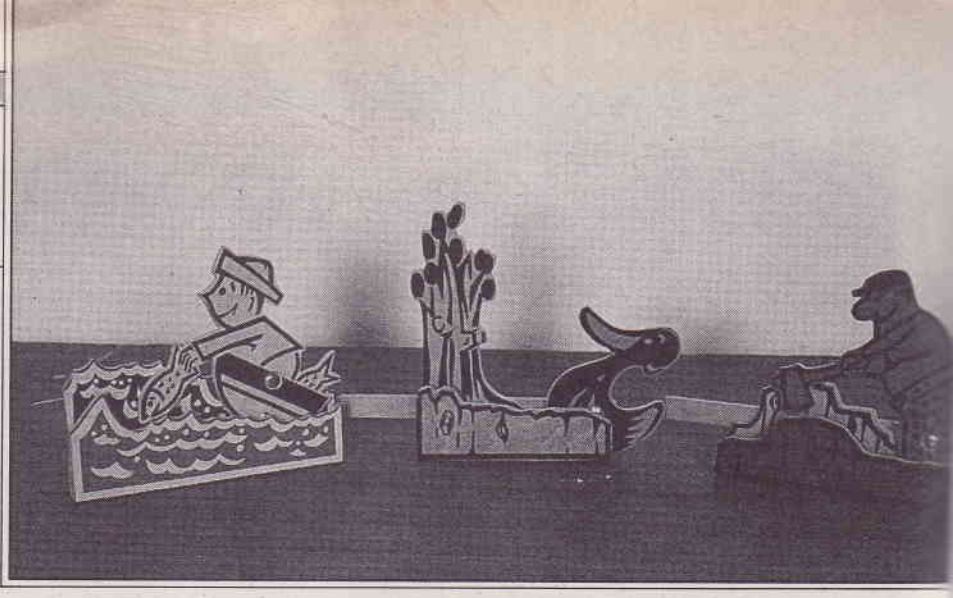


SIMPLE LEVER TOYS

Screen printing is ideal for the limited production of small items as R. Anderson shows how with his ideas for simple lever toys

THESE simple lever toys which are operated by pushing the lever back and forth to make the figure move are fun to make and fun for any small child to play with.

Whilst they can be painted individually by hand painting using Plaka or other non-toxic paints, they do lend themselves to screen printing especially if you think in terms of small scale production.

Whether you use hand painting or screen printing methods you would do well to use 4mm birch plywood and prepare it by applying three coats of Rustin's Colorglaze or similar to the colour of your choice, then lightly sand after the last coat. The figures can then be either hand painted or printed onto the boards and cut out either using a power or hand fretsaw.

Screen printing

This is an easy and inexpensive method of producing toys in small quantities, and most of the screen inks, stains and varnishes can be obtained in small amounts. The printing frame itself can be easily made by any woodworker with a minimum of tools.

The basic principle of screen printing is one of printing through stencils – the stencil being made of thin tough paper, Profilm or Amber film, which is a special stencil paper consisting of a shellac base adhered to a paper backing.

The stencil is attached to a mesh which nowadays is usually nylon as silk is too expensive. Cotton organdie is the cheapest material but this is not as strong. The mesh is stretched drum tight across the screen frame and the stencil is attached to this. Screen ink is pulled across the screen with a rubber squeegee and passes through the cut-out part of the stencil and onto the ply or material being printed.

Making the screen

A suitable size for printing these kinds of toys is an inside frame measurement of 15 by 15in. The base should be Formica coated blockboard or Melamine and must be flat and non absorbant. The frame itself can be constructed of softwood using bridle joints on the corners with through dowels for extra strength.

Frame members should not be less than 1½ by 1½in. as there is a heavy pull on the frame when the mesh has been stretched in place. A rebate ½ by ½in. on the outside of the frame with fillet is used for fixing the mesh in place.

On one side of the frame, a back bar is fixed to hold the frame to the base; this piece is the same section and length as the end of the frame, and is drilled through for fixing to the base with bolts and wing nuts and hinged to the frame with T hinges. Scrap pieces of wood can be placed under the back bar to raise the frame to the correct height for whatever material or thickness of ply is being printed.

Covering the frame with mesh

With scissors, cut the mesh to be about 2in. larger than the frame all round to assist with the stretching. Cut four strips of white card ½in. wide. Now put the frame in the centre of the mesh and staple or pin on the card on the outside of one end of the frame to

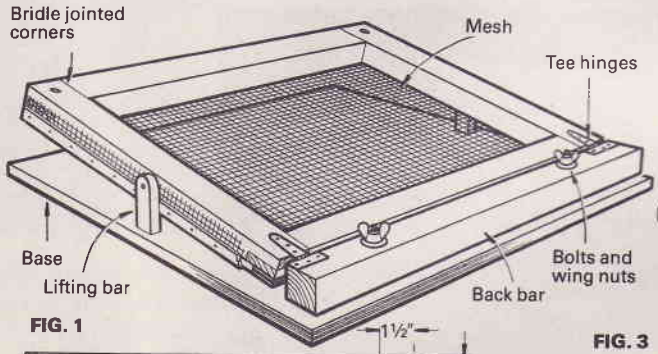


FIG. 1

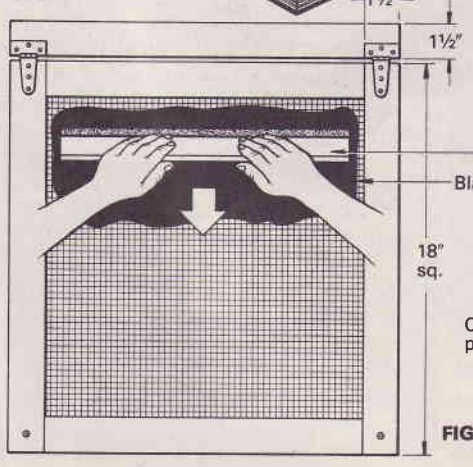


FIG. 2

SQUEEGEE

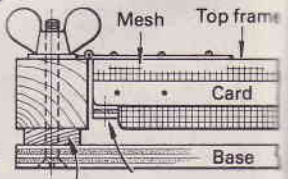


FIG. 3

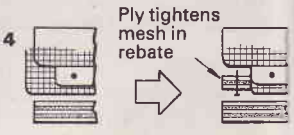


FIG. 4

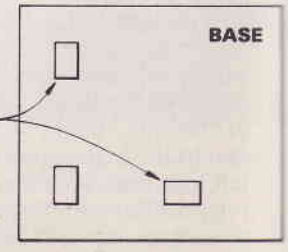


FIG. 5

hold the mesh in place. Repeat on the opposite end stretching the mesh as tight as possible. Repeat for the other two sides.

To further tension the mesh, lay strips of 4mm ply over the mesh where it covers the rebates and nail these down with panel pins. If the mesh is not tight enough then it will give a very poor print.

Preparing for printing

A thick pen or brush drawing is prepared on card, with three simple examples shown. To suit the size of frame we are working with the parts of the toy must be fitted within a 12 by 12in. space. Note that one part of the card at least must have edges at rightangles and that ½in. should be left between each component and the edge of the sheet.

The card is now placed on a drawing board and a sheet of Amber stencil film placed on top, shiny side up, and held firmly in place with drawing pins. The stencil of the toy is cut out with a small X-Acto knife using a No. 16 stencil cutting blade. Note that the film is not cut through to the backing sheet, but only through the surface with the cut portion then pulled out. It is worth experimenting on waste stencil film until the knack is acquired. The cut stencil is left on the backing film and laid over the drawing on the base of the screen frame, lined up with three stop marks. The top of the frame is lowered onto the film and drawing, and a household iron, adjusted to silk heat, is ironed over the surface until the stencil film adheres to the mesh. The screen is then lifted and the backing paper removed from the stencil. The screen can now be lowered again and the iron applied, this time with sheets of newspaper underneath to further fix the stencil. Bare parts of the screen are masked with thin paper.

Into production

To make 12 toys you will need four sheets of 4mm ply 12 by 12in. Ensure that each has a properly planed rightangled corner, the same as the drawing. Place the four sheets together, clamp them and then hold together with masking tape. The clamp is removed and ¼in. holes drilled in each corner for dowel locating pegs to ensure that they will line up. Mark the boards on the back so that the assembly sequence can be maintained.

To prepare for the printing, lightly sandpaper the face of each board and then coat with a stain sealer such as Rustin's Colorglaze. In this case as the main ink we are printing with is black, the colours of the stain should provide a good contrast (ie yellow, red, orange or light blue). Repeat the finishing with a further two coats and then lightly rub down with steel wool when dry.

Place the board on the screen base so that the mesh is ⅛in. above the board to be printed. Lower the screen fame, pour in a small amount of black screen ink at the back of the frame, then pull the rubber squeegee through the ink and over the stencil. The ink will pass through the cut part of the stencil leaving a clear image on the surface of the board.

When the ink is dry, after approximately one hour, a coat of non-toxic interior varnish can be applied.

When the varnish is dry, reassemble the boards using the dowel locators, tape the edges with masking tape so that the boards are held tightly together, and it is a simple matter to drill the rivet holes and cut out the toys four at a time using a hand or powered fretsaw.

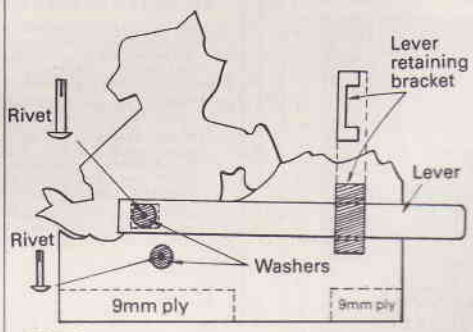
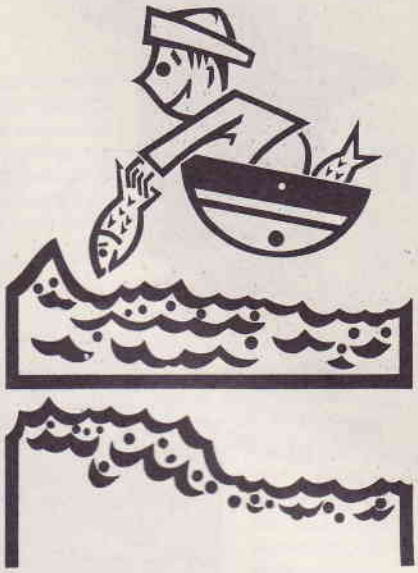


FIG. 6

After cleaning up the edges, rivet the lever to the back of the fisherman (woodman or woodpecker) with a 4mm spacer on the back of the figure. Then rivet the figure to the back of the toy, again using washers at the pivot point.

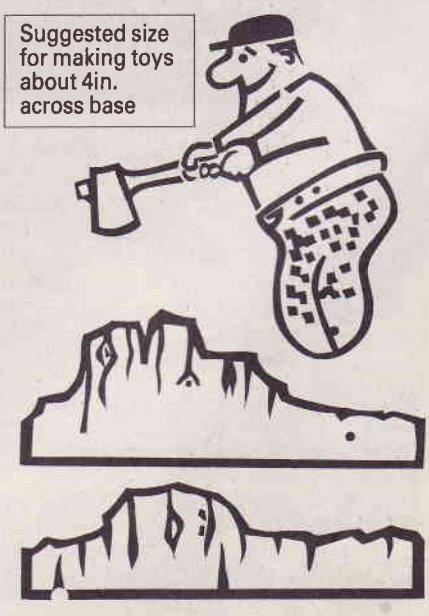
A retaining bracket is fixed at the back to locate the lever and this is simply glued in place with the lever slotted through. The front fascia of the toy can then be glued to the back using small peices of 9mm ply as spacers. It is then only necessary to clean up the bottom surfaces to make sure that the toy sits well on a flat surface.

These toys are simple to make and are excellent Christmas stocking fillers or small novelty items. Colours can be varied tremendously and you can make your designs as simple or as complex as you like.



EXAMPLE 1 FISHERMAN

EXAMPLE 2 WOODPECKER



EXAMPLE 3 WOODCUTTER