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FOR ALL
HOME CRAFTSMEN

Also in this issue:

MAKE A MAINS
AMPLIFIER

'SAND' MOTOR
FOR MODELS

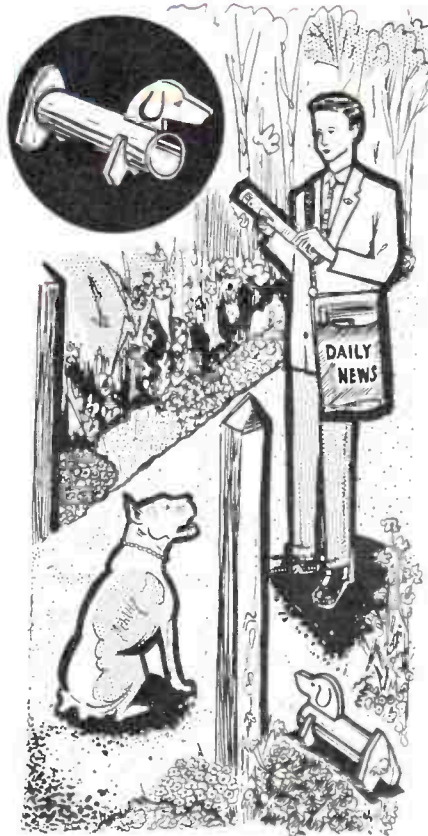
A WINCH FOR
MODEL GLIDERS

COLLECTORS' CLUB

PLAN FOR DOLLS'
HOUSE FURNITURE

TROPHY SHIELD
PATTERNS

ETC. ETC.



DONALD THE 'DAILY' DACHSHUND

A novel
'rack' for
the newspaper
delivery boy



Up-to-the-minute ideas

Practical designs

Pleasant and profitable things to make

World Radio History

5^p

HANS Christian Andersen's fairy tales have been depicted on stamps, match covers and brewery labels.

The Carlsberg soft drink (see illustrations) is a favourite among all collectors.

In 1935, the H.C.A. set of silverware, consisting of 12 spoons, a knife and fork, a porringer and a handled cup was issued by Mr Sofus Sorensen, a silver-smith from Horsens in Jutland. The task of making the spoons was given to Knud Moller, one of Denmark's most talented silversmiths.

Moller had been deaf and mute since early childhood (due to an illness), but being an artist at heart he went into this project with enthusiasm. First he cut the models in steel in 'haut' (bass) relief, then his helpers cut out the negatives. Moller himself cut the pictures in silver.

HANS CHRISTIAN ANDERSEN



The final result, mute testimony to his artistry, is easily recognized in these 12 spoons, each representing one of the Hans Christian Andersen fairy tales.

The solidity, the smoothness, the wide flowing lines and generous size of the spoons, seem to give the impression of the so-called 'Durability of the Danes' and are more than fitting mementos by the Danish people of their most beloved of all writers, Hans Christian Andersen.

According to most English translators, these famous fairy tales were written purely for children. But from the

original Danish writings, to quote from Svend Larsen, 'they were written for children, but it was his (Hans) hope, that also their parents would listen, as several of his stories are more for grown-ups than for children — for only the mature can understand the depth of these writings'.

His first stories were founded on folklore, and it was his ability to endow fanciful creatures with the skill of action and conversation, as well as his vivid descriptive style of writing, that have kept his stories still unequalled.

Andersen's fairy tales are as popular today as they were when first published in the English language in 1846.

“SALLY IN OUR ALLEY”

OF the many songs composed by Henry Carey, only "Sally in Our Alley" has achieved lasting popularity. Carey's name is connected mainly with 'New English Operas in the Italian Style', many of which he produced at Drury Lane. His parody of the bombastical tragedy of the time, produced at the Haymarket Theatre in 1734, is still remembered by reason of its remarkable title: 'Chrononhotonthologos' — 'The most tragical tragedy that ever was tragedized by any company of tragedians.'

The origin of "Sally in Our Alley" is thus given by the author himself: 'A shoemaker's 'prentice, making holiday with his sweetheart, treated her with a sight of Bedlam, the puppet shows, the flying chairs, and all the elegancies of Moorfields, whence, proceeding to the Farthing Pye House, he gave her a collation of buns, cheese-cakes, gammon of bacon, and bottled ale — through all which scenes the author watched them. Charmed with the simplicity of their courtship, he drew from what he had witnessed this little sketch of nature.'

This is the origin of the fine words of the song, of which, the author adds with pride, Addison expressed his approbation. The melody has been described as one of the most striking and original that ever emanated from the brain of a musician.

(R.L.C.)



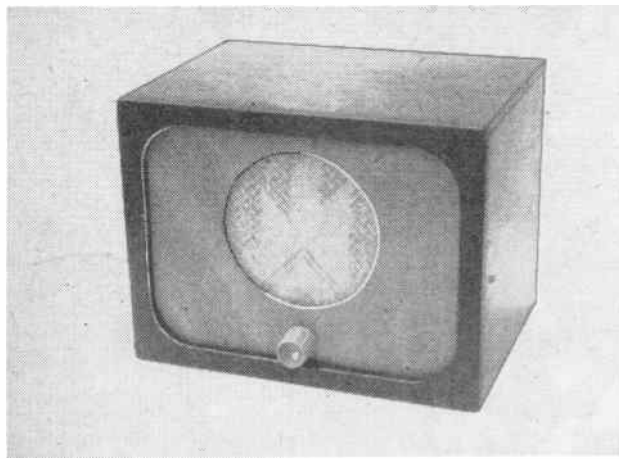
A 4-WATT A.C. MAINS AMPLIFIER

By *F. G.
Rayer*

such as tone controls can always be added later. A 6 in. speaker is included, but there is no reason why a separate speaker, with cabinet, should not be used instead. Larger speakers will also be satisfactory. Very small speakers, as used with small battery sets, are not very suitable, however, because they will not be able to handle the full output without overloading.

Chassis

The chassis should be of metal (not wood) and needs to be about 5½ in. by 10 in. by 2 in. deep. The exact size is not



THIS amplifier uses only two valves, plus rectifier, and is therefore quite easy to construct, and can be built at moderate cost. These two valves are types giving a high degree of amplification, so that good volume will be obtained with 78, 45 or 33 r.p.m. records, with the usual type of general purpose or turn-over pick-up. There is also sufficient amplification for reasonable results with a microphone of carbon, moving-coil, or crystal type. For radio reproduction a radio tuner can be connected, if desired, and this is sometimes useful.

The circuit is shown in Fig. 1, and though component values are not exceptionally critical, unnecessary modification to the values given should be avoided. In simple amplifiers, high tension is often drawn directly from the mains. This has the disadvantage that the amplifier and other equipment may be 'alive' so a mains isolating transformer has been used to avoid this, to prevent the danger of shocks while handling the

pick-up, chassis, etc. The transformer provides 250V. H.T., and 6·3V. for the valve heaters.

Unnecessary complication in the circuit has been avoided, because items

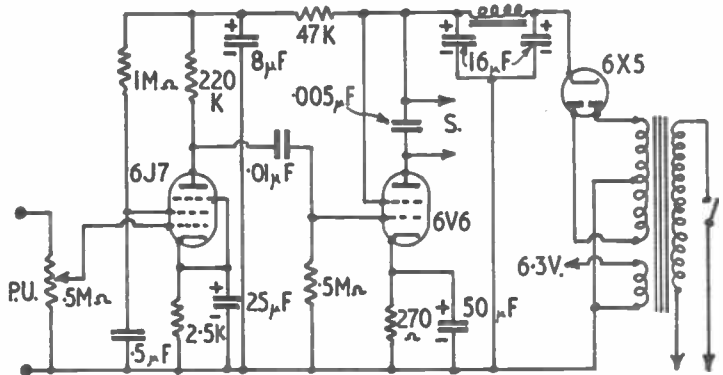


Fig. 1—The circuit

important, and the positions of valves, etc., can be modified a little without influencing results. A ready-drilled or surplus chassis will thus usually be suitable, unused holes being ignored. If a chassis is to be made, this can be done quite easily by cutting 2 in. by 2 in. pieces from the corners of a sheet of aluminium 9½ in. by 14 in., so that front, back and side runners 2 in. deep can be bent. An accurate bend can be made if the metal is clamped between two pieces of fairly stout wood held with a vice.

Large holes can be cut with a metal-cutting fretsaw, proceeding slowly. Or a line of small holes (say ⅜ in.) can be drilled, the piece broken away, and the edges cleaned up with a file. Adjustable cutting devices to make valveholder and other large holes can also be obtained. It does not matter whether the valveholders are above or below the chassis, provided the tags and valve pins are well clear of the metal.

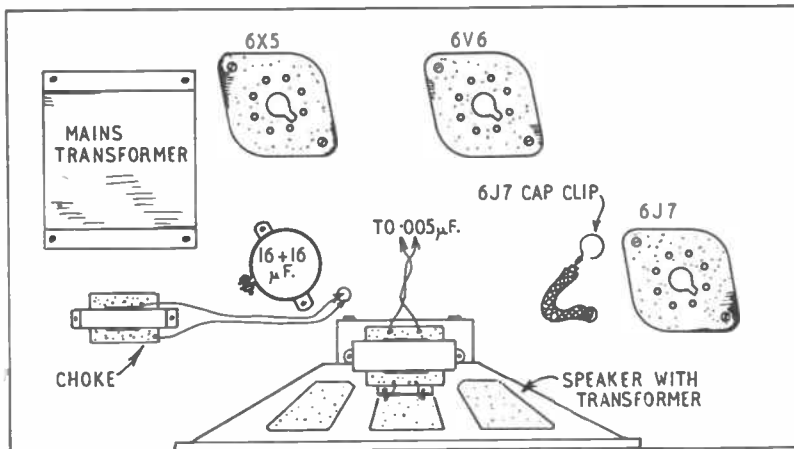


Fig. 2—Chassis layout

(usually about 3V. to 6V.). The transformer secondary is wired to the P.U. sockets.

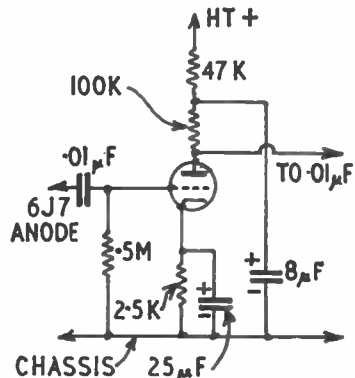


Fig. 4—Intermediate amplifying stage

When using a microphone, the lead will usually need screening in exactly the

THERE are occasions when a job of work demands the use of a bar-cramp, but, unless the need is likely to recur frequently, it may not warrant the expense of buying this tool. Quite a useful substitute can be made from a pair of ordinary small clamps, as figured in our illustrations. The ends of the clamps must be sawn off to allow sufficient clearance for the screws where they engage the work.

Fig. 1 shows the normal set-up, using an appropriate length of wood with a hole bored out at each end to take the clamps. If only one clamp is available, a bar clamp can still be made, as seen in Fig. 2. Here only one hole is bored through the wood to take the clamp, the other end terminating in a screwed-on small block of wood, or an iron angle bracket can be utilized. (P.P.)

same way as when using a pick-up for records, to avoid hum. Trouble introduced by unscreened leads or other faults in the microphone, radio or pick-up circuit can easily be identified, because it will become worse as the volume control on the amplifier is turned towards maximum.

For best reproduction, the speaker should be enclosed in a cabinet. A cabinet to house amplifier and speaker should have an aperture to match up with the speaker, and a hole for the volume control spindle and bush. The amplifier can then be pushed in from the back, and screws inserted through the fixing holes in the speaker.

Extra valve

When using a pick-up or microphone of a type which gives only a small output more volume can be obtained, if desired, by adding another valve. This can best go between 6J7 and 6V6, and the circuit and component values for a 6J7, L63, CV1932 or CV1934 are shown in Fig. 4.

| COMPONENT LIST | |
|--|--|
| 6J7, 6V6, and 6X5 valves, or equivalents. 3 octal holders. | |
| Resistors: | |
| 270 ohm 1-watt (Red-purple-brown). | |
| 2.5K (Red-green-red). | |
| 47K (Yellow-purple-orange). | |
| 220K (Red-red-yellow). | |
| ½ megohm (Green-black-yellow). | |
| 1 megohm (Brown-black-green). | |
| All ½-watt or similar. | |
| Condensers: | |
| ·005µF paper. | |
| ·01µF mica. | |
| ·5µF 350V. paper. | |
| 8µF 350V. or similar. | |
| 16µF plus 16µF 350V. or similar. | |
| 25µF 25V. | |
| 50µF 50V. | |
| ½ megohm volume control with switch and knob. | |
| 60mA smoothing choke. | |
| 6·3V. 2 amp, 250/0/250V. 60mA mains transformer. | |
| Permanent magnet speaker with 5000 ohm transformer. | |
| Chassis about 10 in. by 5½ in. by 2 in. deep. | |

The heater should be wired in parallel with that of the other valves.

An improvised Bar Cramp

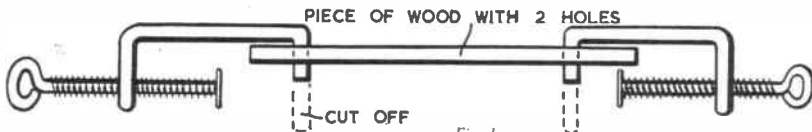


Fig. 1

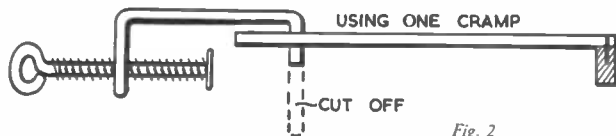


Fig. 2



THE following details of interesting and novel projects made from cows' horns have been submitted by A. Gregory of 13 King St, Wollaston, Stourbridge.

For a television lamp Mr Gregory used two cows' horns obtained from the local abattoir, and other materials used were a lamp switch, length of flex, two 25 watt twisted 'torch' bulbs, and a suitable baseplate. The horns were first scraped with a piece of glass and finished with glasspaper before treating with amateur french polish, and details of construction are indicated in the illustration. The screw holes through the horns where they are attached to the base can either be countersunk and filled or covered with a piece of brass tube.

Another use made of cows' horns is making flower vases on the same lines as the television lamp. (P.P.)

BENDING and kneeling in performing household chores soon cracks the rubber soles on house-slippers. These, however, need not be discarded, but can be easily and cheaply renovated. An old leaky, or otherwise unwanted, rubber hot water bottle can be cut up to provide a new pair of soles, and these can be stuck on to the slippers with suitable adhesive, giving them a new lease of life at practically no cost.

After cutting to size, but before sticking on, it would aid the adhesion if a very narrow strip all around the edge of the sole is chamfered to about half the thickness of the rubber, using an old razor blade for this purpose.

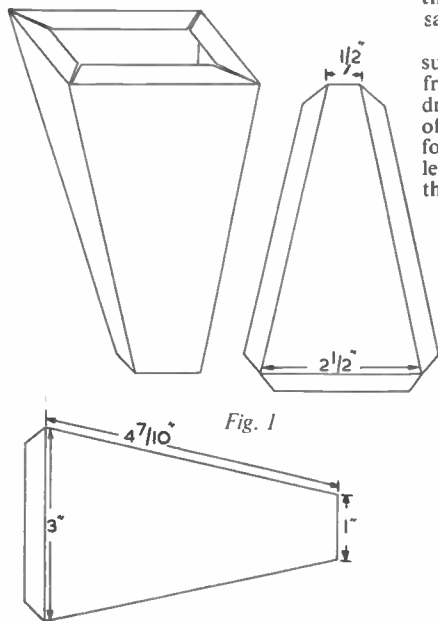
A TOY MOTOR DRIVEN BY SAND

A CARDBOARD motor, powered by a falling stream of fine quality sand, will drive a wide variety of lightweight models and simple articulated figures, details of which will be given in a subsequent issue.

To make such a motor it will be convenient to use a strong shoebox measuring 6 in. by 13 in. and 4½ in. deep. Begin by strengthening the box with lengths of ½ in. diameter dowel as follows: Cut two 13 in. long dowel rods and secure them along the inside edges of the box, using drawing pins and wide strips of gummed paper. Stand the box on end and cut a neat round hole 1½ in. in diameter in the middle of the top.

In a subsequent issue A. E. Ward will show how to make toys and models to be worked by the Sand Motor.

Make the downward tapering sand chute from four stout cardboard panels marked out according to the patterns in Fig. 1. Cut them out, carefully, using scissors or a sharp knife. Score along the lines at the bases of the tabs and fold the tabs over, so that the four panels can be glued together. When the sand chute has been assembled, it must be glued



exactly underneath the hole in the top of the box.

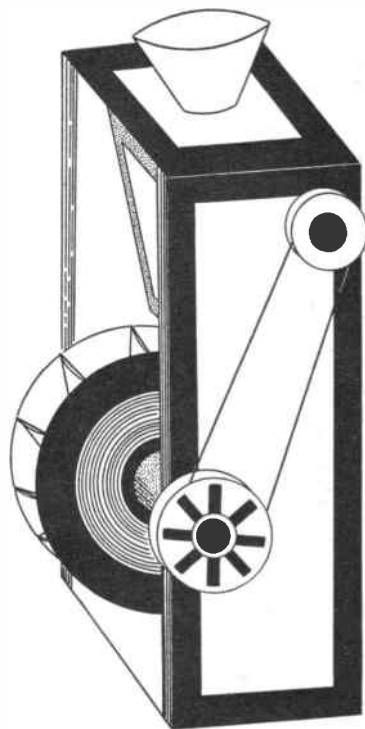
Use a pair of compasses to mark out two 6 in. diameter circles upon strong cardboard and cut out the discs to form the sides of the sand wheel.

Cut out a strip of cardboard measuring 13 5/8 in. long and 1½ in. wide. Form the strip into a shallow cylinder, 4 in. in diameter, by gluing the ends together, allowing an overlap of 1 in. Place glue upon the rims of the cylinder and secure the discs on either side. Make sure that the groove of the wheel so formed is 1 in. deep all around. (See Fig. 2.)

Make twelve rectangular steps measuring 1 in. by 1½ in., with ¼ in. wide tabs upon three sides as depicted in Fig. 2. Cut out the steps and score along the bases of the tabs, using a ruler and penknife, before folding them over. Glue the steps in place around the wheel in such a manner that the groove is divided into twelve equal compartments.

Bore holes in the sides of the box 5 in. above the base, so that the wheel can be mounted upon a knitting-needle spindle, with the steps on one side, just below the base of the chute (Fig. 3). Tidy holes can be made with a cork borer. Mount the sand wheel between two large corks upon a steel knitting-needle and satisfy yourself that it will work by pouring dry sand through the hole above the chute. As the sand falls the wheel should run rapidly.

Wooden discs about 1½ in. in diameter, such as large draughtsmen or wheels from old toys, can be used to make two drive wheels, which are fixed at each end of the knitting-needle spindle. Cut out four cardboard circles with diameters at least ½ in. greater than the diameters of the wooden discs. Glue the cardboard

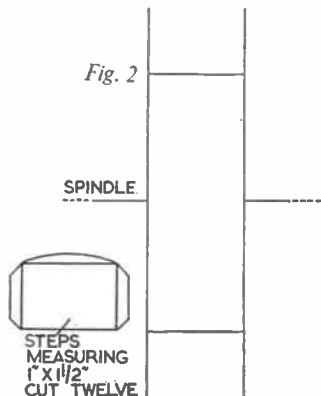


circles on either side of the wooden discs. Bore narrow holes right through the drive wheels and mount them firmly upon each end of the spindle, outside the sides of the box.

In order to make your motor more interesting when it is in motion, you can connect one of the drive wheels on the sand wheel spindle to a drive wheel on a second spindle, which will operate an attractive propeller device. Bore holes for the second spindle in the top part of the box, in such positions that it will be possible to fit the spindle behind the sand chute. Put the spindle in place. Make a third drive wheel as already described and mount it upon one end of the upper spindle, outside the box. Connect the upper and lower drive wheels, using a friction band of thick wool.

The propeller is made in the form of a small cardboard cross, which is glued upon a small wooden disc and mounted outside the box, upon the free end of the upper spindle. When sand is allowed to trickle on to the sand wheel, the little propeller will be driven round in an intriguing manner. Lightweight models can be driven by means of a friction band of wool passing around the other drive wheel on the sand wheel spindle.

Fig. 2



● Continued on page 95

MAKING A GLIDER WINCH

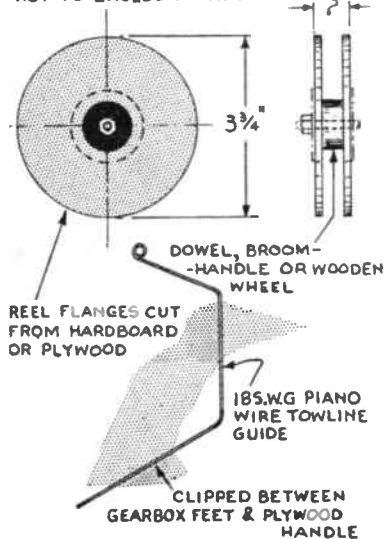
THE value of a model glider-winch, particularly in flat-calm flying conditions, as described in a previous article in this series, cannot be overstressed, and every serious model aircraft enthusiast should be equipped with one. Commercial winches are available, but a most efficient type can be made quite easily at home for a few shillings. Here's how!

The winch utilizes the mechanism of a small grindstone obtainable from Woolworths — the type which can be fastened to the edge of a bench or table by means of a screw and pad. This will cost you about 3/9.

By G. Allen

Remove the abrasive wheel and its retaining nut and washers from the spindle, and measure the width of the wheel. The overall width of the spool, which it is now necessary to make, should not exceed this measurement.

NOT TO EXCEED WIDTH OF GRINDSTONE



Hardboard $\frac{1}{8}$ in. thick, or thin plywood, is used for the two flanges of the spool. With a pair of compasses, draw two circles on your chosen material to the diameter given in the diagram. Cut them out with the fretsaw, trim clean with a file and glasspaper, and drill the centre of each disc with a twist-drill large enough to permit the holes to accept a neat fit for the spindle of the

mechanism. A $\frac{1}{16}$ in. drill was found to be just right for the winch illustrated.

Now cut a slice from a length of 1 in. diameter hardwood dowel or broom handle, and drill the centre of the disc with the drill used for the flanges. The thickness of the disc will, of course, depend on the width of the abrasive wheel and the thickness of the material used for the flanges. A small wheel from a wooden toy could also be used for the hub of the winch spool provided its thickness is within the required limits. Such a wheel was, in fact, used on the original.

Join the flanges to the hub of the spool with adhesive. Slip each component over the spindle of the mechanism during assembly to ensure correct alignment.

A strip of plywood or hardwood 1 in. by $\frac{1}{2}$ in. and about 1 ft. long, clipped between the feet on the mechanism casing and the screw-pad, provides a simple and effective handle for the winch.

To prevent the towline (winch cable) from fouling the spool and spindle during operation, it is necessary to provide the line with a guide. Bend this from 18 S.W.G. piano wire to the shape shown in the diagram. Adjust it until, when clipped between the feet of the mechanism and the wooden handle, the loop of the guide is directly in front of the spool and a little above its centre.

The line itself can be made up from

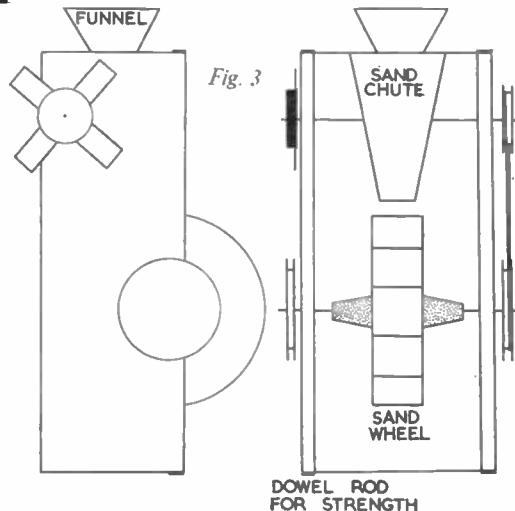


any tough cord or thread such as nylon. Galleon cord (obtainable from Hobbies branches) was used on the original. If you use the same material, join four or six skeins together, winding one skein at a time on to the spool, starting with a slip-knot.

● Continued from page 94

Sand-powered Motor

When you have completed your motor you can set about improving its rather bare appearance. A really pleasing effect can be achieved by using brightly coloured gummed paper. Tidily conceal the dowel rods and any printing upon the cardboard. Alternatively, you may choose to paint your machine, using gay poster colours. Use a jug to pour sand into the chute and prevent sand from being spilled upon the top of the motor by placing a funnel into the hole. A tin lid, placed underneath the wheel, will provide a tray in which the sand can be collected and re-used.



DONALD THE DACHSHUND



IN many districts the newspaper delivery lad leaves the papers at some distance from the house, to be collected by the customer at a convenient time. This is sometimes because of the long walk entailed to the house or maybe there is a watchdog barring his path!

This arrangement is all right when the weather is dry, but, if unprotected, the paper can become a soggy mess in the rain, and some sort of container is obviously desirable. The paper can then safely be left for collection at leisure.

Our novelty design for Donald the 'Daily' Dachshund will serve this purpose admirably, besides being an attractive and interesting project.

Although the measurements and thicknesses of wood may be altered to suit the material at hand, we have given overall dimensions for guidance. The container should be a piece of aluminium, tin or linoleum rolled to make a $3\frac{1}{2}$ in. diameter tube about 16 in. to 18 in. long as indicated in Fig. 1.

Enlarge the squares

The dog's head is shown squared in Fig. 2 and it is a simple matter to enlarge the squares to $\frac{1}{2}$ in. and draw the shape required, transfer the outline to $\frac{3}{4}$ in. or 1 in. thick wood and cut out with a fret-saw. Clean up with glasspaper and screw it centrally to the tube as indicated in Fig. 3.

Now draw out the shapes detailed in Fig. 4, commencing with the centre line AB. The back legs and front legs are both shown together in Fig. 4. The back legs are the whole outline and the front legs are shown shaded. A circle of $\frac{3}{4}$ in. wood, $1\frac{1}{2}$ in. radius, is now cut and pinned or screwed to the back legs and to this circle is pinned the tube as shown in Fig. 5.

The front legs are held in place by two bolts pushed through holes in the tube and tightened up on the outside as shown in Fig. 4. To get the correct positions for

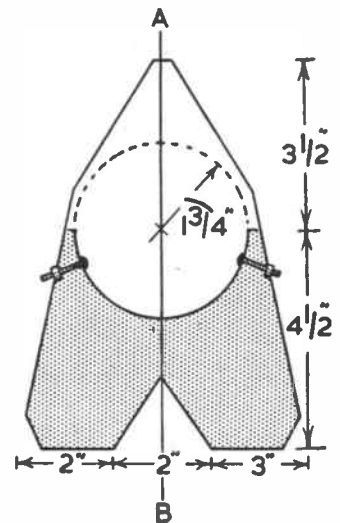


Fig. 4

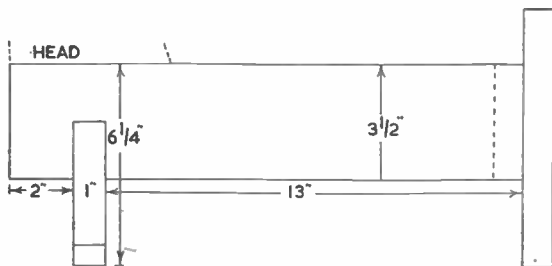


Fig. 1

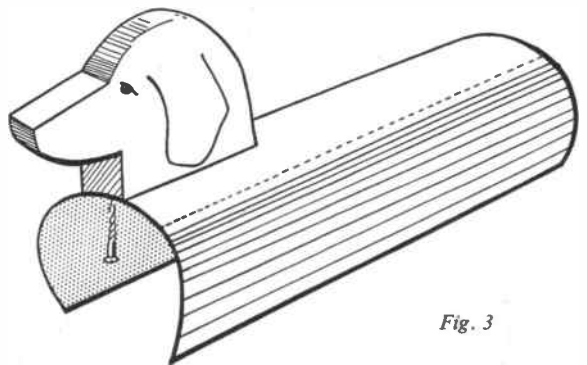


Fig. 3

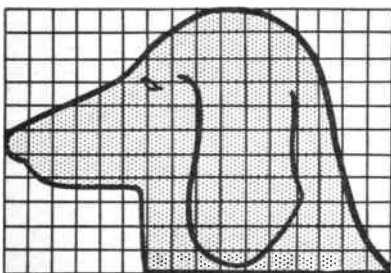


Fig. 2—Enlarge squares to $\frac{1}{2}$ in.

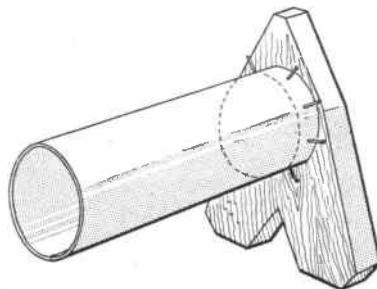
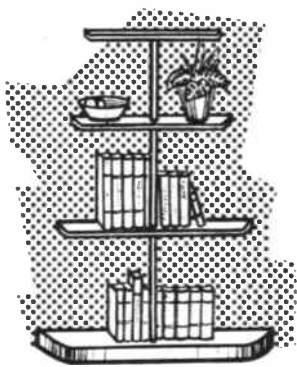


Fig. 5

the bolt holes, first drill the legs, then place the legs in position and drill the tube.

When tube, legs and head have been assembled they should be given one coat of wood preservative before painting. Give an undercoat and two top coats of exterior quality paint. Allow each coat to dry thoroughly before applying the next. (M.h.)

A Simple Shelf Arrangement



By V. Sutton

THERE are times when space and the difficulty of putting up supporting fixtures may rule out a wide set of shelves but if you work out this idea on an old cornice pole or a couple of broom handles you will get three good shelves, and a platform, using very little wood.

Most timber-yards stock shelf boards up to 8 in. wide. As a rule these are not quite so stout as a floor board. Here you have a good clean wood, 1 in. thick, and something that will stain or paint well. It depends on the space you have but this fitment looks well between the fireplace and a door. With its graduated shelf design it is not too obtrusive. A good figure for this pattern would be 12 in. top, 15 in. centre and 18 in. base, or if you increase that, then keep to those proportions. (See front and side sections in Fig. 1.)

As you will see, the shelves are neatly finished off with 1 in. round moulding which you can get at any Hobbies' stockist or branch. A fancy beading can be used if desired.

The fixing

The broom handle or handles go through the two shelves, about 2 in. away from the wall. They support the top shelf from underneath. At the base, they pass through the holes cut in the two centre shelves and then through the base board, which is now a platform design, slightly overlapping all round.

As shown in Fig. 2, $\frac{1}{4}$ in. dowel rods are used for fixing and short lengths are glued into the back edge of the shelf and should correspond exactly with the position in the wall where you have drilled the holes and prepared the position with a wood plug. Two holding points will be

enough for these shelves as the weight will not be considerable.

Design arrangement

In making up the design you may consider what you are going to put on this fitment. If you intend to have rather a lot of books, then adjust the uprights to hold the books in position. In this design the support was an old cornice pole picked up very cheaply from the local second-hand dealer.

You can obtain plastic moulding to cover the shelf edges and as you make up the fitment you may have further ideas regarding style and finish.

The otherwise spindly appearance of the three shelves is avoided by the incorporation of a built-up platform base.

Making the platform

Build up the depth with 4 in. or 5 in. planed wood as shown in Fig. 2. Arrange the pieces so that you can then bend the plywood panel round at a neat angle. It is quite an idea to have two of these struts coming dead centre to help hold the upright. In the one I made, all this woodwork was made up first and fully assembled. Allow for the skirting in the bottom platform. For the top of this a piece of plywood is best and an overlap of $\frac{1}{2}$ in. would be ideal.

For a finish, you should not overlook the value of the many stick-on plastic fabrics now on the market. These are tough, very colourful and can be obtained in excellent wood grains, mottled effects and plain shades.

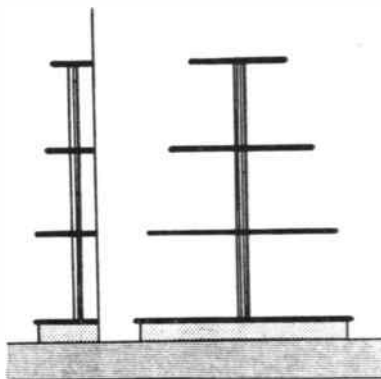


Fig. 1

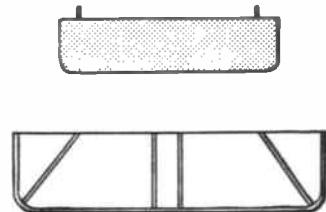
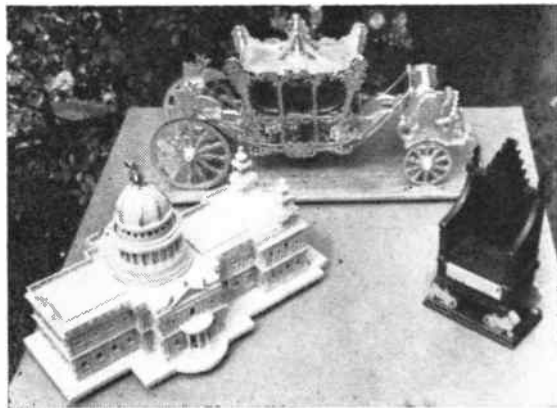
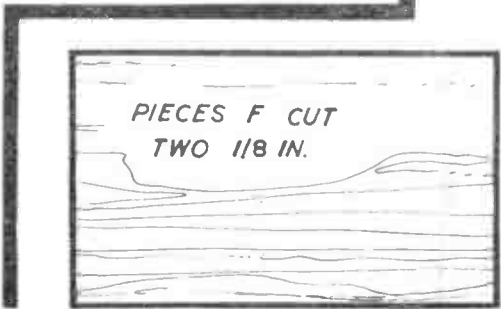
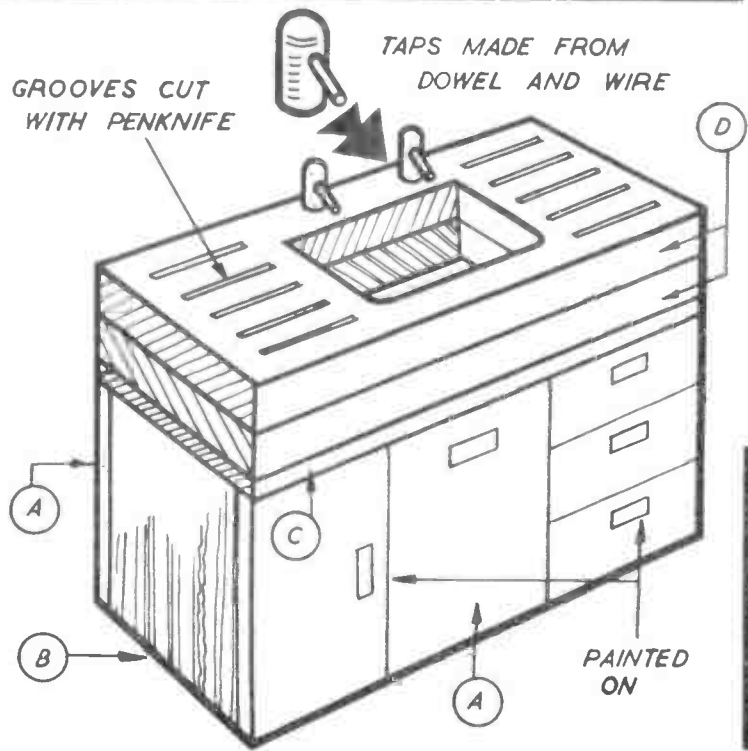
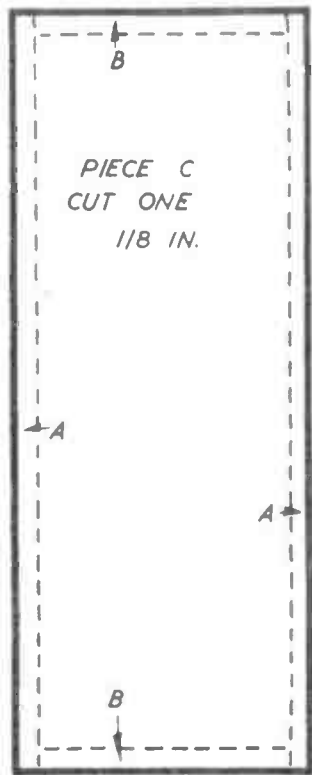
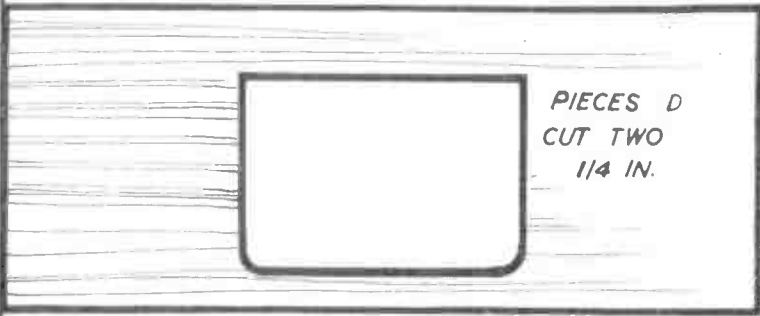
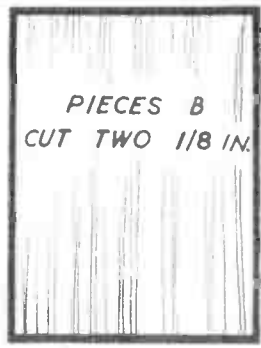
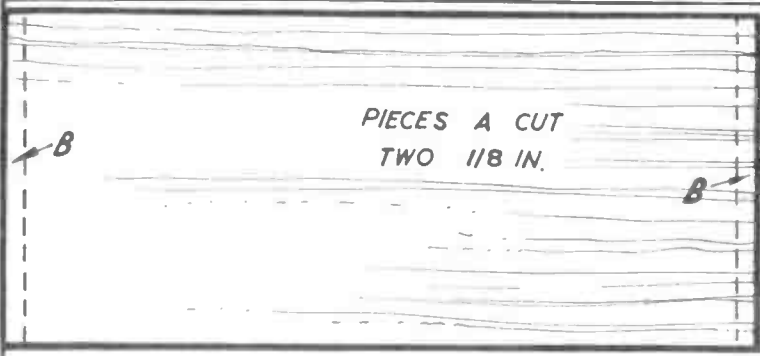


Fig. 2

London reader's fine Modelling

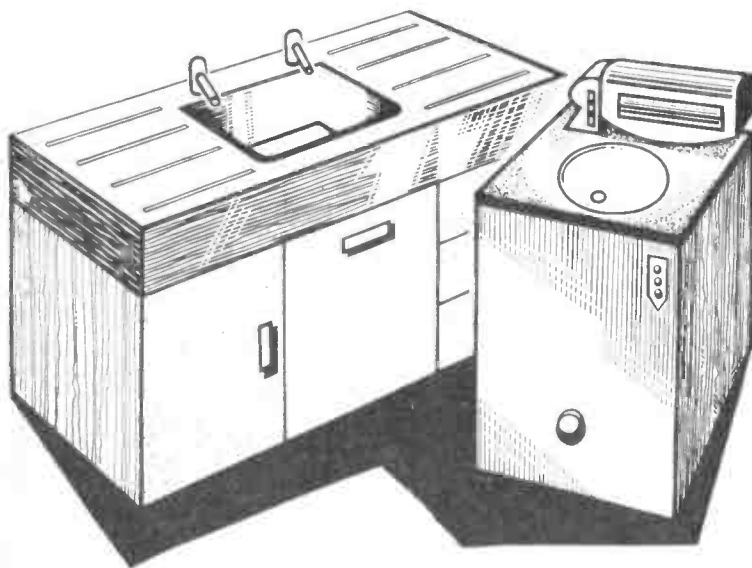


These fine models of the Coronation Coach and Chair and St. Paul's Cathedral won a first prize at a handicrafts exhibition for Mr E. White, 115 Vanbrugh Hill, Greenwich, London, S.E.10.





DOLL'S HOUSE FURNITURE PATTERN SINK UNIT & WASHING MACHINE

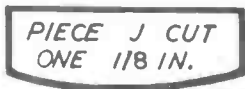


PIECES K CUT
ONE 1/4 IN. AND
ONE 1/8 IN.

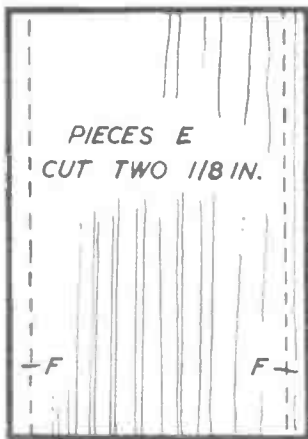


PIECE H CUT
ONE 1/4 IN.

GLUE TOGETHER



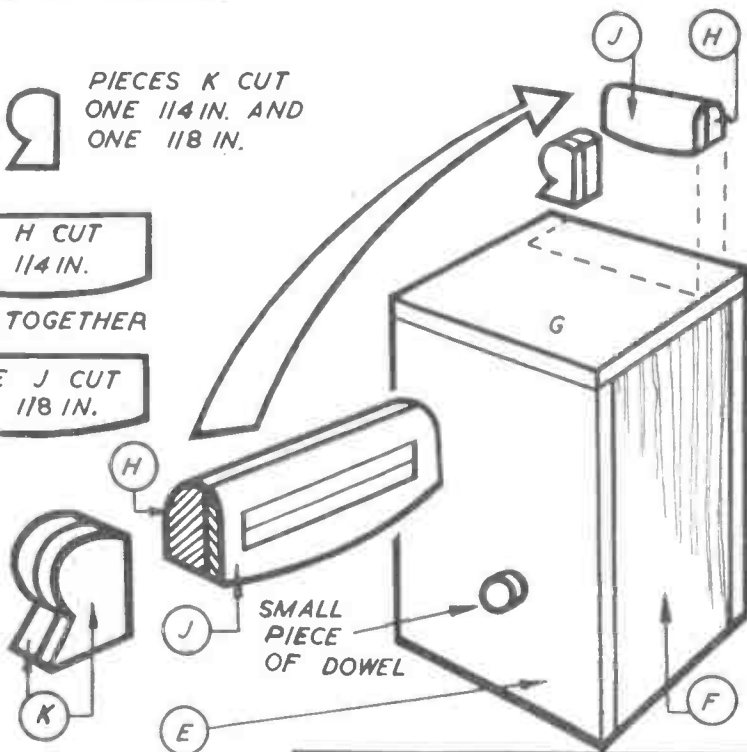
PIECE J CUT
ONE 1/8 IN.



PIECES E
CUT TWO 1/8 IN.



PIECE G
CUT ONE
1/8 IN.



SMALL
PIECE
OF DOWEL

PRINTED
IN ENGLAND

PANELS OF WOOD REQUIRED
TWO G2, ONE G4

LOW VOLTAGE FAIRY LIGHTS

IN many models it is best to use small, low voltage bulbs. These can be run from a dry battery, accumulator, or mains transformer and will usually be fairly well in keeping with the scale of the model, giving a realistic effect.

Ordinary flashlamp or torch bulbs can be used and flashlamp bulb holders such as the Hobbies No. 732 (7½d., post 3d.) will be handy for wiring up the circuit to these. For controlling the bulbs the Hobbies miniature switch No. 731 (10d., post 3d.) is satisfactory, and only ¼ in. in diameter. Or the slightly larger switch No. 730 (1s. 6d., post 3d.), may be used, and is 1½ in. in diameter. It should be noted that these switches are for low voltages only, and not for mains circuits.

By 'Modeller'

In small models, or where a very small bulb is needed, the pea bulb with holder No. 733 (9d., post 3d.) will do well, as it is only about ⅙ in. in diameter. There is also a doll's house electric lighting set available giving six lighting points and costing 7s. 11d. (post 9d.)

With such low voltage circuits there is no risk of shocks at all, even if bare joints and parts are touched. Because of this they are particularly suitable for all kinds of illuminated models such as dolls' houses, railway layouts, garages, etc.

When a transformer is correctly used to obtain current from the mains, the circuit is just as safe as if a battery were used. If a fairly large number of bulbs will be used, transformer running will be more economical than batteries, though most models can be illuminated quite well with batteries.

Choice of bulbs

Ordinary small torch bulbs are made for 2.5 volt and 3.5 volt. These screw into holders of the kind mentioned. Other bulbs can be obtained to fit these same flashlamp sized holders, and may be more convenient to suit a transformer or battery to hand. For very low current consumption, the 6 volt .04 amp type of bulb used for the rear light with cycle dynamo sets can be fitted. For a 6 volt transformer or accumulator, the 6.3 volt .3 amp radio dial light type of bulb is very good. For 12 volt similar bulbs, but rated at 12.6 volt, 15 amp would be satisfactory.

It is not necessary to provide the exact voltage marked on the bulbs. It is quite usual to fit 2.5 volt bulbs in torches with 3 volt batteries, and 3.5 volt bulbs in flashlamps with 4.5 volt batteries, to obtain a brilliant light. But for continuous running in a model, it is best not to use a voltage higher than that marked on the bulb, which will usually light brightly enough even if the voltage is a trifle low.

When the supply voltage is about the same as the bulb voltage, the bulbs are wired in parallel, as shown at 'A' in Fig. 5, with switches as necessary. For example, the 3.5 volt bulbs shown could be run from a large cell 3 volt dry battery. The 6 volt .04 amp type bulbs could be run from a 6 volt battery or transformer. The 6.3 volt bulbs would do for a 6 volt or 6.3 volt surplus radio transformer, and so on. Any number of bulbs can be used, within the ability of the battery or transformer to supply current.

If torch bulbs or pea lamps of a particular voltage are to be run from a higher voltage, they can be wired in series in pairs, as shown at 'B'. Here 3.5 volt bulbs are in pairs, so that they make up 7 volts. This would do well for a 6 volt accumulator or transformer, or a 6.3 volt transformer.

At 'C' three bulbs are in series, two such circuits being shown, and this

would do well for a transformer giving 8 volts. Other bulbs can of course be added, or only three may be used, if these are sufficient.

In this way it is usually possible to make up a voltage which will suit a transformer which may be to hand, or which may be fitted to run an electric motor or train. For example, four 3.5 volt bulbs all wired in series would do well for a 12 volt supply.

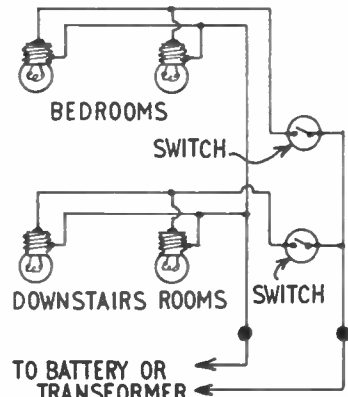


Fig. 6.—A simple Doll's house circuit.

With circuits like those in Fig. 5 two points should be kept in mind. If the bulbs are in parallel, as at 'A', all should be of the same voltage, so that they will light at similar brilliance. But when they are wired in series, as at 'B' and 'C', they should be of the same current rating. This will be so if the bulbs are of the same type. But if they are of different types, and thus of different current consumption, the voltage will not be equally divided. For example, two 6.3 volt .3 amp bulbs, or two 6 volt .04 amp bulbs, in series, would do well for a 12 volt supply. But if one 6.3 volt .3 amp bulb and one 6 volt .04 amp bulb were wired in series, the .3 amp bulb would only glow dimly, and the .04 amp bulb would light so brightly that it would burn out.

Doll's house circuit

A simple doll's house circuit is shown in Fig. 6, with two bulbs in the bedrooms, controlled by two switches. All the bulbs are in parallel (equal to 'A' in Fig. 5) so that a 3 volt dry battery would do for 3.5 volt bulbs, or a 6 volt transformer for 6 volt or 6.3 volt bulbs.

A practical wiring plan of this circuit is shown in Fig. 7, the switches being

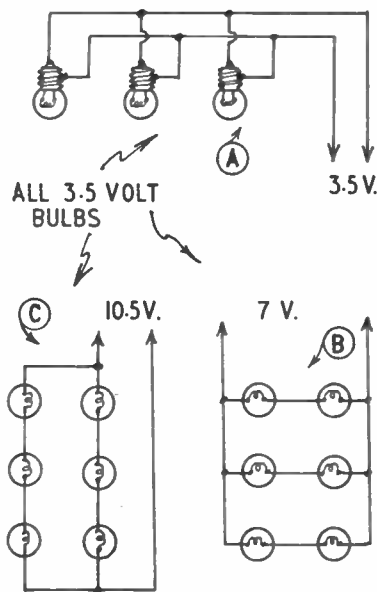


Fig. 5.—The effect of various methods of connection.

fixed outside the house in this case. The holders are screwed to the ceilings of the rooms, and leads may often be passed through small holes, so that they are not visible.

Thin covered wire is convenient for wiring up. If wiring is done before papering the rooms, the paper will hide connections, which should run neatly from point to point. It is a good plan to fix all switches so that they are 'off' when the knob is up, just as with house room lights. In large circuits, additions or changes will be easier if a habit is made of including all switches in one side of the circuit — say battery positive.

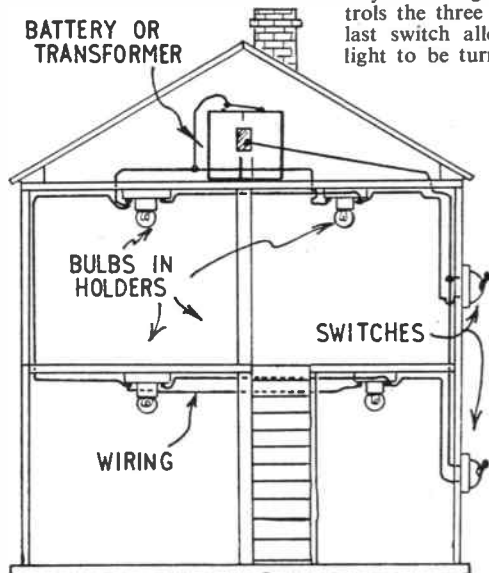


Fig. 7.—Actual wiring of circuit in Fig. 6

Larger circuits

In larger models, railway circuits, etc., more bulbs can be used, especially when current is drawn from a transformer. For example, a 6.3 volt 3 amp radio valve heater transformer, which would cost only a few shillings, would run up to ten 6.3 volt .3 amp bulbs, or twenty 2.5 volt or 3.5 volt torch bulbs.

Other bulb circuits, with switches, are easily added, and the whole can be built up a little at a time, if wished. Fig. 8 shows a circuit with eight bulbs. This would do for a service garage with house. The lights in bedrooms and lower rooms are controlled by switches in the same way as in Fig. 7. Another switch controls the three petrol pump lights. The last switch allows the garage interior light to be turned on or off. All these

show to which part of the model it is connected. For example: bedrooms, lower rooms, pumps, garage.

Interest can be increased by using coloured bulbs, or painting ordinary torch bulbs with transparent oil paint. Various special effects can be arranged, such as a bulb behind coloured paper in a fireplace, or beacon, or searchlights.

When dry batteries have to be used, the type of battery with large cells will be best. If the model is to be run for a long time, and dry batteries are essential, then low consumption bulbs will prove very much more economical. The great difference which this can make will be seen if it is remembered that seven of the 6 volt .04 amp bulbs mentioned would consume only about the same current as one 6.3 volt .3 amp bulb.

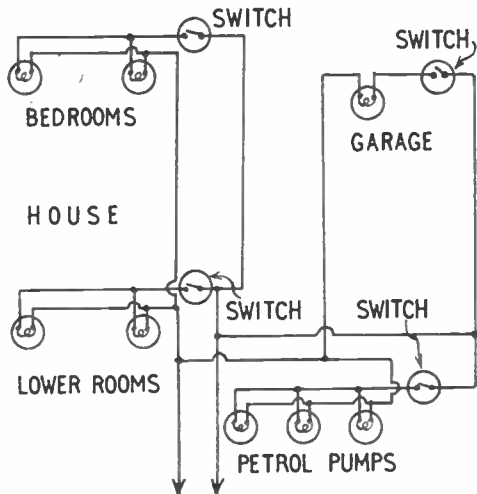


Fig. 8.—Wiring circuit for a model garage

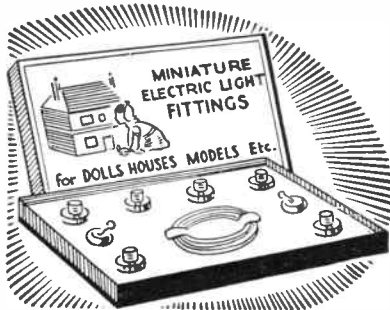
The battery or transformer can often be concealed in the roof. With fairly large models, a garage, shed, power-house, etc., will be available to house this item. A single switch may be wired directly in one battery lead, here, so that the whole model can be turned off by means of it.

With a transformer, the whole model will be switched off when the main switch in the circuit feeding the transformer is opened. Connections at the primary, or mains side of the transformer should be well insulated, to avoid any possible short circuits or shocks. If the transformer has exposed tags or terminals it is a good plan to enclose it in a box, with the lid screwed down, so that the mains side of the circuit cannot be touched. A few ventilation holes should be drilled. Full details for wiring up mains transformers for models will be given later.

separate circuits can be on or off as needed, or all may be on together.

With a large model it is often convenient to group all the switches on a switchboard at some handy point, and to put a neat label near each switch, to

The next article in this series deals with batteries in series and parallel, switching, and controlling and running a model generally.



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MAKING A RECORD HOLDER

SERVICEABLE and inexpensive record holders may be made up with the aid of gummed strip, the completed article being designed to hold any number of records or series as desired.

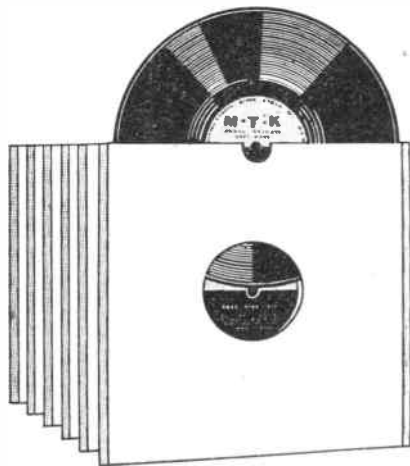
Firstly, individual record covers may be made up easily from thick brown paper or similar material along the following lines —

(1). A sheet of thick paper is cut equal in length to twice the size one way of the record. This is then folded over with the record in the centre to ensure that the finished size will be correct. Leave just a little 'play' for the purpose of withdrawing the record when required.

(2). The two open side seams are joined together and reinforced with a strip of moistened gummed tape. A top cut-out thumb hole is made with a pair of scissors.

(3). The record label is measured and an appropriately cut-out hole is made so that the title is visible. For accuracy, use a compass for this label hole, or fold the cover in half and neatly cut out a semi-circle which will form a circle upon opening out again.

To make up a record holder for, say, six or one dozen records, use the appropriate number of thick cardboard sheets to size, prepared with label holes as explained for the covers, cut out thumb holes and use a suitable width gummed strip for the side bellows of the hinge section. Two or three strips of



tape should be used for greater strength, but it should be remembered that this tape is also made in linen, which is very much stronger.

Most tapes are made in one, two, three and wider widths of various colours, in small and large coils, and may be obtained at stationers, handicraft shops and stores.

In addition to record holders, filing cases, wallets and storage pockets for papers and documents may be made up along similar lines from strong thick

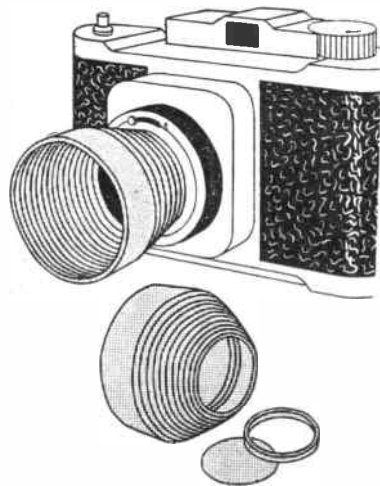
paper or card, and tape for the edge reinforcements.

Where several measurements may be needed, a very pliable form of tape measure may be made from gummed tape. A suitable strip of one foot or a yard, accurately marked off in inches and lettered accordingly may be used to measure circular work where it is difficult to apply a wood ruler. A tape measure is always useful in the tool shed or on the working bench and cutting out table.

Gummed tape does not stretch, and will last for quite a while. It may be stuck down flat permanently to a surface and used to measure off lengths of metal, wood, cloth or other material. A similar marked-out strip of tape may be used for the family height chart, when stuck vertically to a wall. It may be washed off later when not required.

In addition to brown paper kraft and colours in the same series, there are linen grades, transparent paper, and linen types. The transparent types are obviously ideal for repairing torn pages in books, music, notes and documents where a visible mending medium is desirable. The use of the best tape for the job should be considered, the stronger varieties being used where repairs are made to objects and articles in everyday use. Camera and other bellows, for example, sometimes split and here a strong black linen tape which has a good linen finished surface, is best for such repairs.

... and a lens Hood for the Camera



WITH the aid of gummed strip, a very serviceable lens hood and filter holder for the camera may be inexpensively made up in a few minutes. Such items themselves, when purchased, are quite costly.

A suitable length of gummed strip is wound loosely into a coil with a hole in the centre for fitting. The tape is pushed upwards in a telescopic fashion to give the shape as illustrated. The tape is not moistened but merely held firmly in the hands in order to ensure that the correct fitting diameters have been prepared. This is in order to obtain an accurate fitment. The tape may then be carefully moistened at the ends, being held together temporarily with a clip. The lens hood may also be dipped in water and left to dry off. In this way, a really hard fitment will be obtained.

As gummed strip consists of kraft paper made from wood pulp and

animal glue, the two combined when completely immersed in water and dried out, form a hard rock-like substance almost impossible to tear or even bend where tape is used in several ply form.

The circular filter piece is added at the completion of the job. The lens hood may be suitably painted with black or silver paint, or a strip of silver paper may be added to cover the holder thus giving the appearance of a metal fitting. Passe partout picture framing material is made in silver and has an excellent adhesive surface and will readily adhere to the model filter.

A wood mould may be used upon which one may wind the moistened tape to form the lens hood. This is designed to give greater accuracy and precision fitting, and with some practice, this form of coil winding turns out to be quite simple and speedy.

(F.T.D.)

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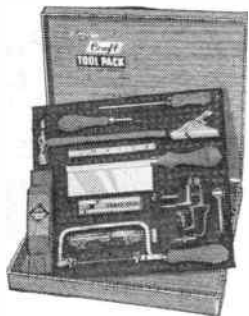
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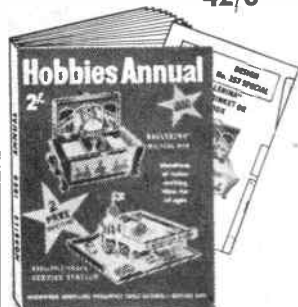
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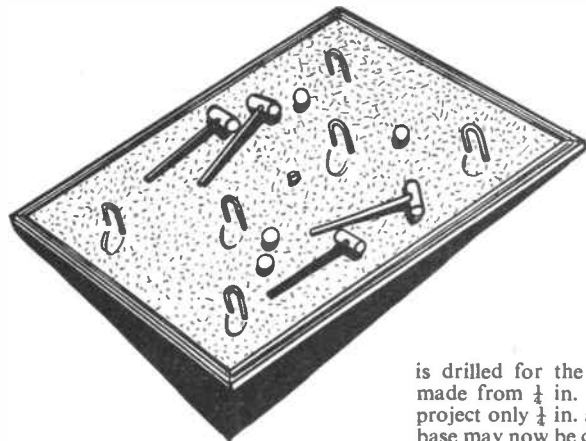
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INDOOR CROQUET GAME



By S.H.L.

YOU may have seen a fine lawn laid out with six iron hoops for the game of croquet, in which you have to drive a ball through these hoops on a set route by means of mallets to a winning peg. We describe here how you can make a similar miniature set for indoor play.

Fig. 1 shows the layout of the six hoops and indicates the route taken by the balls in play, shown by the arrows, i.e. starting at the base and finishing at the winning peg after making a double tour of the hoops.

You will need a piece of plywood or hardboard to represent the lawn, measuring at least 18 in. by 24 in. to give a reasonable playing area but if you wish you may make it much larger if in proportion. It is also advisable to cover this base with green baize or flannel material which will not only provide a smooth surface for play but also retard the speed of the balls, allowing more control. This covering can be attached by a thin coating of glue — an excessive amount will penetrate the material — then fixing half round section all the way round with mitred corners. This covering should not be applied, however, until preparation for the hoops has been made.

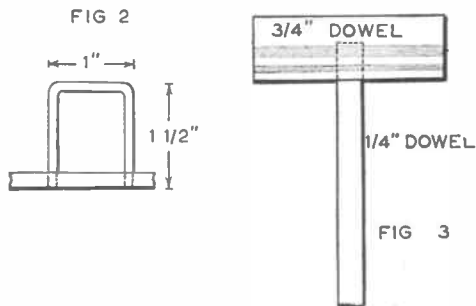
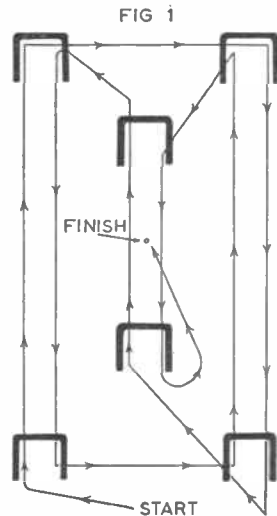
Hoops of wire

Six hoops are made from thin, but strong, flexible wire about $\frac{1}{4}$ in. in diameter. Cut six 4 in. lengths, shaping as shown in Fig. 2 and large enough for a marble to pass through. These wire hoops may be painted white — although the starting hoop should be red.

Mark out the hoop positions on the base as shown in Fig. 1, drilling holes just a little smaller than the gauge of the wire to ensure a tight fit. A further hole

is drilled for the winning peg. This is made from $\frac{1}{4}$ in. dowelling and should project only $\frac{1}{4}$ in. above the surface. The base may now be covered.

The hoops and winning peg are tapped in firmly with a hammer. The ends of the wire should be filed quite smooth.



The only other accessories required are mallets and balls. The latter should be suitably sized coloured marbles.

Fig. 3 shows how to make the mallets. Obtain a 10 in. length of $\frac{3}{4}$ in. dowelling, cutting off into 2 $\frac{1}{2}$ in. lengths to make four heads. Drill a $\frac{1}{4}$ in. hole in the centre of each for fitting a short length of $\frac{1}{4}$ in. dowelling for the handle, which should be approximately 8 in. in length and rounded off at the end. Secure by means of glue.

In our game

Two sides compete, each consisting of one or two players taking alternate turns. Four balls are used, one side using a blue and a black ball, the other

side using a red and a yellow ball. When there are two partners each plays with one coloured ball throughout the game and the game is won by that side which first scores all its points in order.

The object of the game is to score by striking the balls through the hoops by the fixed route to the winning peg — and no point is scored unless the ball passes through the hoop in the correct order. If a successful point is scored the player may take another stroke at the next hoop and it is possible to make a 'break' as in the game of billiards.

If he hits another ball when taking a second stroke he is said to 'roquet' and he may 'croquet' the ball which has been hit. To make this clearer, we should say that he may place his own ball in any desired position but touching the roqueted ball and then hit both balls in any direction and when he becomes entitled to another stroke. He may place his finger on his own ball if it is in a good

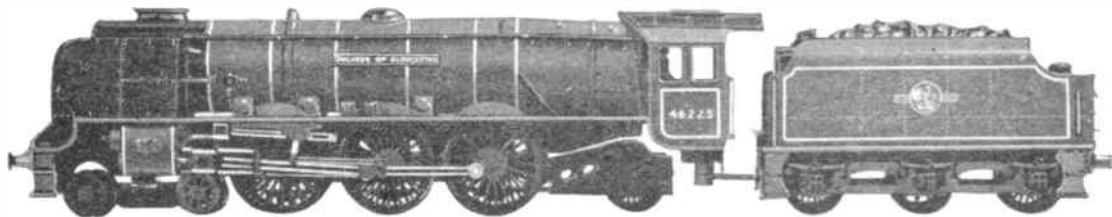
position to shoot at a hoop and the concussion on striking will be sufficient to drive the opponent's ball away. It should be noted that the player must have a shot at the hoop after this manoeuvre.

It will be seen that the player should aim to get in front of a hoop and 'run' it, continuing his turn if successful.

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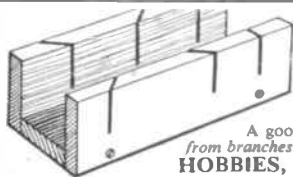
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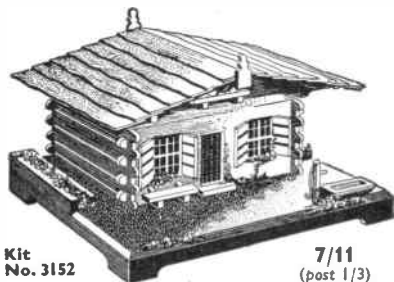


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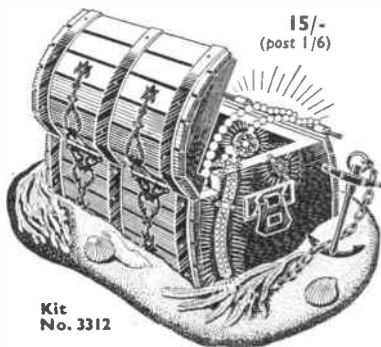
GET A KIT NOW!



Kit No. 3152

7/11 (post 1/3)

SWISS CHALET. Lift the lid to offer a cigarette and it plays a tune.

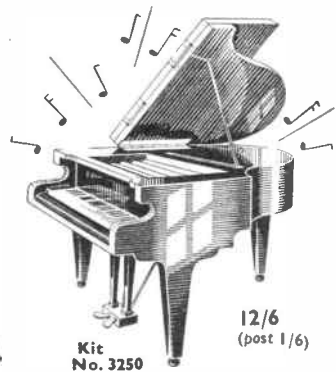


Kit No. 3312

TREASURE CHEST. Kit includes wood, anchor, chain, metal fittings, etc.

Fit your box with one of these tunes No. 1 movement 14/11 (post 6d.)

- B Kiss Me Honey-Honey
- C The Knick-Knack Song
- D Anniversary Song
- N The Bridge on the River Kwai (Col. Bagey)
- O On the Street where you Live
- P Ave Maria de Gound



Kit No. 3250

12/6 (post 1/6)

GRAND PIANO. Kit includes printed keyboard.

Other models detailed in free Booklet

To Hobbies Ltd, Dept. 992, Dereham, Norfolk.

Please send free copy of 'Profitable Leisure' and items detailed.

Kit No.

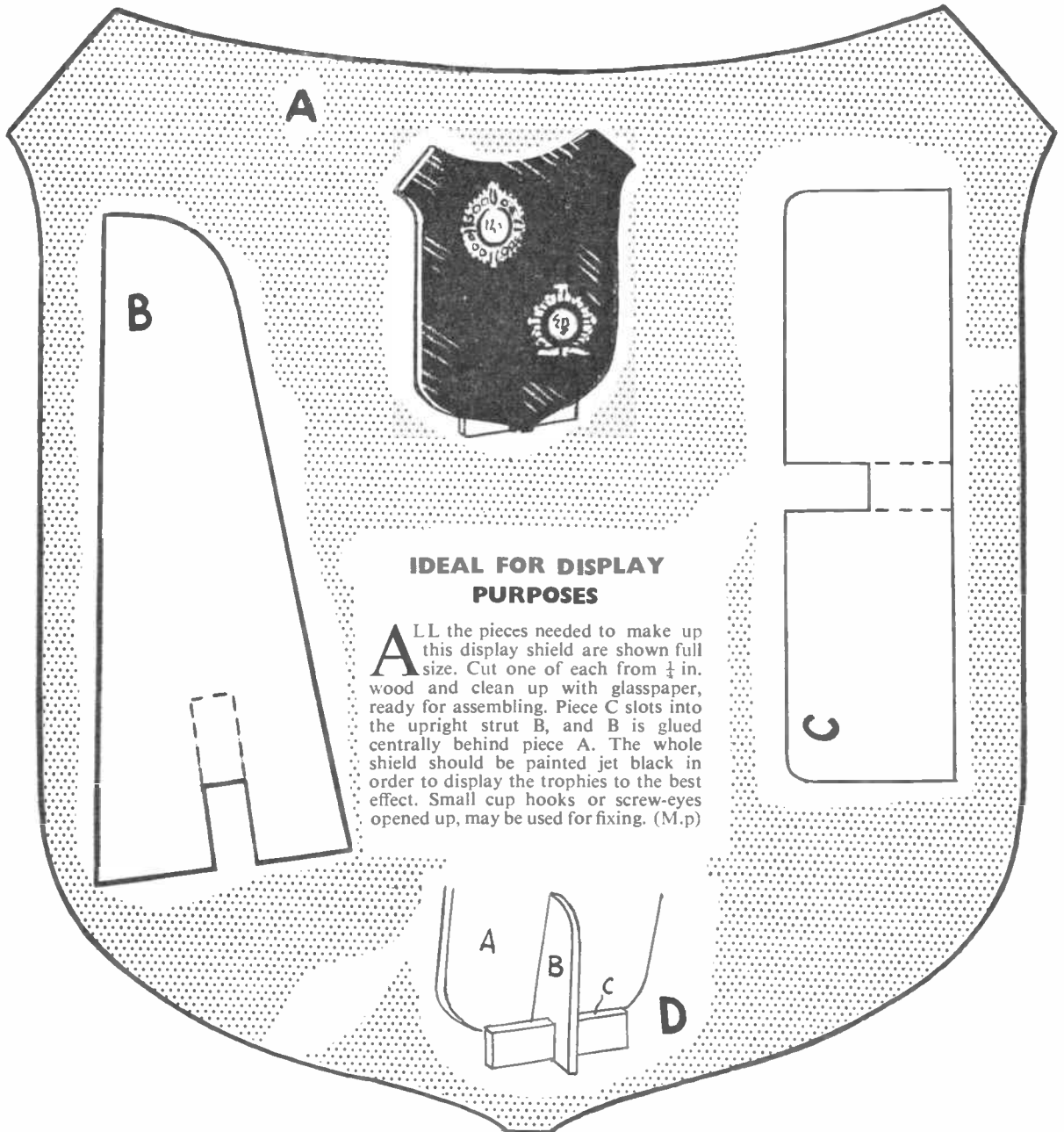
Musical Movement.

Name

Address

P.O. for enclosed.

A SHIELD FOR TROPHIES



IDEAL FOR DISPLAY PURPOSES

ALL the pieces needed to make up this display shield are shown full size. Cut one of each from $\frac{1}{4}$ in. wood and clean up with glasspaper, ready for assembling. Piece C slots into the upright strut B, and B is glued centrally behind piece A. The whole shield should be painted jet black in order to display the trophies to the best effect. Small cup hooks or screw-eyes opened up, may be used for fixing. (M.p)

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