations. There is almost certain to be such a club in your neighbourhood, and you will find it valuable, indeed, to become a member. The fees are usually low, generally only a few shillings, but the amount of practical knowledge of the hobby that can be gained from the meetings is

truly remarkable, especially to one who is really keen on improving his work or getting beyond the 'press the button' stage. Most of the well established societies have finely equipped dark-rooms for the use of their members, which means that there is the opportunity for you to do your own developing and printing, also to make your own enlargements and lantern slides; in fact, to make a real amateur photographer of yourself. Further, lectures and practical demonstrations are always given by experienced members and frequently by experts in some particular branch of the art.

If you are living in a district where there is no such club, why not start one? It is quite simple. Possibly there is a youth organisation of some sort, or a scout troop, or, perhaps, you know a few folk who have cameras. Well, get together, and get each one to agree to buy a piece of apparatus, until all the necessary initial materials are obtained. A small subscription could be allowed to accumulate until replacements are wanted or when a more expensive piece of apparatus would be desirable.

Finding a meeting place may at first prove somewhat of a snag. If it is not possible to get accommodation at the house of a member, approach the Vicar for use of the parish hall. (J.J.C.)



A page of a home-made photograph album

thrill. In fact, you really get a lot of enjoyment discussing that holiday over again, for it enables you to recall some of the happy events and, if you are an amateur photographer, you will illustrate the conversation by showing your friend some of the 'snaps' you succeeded in taking.

Prints are Valuable

What about those 'snaps'? If they are the means of reviving your memory of a few days spent in a relaxing atmosphere, free from work and worry and full of the desire to enjoy to the fullest every minute, then those prints are really valuable and worthy of some consideration.

If you are a keen amateur you have probably exposed six or eight spools, or even more, and have added, perhaps, four or five dozen good negatives to

little care should be given them? They should not be kept in a pocket or bag until their edges get frayed, and greasy finger marks appear on the surfaces. There are many small albums, costing only a few pence, in which they can be stored and retain their newness for years.

Talking of albums reminds me of one of the hints that I wish to put up to you in this article. It is an easy and interesting job making your own album—an album that is not only for storing photographs but also for writing a record of the holiday during which the snaps were made.

I will deal first with a collection of prints, say, three or four dozen. Cut a number of sheets of fairly stiff brown paper, size about 10ins. by 8ins. About ½in. in from the 8in. edge, punch two holes each about 1½ins. in from the 10in. edges. You will recognise that you

For the Enthusiast—

TAPE RECORDING ACCESSORIES

MANY readers will have built their own tape recorders and be experimenting with this fascinating method of sound recording. No doubt they will be interested in details of some refinements and additions to their apparatus to enable them to obtain the best results.

AND REFINEMENTS

shows a circuit suitable for use with low impedance heads. The meter is of the 0—0.5 or 0—1mA FSD moving coil type, which may be obtained as ex-government surplus. A small copper-oxide or selenium rectifier is required, of the kind normally used with A.C. meters. The 100K variable potentiometer is adjusted so that the meter needle is deflected half way across the scale at the correct recording volume. This, of course, must be determined by experiment.

Cheaper Method

A neon tube provides a cheaper method of indication. The circuit is given in Fig. 3. Adjust the 250K potentiometer so that the neon just flashes on the strongest signals permissible without distortion.

Sometimes the metal in the recording head becomes slightly magnetised because of the friction of the tape. This considerably impairs the quality of the output. Ground noise becomes troublesome, and the tone fuzzy and distorted. The head must be de-magnetised, and

ordinary amplifier will give disappointing results. A certain amount of frequency correction must be applied during recording and playback. The typical uncompensated response curve of the tape shown in Fig. 5 makes the reason clear. It will be seen that a large amount of bass boost and a sharp lift in the treble is needed to give the ideal straight line response. An amplifier for tape recording, then, must incorporate

Audio Feedback

When recording from a microphone, it is difficult to avoid audio feedback. This is characterised by a violent howling in the loudspeaker. It is due to the output being picked up by the

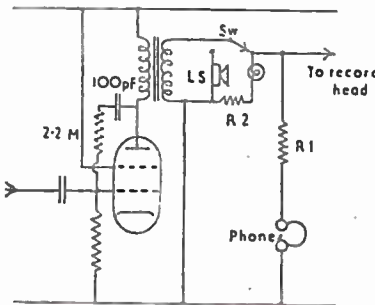


FIG. 1

microphone and re-amplified. It will not occur, of course, if the microphone is put in another room where sound from the loudspeaker cannot reach it. With the microphone in the same room, the loudspeaker should be switched out of circuit when recording. If a pair of high-resistance headphones is connected as shown in Fig. 1, the sound passed to the recording head may be monitored. Vary the value of R1 until a comfortable level of sound is heard in the phones.

Recording Level Indicator

If too high a current is passed through the recording head it will become overloaded. This will cause the recording to be distorted, so some form of recording level indicator is essential.

It is difficult for the ear accurately to judge variations in sound level. Visual indication is far more reliable. A simple indicator may be made by connecting a torch bulb across the secondary of the output transformer as shown. The value of the small resistor R2 should be adjusted until the bulb just glows on the highest permissible current before distortion occurs.

Most commercial recorders are fitted with a recording level meter. Fig. 2

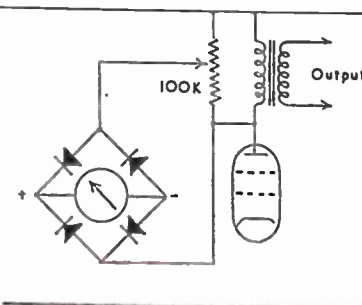


FIG. 2

Fig. 4 shows a simple circuit which is most effective. Under normal conditions, the head is connected either to the input or output of the amplifier. The 0.1mF condenser is charged via the high value resistor connected to the H.T. line. When the switch is put in the other position, the condenser suddenly discharges through the head. A high-peaked impulse occurs, and the head is effectively de-magnetised.

Amplifiers for tape recording are basically similar to those used for ordinary purposes. Owing to the characteristics of the tape, however, an

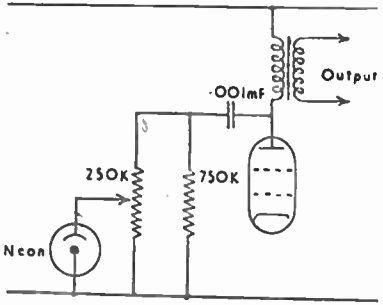


FIG. 3

some means of giving the necessary correction if distortionless reproduction is to be obtained.

Equalising Circuit

Fig. 6 shows a simple equalising circuit which may be added to an existing amplifier. It is best built between the first and second valves of a three valve amplifier. All frequencies are able to pass through the normal coupling condenser C1. Owing to its small capacity, C2 presents a high impedance to low frequencies. High audio frequencies can pass through, and the low frequencies try to reach the grid of the valve via R1 and R2. For recording, the switch is closed. The greater part of the low frequencies, therefore, flow to earth through R3. This causes an

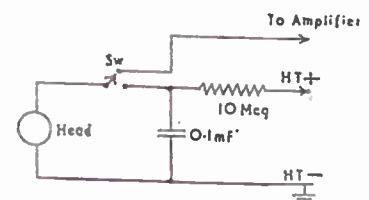


FIG. 4

excess of high frequencies on the grid of the valve, helping to straighten out the dip in the upper part of the response curve of the tape.

The switch is opened on playback. As before, the higher frequencies reach the grid of the valve via C2. The path to

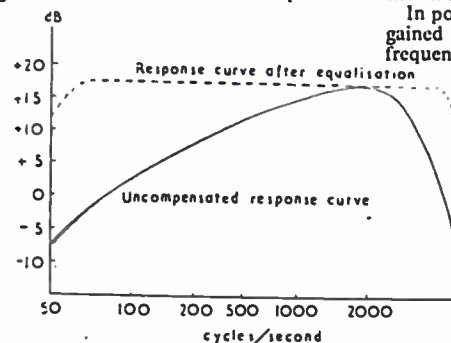
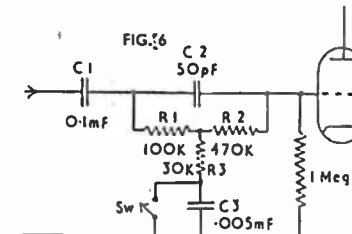


FIG. 5

earth for the lower frequencies through R3 is broken by the open switch and C3. They can now reach the grid through R1 and R2. Some of the higher frequencies now flow to earth via C3, so that with

the switch open, the circuit gives a certain amount of bass boost. This lifts the dip in the lower end of the response curve. By applying treble boost during recording and bass boost on playback, a straight line output is obtained, as shown by the dotted line in Fig. 5.

In point of fact, of course, the effect is gained by attenuating the unwanted frequencies. Circuits may be used which



cathode bypass condensers.

It must be remembered, of course, that all forms of tone control and negative feedback will slightly reduce the amplifier output. This loss is amply repaid by improved performance.

(W.C.R.)

It isn't too early to begin

Planning your Firework Night

WE can all enjoy ourselves with our firework display when it comes along, but we can also arrange quite a programme if we think it out first. Take precautions against accidents, and realise that the Police will soon have you if you try any funny tricks on the highway. Fireworks and the Police should be respected.

Remember the Law

It is illegal to try to make any type of firework on your home premises. This is governed by the Explosives Act, 1875 and the Explosives Act of 1923. You are also liable for heavy penalties which can be imposed by the local magistrates if you are caught.

If you are not clear on this, here is the Home Office ruling. 'Explosive' includes any substance used or made to produce a practical effect by explosion or a pyrotechnic effect. Explosives are divided into seven classes as follows:— Gunpowder, Nitrate, Mixture, Nitro-compound, Chloride mixture fulminate, Ammunition or fireworks. Any suspicions resting on you could mean a visit by the Local Explosives Officer, who would be permitted to search your house, workshop or other premises. Penalty for disregarding these precautions would not be less than £20.

Once purchased, you must not sell any fireworks to another person. You have no licence, and you are not a vendor registered under the Act.

The Police are taking more steps this year than ever to catch firework throwers in the act. Bear in mind this statement given me by a Police Inspector: 'Any person throwing, casting or firing any fireworks in or into any highway, street or public place commits an offence against section 80 of the Act. Penalty, not exceeding £5, but the costs would be probably £3'. So mind you don't get caught.

Reasonable Care

In the event of a display at home, the Court now rules that reasonable care should be taken against accidents. Every year we read of a serious crop of disasters due to negligence.

Don't let your rockets go on to other people's property. You are still responsible. The writer knows of a case where a rocket caught a valuable 20-year-old cypress tree alight. If you have ever tried burning bits of one of these trees, you will realise, only too well, that they hold more turps than you can get in the local oil-shop.

An interesting home firework display can be made more successful, and

better value got out of the items, by a little planning beforehand. Such things as supports, nails, hammer, spalls, matches and flower-pots filled with earth should be in readiness.

Roman candles should be set off at eye-level, stood in a flower-pot which its turn should be on the top of some steps. The step ladder can then be used for the Catherine wheels, while its top level makes an excellent stand for golden rain or similar types.

Firing Rockets

Rockets can be fired from a bottle set in the earth and pointed in the direction you want the rocket to take. Flying Demons and similar items are best set off from a flat box or an old tea tray. No explosive firework should ever be held in the hand, and there are increasing numbers of these in the modern pyrotechnic types.

The manufacturers assure the author that variety this year is greater, and that fireworks are of a very high standard. They do, however, suggest that you buy early. Raw materials are in short supply and the Defence programme has upset all production plans.

(V.S.)

A later article will describe making simple apparatus for a 'set' display.

REPLIES OF INTEREST

Spray Gun

I HAVE a cylinder type vacuum cleaner and wish to make a spray gun to work off it. (D.E.B.—Totterdown).

SPRAY guns are operated from the 'output' (e.g.—pressure) side of the blower, a tube being attached. The gun itself normally consists of a small vessel into which a T-shaped tube with small jet is taken, this producing the usual atomising effect. With this type of sprayer, the suction of the jet of air causes the liquid to rise out of the container. This suction is best created by having a small jet (delivering air only) blowing over the lip of a small tube (this is usually $\frac{1}{8}$ in. to $\frac{1}{4}$ in. in diameter, inside) which descends into the liquid. An examination of fly-sprays, etc., seen in shops will immediately show you how these items are arranged, if you are not already familiar with this point. The nozzle, etc., may be soldered to a lid which can be fitted to a screw-topped glass jar, the latter containing the liquid.

Caravan Problem

I LIVE in a caravan built mainly of hardboard panels, and what appear to be oak beams. The cupboards, etc., are of oak-faced plywood or $\frac{3}{4}$ in. oak panels. The trouble is the manufacturer used iron nails, with the result that the condensation has caused the nails to rust, and all the paintwork shows dark spots at each nailhead, and in some places the hardboard has dark stains where the rust has run down with the moisture. I now wish to paint the interior and would like to know if there is any way of covering the marks before repainting (using a light pastel colour), and if I can coat the nails over to prevent the rust re-occurring as it is impractical to replace the nails with brass ones. Another thing is the oak panels have started to turn black at the bottoms of the cupboards, presumably with the damp, and it is impossible to

glasspaper it off as it goes too deep. Can you suggest any remedy or treatment for this as well? (K.L.S.—Salisbury).

WE would say the trouble originates with condensation inside the caravan, and the only cure is to use a non-condensation paint. Glasspaper off the rust and stains as much as possible, and coat the nail heads with painter's stopping. Get the interior of the caravan as dry as you can by leaving the doors open on a bright sunny day. Then give the whole interior surface two coats of 'Macstet'. This paint is supplied in the following colours—buff, cream, pale green, white, brick red and French grey. If you cannot purchase it locally, apply direct to Devon Commercial Arts, Church Lane, Barnstaple.

Cleaning Gilt Picture Frames
PLEASE tell me the best process to adopt for renewing and cleaning gold gilt picture frames. (F.D.W.—Bath).

IF the frames have been gilded with gold leaf, then renovate by first washing with a detergent such as 'Tide', rinsing clean with warm water, allowing to dry thoroughly and then touching the deficient places with gold size. Directly the gold size has become tacky, apply genuine gold leaf, leave to dry and harden, then wipe over with a clean rag and burnish the surface with an agate burnisher. If the frame has been gilded with gold paint, then clean as above, allow to dry and then apply any good quality gold paint. When dry and hard, apply a coat of colourless varnish.

Rubber Floor Tiles

I HAVE in my kitchenette and bath-room, rubber floor tiles which through old age have become rather discoloured and worn. I would like to renovate them and have been thinking of using lino

paint. Please tell me the best procedure. (H.L.—Waltham Cross).

WE are of opinion that lino paint would prove useless for renovating the rubber tiles you mention. Paints do not readily take to rubber, colouring being perforce added during manufacture. The following method has been recommended though, and if you care to give it a trial, here it is:—coat the tiles with white of egg, or casein dissolved in ammonia, then apply formalin to harden it. You can paint over this with a coloured celluloid varnish with quite good results. You can make the varnish by shredding celluloid in acetone and adding spirit aniline dye to colour.

Melting Brass

COULD you tell me how to make some kind of plant for melting brass, copper and aluminium in large amounts and what heats to use. (E.B.—Whitwick).

WE regret we cannot recommend the building of any furnace suitable for melting large amounts of brass, etc., as such plants call for specialist knowledge and experience, both to install and to operate. Small quantities of up to, say, 1 lb. can be melted in a furnace made with firebricks and heated by several large gas burners of the blowpipe type, under forced draft conditions—that is, the gas is mixed with air under fairly high pressure.

Bronzing Plaster

COULD you give me a method of bronzing a plaster cast bust, also where can I purchase the materials needed. (W.D.—Pontardawe).

PLASTER casts can be bronzed in various ways. For many purposes it suffices to spray paint with bronze paint, which is bronze powder in a suitable vehicle—usually cellulose. Another method is to have them electrolytically coated, while very fine effects can be obtained by painting the cast with gold size and pouring bronze powder over it. It dries hard in a few minutes, and the surplus powder can be shaken and dusted off and used again. The above materials can be had from any good oil colourshop or artist's material shop.

picked up cheaply at Sales).

Ornamental gimp completes the job. Small castors or 'domes of silence' are a useful addition, saving wear not only on carpets and lino but on the base of the box. The cretonne should be adequately sewn and tacked on, but not excessively so, since at some future date it may be thought advisable to take it off for cleaning. (W.A.B.)

MAKING A STUFFED BOX SEAT

(Continued from page 407)

idea to line the inside of the box. Cheap hessian is good enough for this purpose.

Although the box need not be stuffed outside with flock, it may be a good idea to put a layer of wadding round it, to smooth off hard corners and flatten out irregularities. The

cretonne is stretched and sewn on (usually after working out the problem of how the pattern is to run, since rarely, if ever, has one so much material that one can lay the material exactly as one fancies and trim away any surplus. Usually one works with remnants

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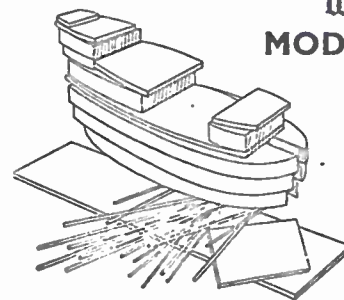
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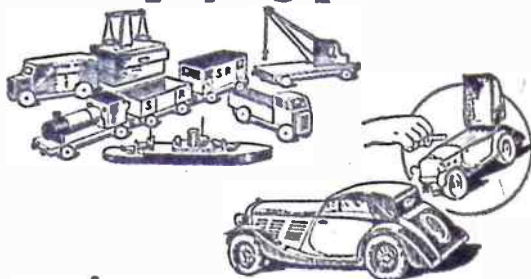
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