PULL-ALONG TEDDY

This lovable teddy has taken to the road in a big way and is off to the woods for a picnic. Why not make one or two to go with him from this clever design from Alan and Gill Bridgewater.

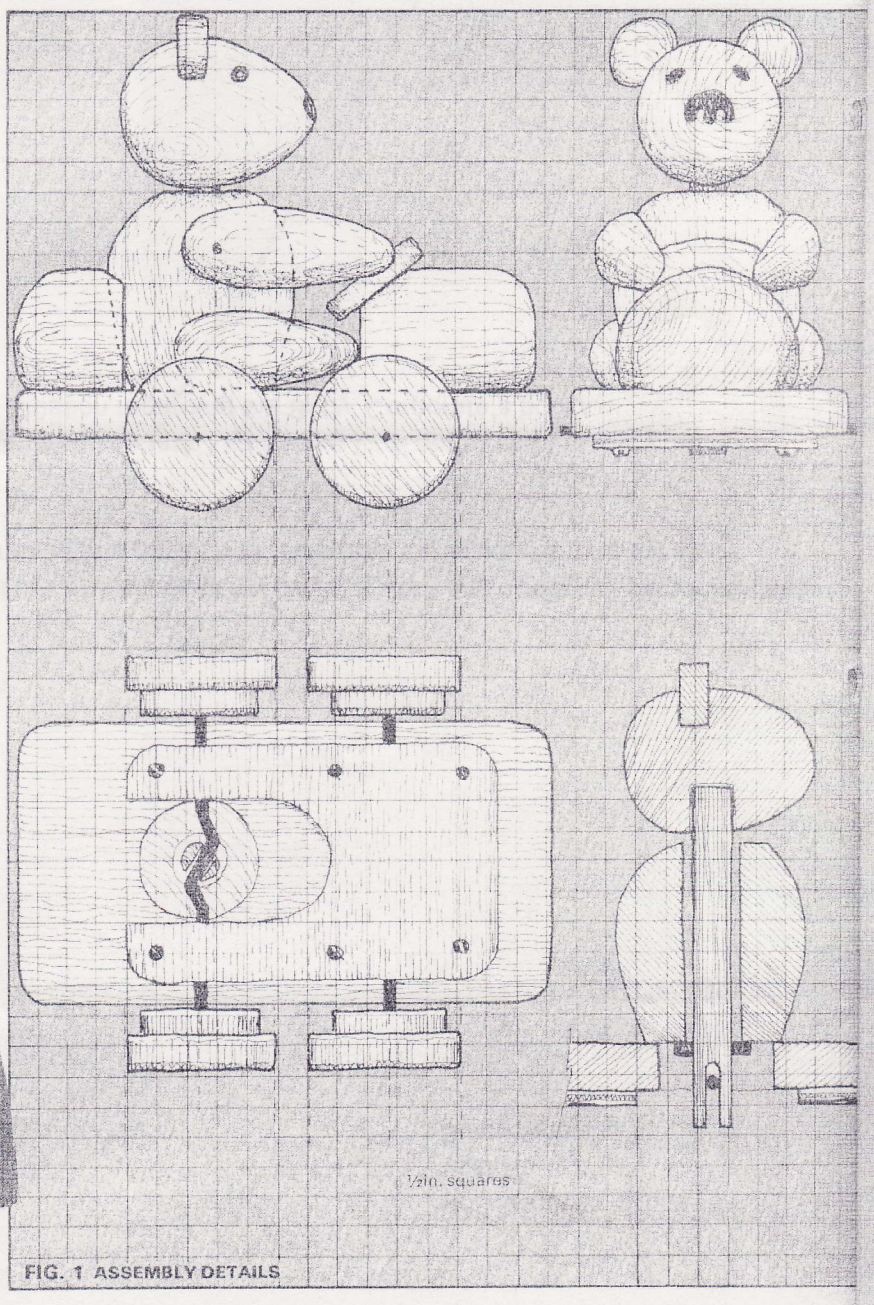
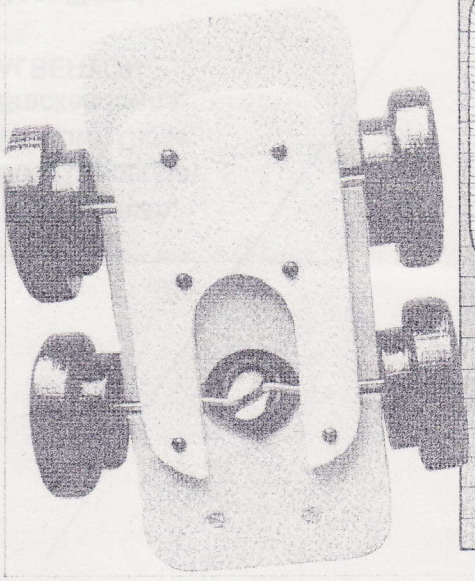


FIG. 1 ASSEMBLY DETAILS



WHEN you have drawn the designs up to size, and when you have established good clean workable profiles of the envisaged turnings, pin all the designs and drawing up on the wall and clear the workshop ready for action. Now take the length of 3 by 3in. square section wood and check it over just to make sure that it is free from splits, dead knots, stains and waney edges.

Find end-centres by drawing crossed diagonals on the square cut ends of the wood and turn down to a cylinder in the normal way.

Turning the profiles

When you have turned off the rough, set the callipers and turn the wood down to a smooth 2½in. diameter. Take your pencil, ruler and dividers and step off all the necks and hollows that go to make up the design of the various turnings. Working from left to right along the wood, mark off: the five main wheels (that is four wheels and one for luck); the steering wheel; the two ears; the two sausage-like forms for the limbs; the two dome-end forms that go to make up the boot and bonnet of the car; the bear's body; the five brake cylinder discs (four and one for luck); and the egg-shaped head.

When you have stepped off along the cylinder all the widths, then take the parting tool and the skew chisel and cut-in a series of pilot cuts or depth guides. Work along the wood establishing all the forms. Use a gouge to clear away the bulk of the rough and

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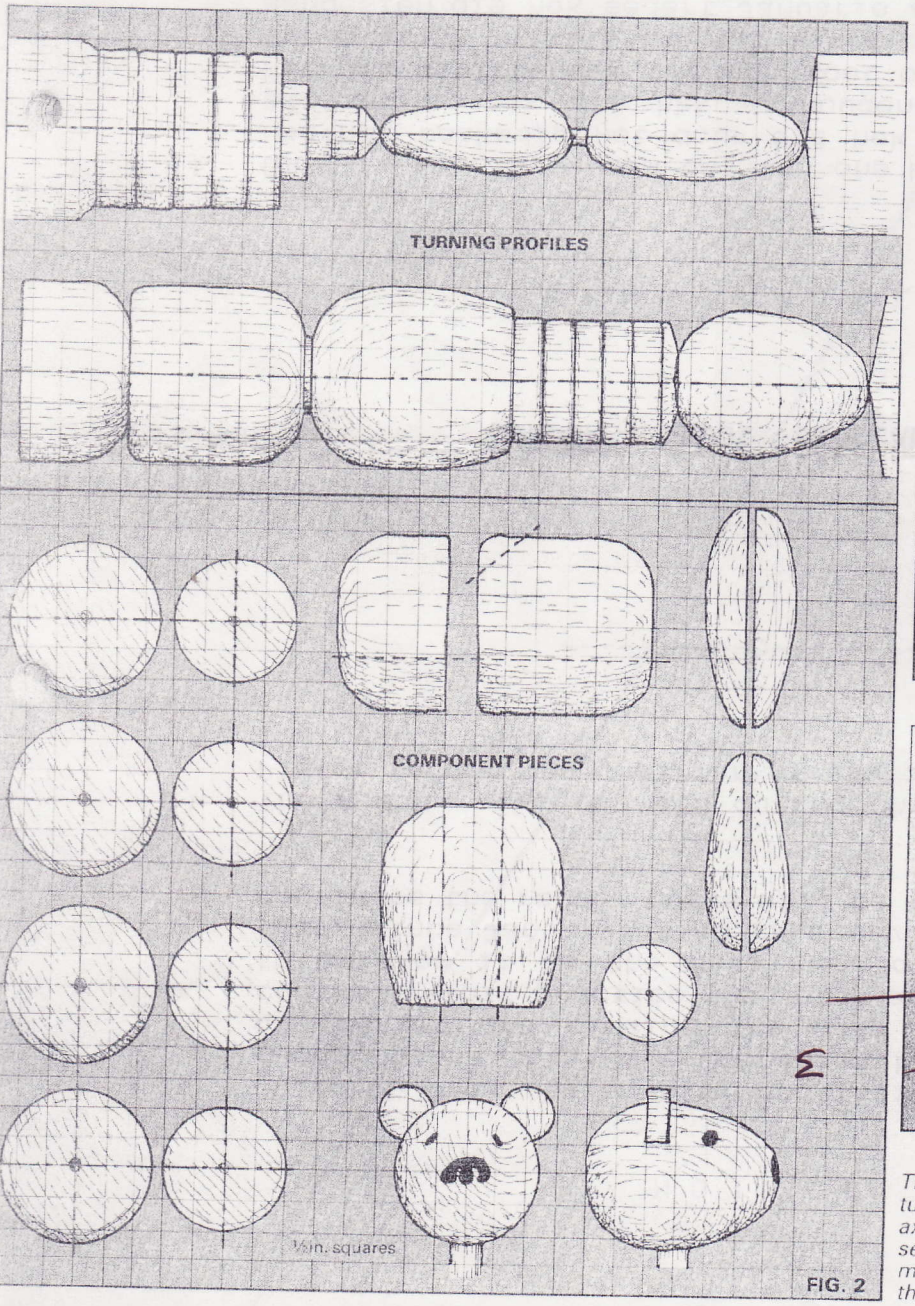
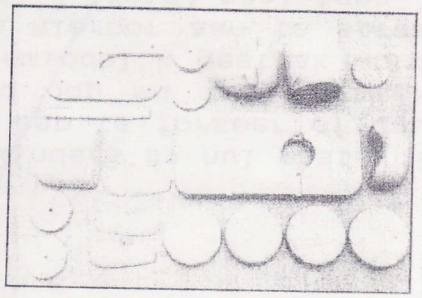
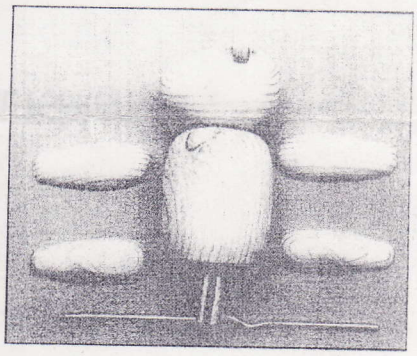
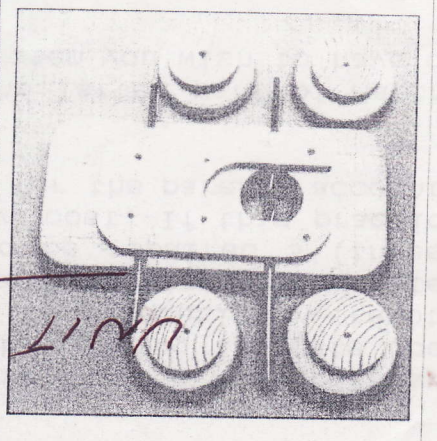


FIG. 2







The three pictures above show the turned parts along with the base and axles ready for assembly. Follow the sequence in logical fashion making any minor adjustments as you go. Remove the bear before beginning the painting.

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then use the skew chisel to take the wood to a fine finish. Be sure always to work 'downhill' on the curves. Hopefully you won't have to use sandpaper, but just in case you do, settle for a swift rubbing down with the finest grade – be careful that you don't overdo the sanding and lose your edges.

Finally, when you have achieved all the dips, sweeps and curves that go to make up the various forms, remove the wood from the lathe.

Making the bear

First, run the turning through the scroll saw and very carefully cut the wood down into its component parts. Take the turnings that go to make up the bear and put the rest to one side – you need the egg-shaped head, the dome-topped body, the two sausage-like turnings and the two little discs that go to make up the ears. Now, being very careful that you don't make a mess up of the wood or your fingertips, take the arm and leg turnings, and then run them through the scroll saw. There's no easy way to do this – certainly you could make a little V-block cradle or jig to hold the wood while it is being sawn, but really its best to pencil in the line of cut and then run the wood through the saw and cut by eye. It is a little bit tricky, so take your time – see that the wood is well supported, and make sure that your attention doesn't wonder. When you have cut the two little turnings down into four flat-faced half-spindles, sand the sawn faces down to a smooth finish.

Take the 'body' turning, swiftly rub the base down to a level finish, and mark in the top centre point. This done, take the drill and the 5/8in. bit and run a hole straight down through the turning.

Fitting the ears is a bit finger-twisting, so be warned, it requires a straight eye and steady hands. First mark in on the egg shaped head the position of the neck dowel, the eyes, the nose and of course the two ears. Bearing in mind that the ears are a little over 1/4in. thick and about 1in. in diameter, aim to sink the ears into the head to a depth of about 3/8in. You won't go far wrong if you reckon on the slots being about 3/4 to 7/8in. long. Now, just as you might cut in a mortice, use the saw and a small chisel to scoop out the little part-disc holes. Best to mark the ears 'left' and 'right', and then to cut each hole to fit. Support the head in one hand, and remove the waste with little scooping cuts.

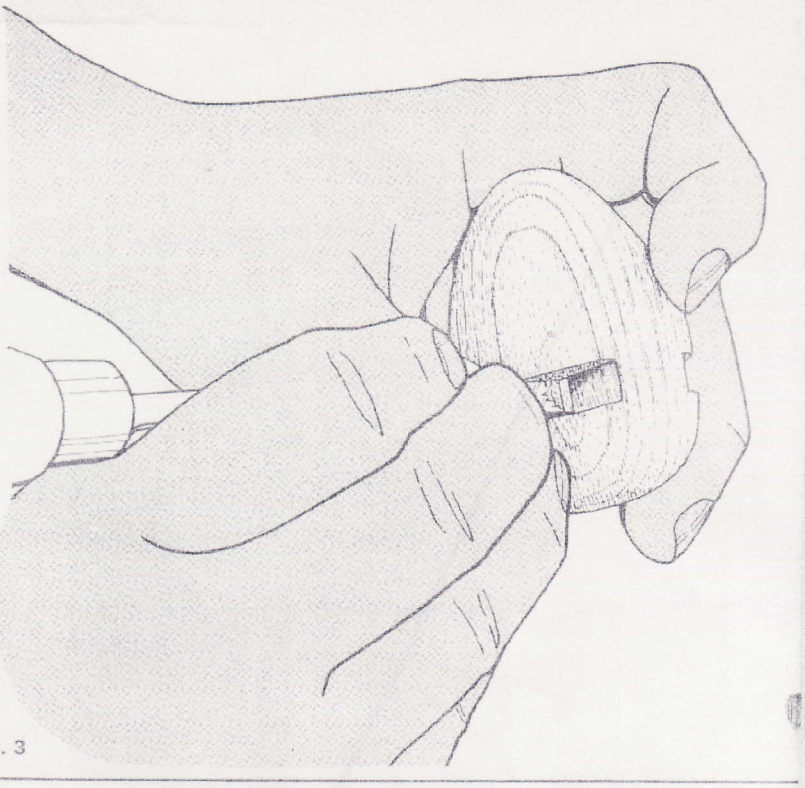


FIG. 3

PULL-ALONG TEDDY

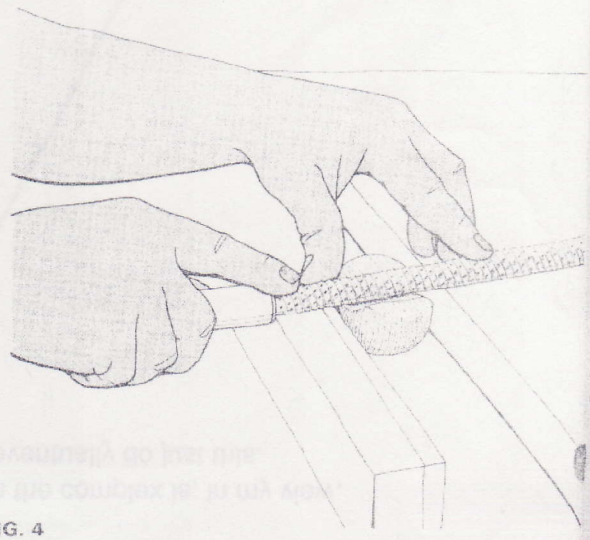


FIG. 4

Building the chassis

First cut the 3/4in. base slab to size, use the compasses to mark in the quarter-circle corners and then use the scroll saw to remove the waste. This done, mark in the position of the body, the through-body 'Z' crank hole and the axle slots. Now, have a quick look at the working drawings and see how the bonnet and boot turnings need to be cut and worked. Note how both turnings need to be sliced along their length so as to give them a flat base, how a slice is taken off for the steering wheel seating, and how a scoop is taken off for the back-of-bear seat rest. It's all pretty straightforward. When you come to cutting the back-of-bear scoop, support the wood end-up in the jaws of a vice and clear away the waste with a gouge and a Surform rasp. Aim for an easy wrap-around, smooth curved form that reflects the shape of the bear's body.

Set the car bonnet, the bear and the boot on the base slab, move the pieces around for best effect and then mark in their position with a pencil. Take the drill and the 1/8 or 3/16in. bit and run screw-fixing holes through the base. Reckon on having two screws for each of the three components. Run a pilot hole through the marked out crank circle and use either a large machine bit drill or the scroll saw to clear away the waste. Bearing in mind that the hole needs to be big enough to allow

FIG. 3: *Carving the ear slots in the teddy bear's head.*
FIG. 4: *Shaping up the back seat with a Surform.*

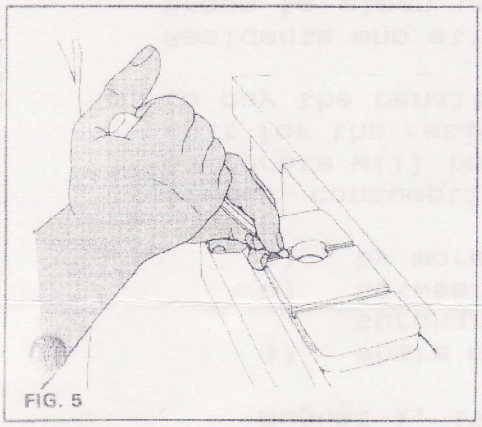


FIG. 5

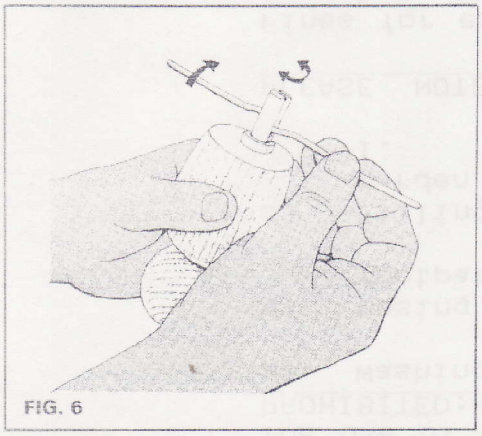


FIG. 6

FIG. 5: *Carving the axle channels in the base unit.*
FIG. 6: *Test that the pivots move by rotating the axle. It is important to achieve a fairly free movement of the axle to give an easy action to the head.*

the crank to turn, and yet smaller than the base of the bear, aim for a hole diameter of about 1¾in. This done, set the base bottom-up in the vice, and use a saw and a ⅛in. gouge or chisel to cut the two axle housing channels. Make sure that the back axle channel runs right across the centre of the crank hole.

Putting it together

Start by screwing the bonnet, bear and boot onto the base slab. Now take the steering wheel and fix it in position on the angled dashboard area – you can use glue and a peg, or a brass dome-head screw. When you come to fixing the bear's arms and legs, aim to have the paws set hard up against the car and the steering wheel. The sawn faces of the limbs are best fixed so that they sit flat against the bear. If needs be, use a chisel and sandpaper to cut flat limb-seatings on each side of the body. Fit and fix the limbs with glue and ⅛in. pegs.

Glue the neck dowel and the ears into the head and slide the neck shaft down through the body and base. Cut the end of the dowel so that at least ½in. sticks out and down through the crank hole. Now remove the neck dowel, mark up about 1¼in. from the bottom of the shaft, and use either the scroll or fretsaw to cut a 3/16in. wide by 1¼in. long crank slot.

Glue and pin the brake drum discs to the inside faces of the wheels. Drill ⅛in. diameter axle holes through the centre of the drums and run them about half way through the thickness of the wheel. Now, with the car set base-up in the vice, slide the bear's neck shaft into position and hold it in place with a rubber or plastic retaining ring – I used a ⅛in. thick slice cut from the end of a plastic washing machine hose. Slide the ring down over the slotted end of the shaft and push it through the crank hole and hard up against the underside of the bear.

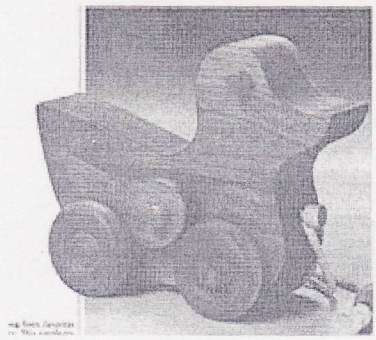
Use a pair of pliers to cut the axle rods to length and to shape the 'Z' crank, and then test the movement of it, making sure it runs freely.

Finally, glue and push fit the wheels on the axles, set the rods down into their channels and screw the plywood baseplate into position.

Painting and finishing

When the glue is set, and when you have variously adjusted the shaft slot and the shape of the 'Z' crank so as to achieve the most easy and efficient head movement, clean up all the dust and debris and retreat to the area that you have set aside for painting. Remove the rubber shaft retaining ring, unscrew the bear and put it to one side. Now, bearing in mind that acrylics become touch-dry in about 15 minutes, paint the car bonnet, base and boot red, the steering wheel green, and the wheels blue. Lay on several coats. When the paint is dry, fit and fix the bear and the drive shaft back into position and paint in the small details – the nose, eyes, the two white headlights and anything else that takes your fancy.

Finally give the whole workpiece a couple of coats of varnish, fit the pull cord and the toy is finished.



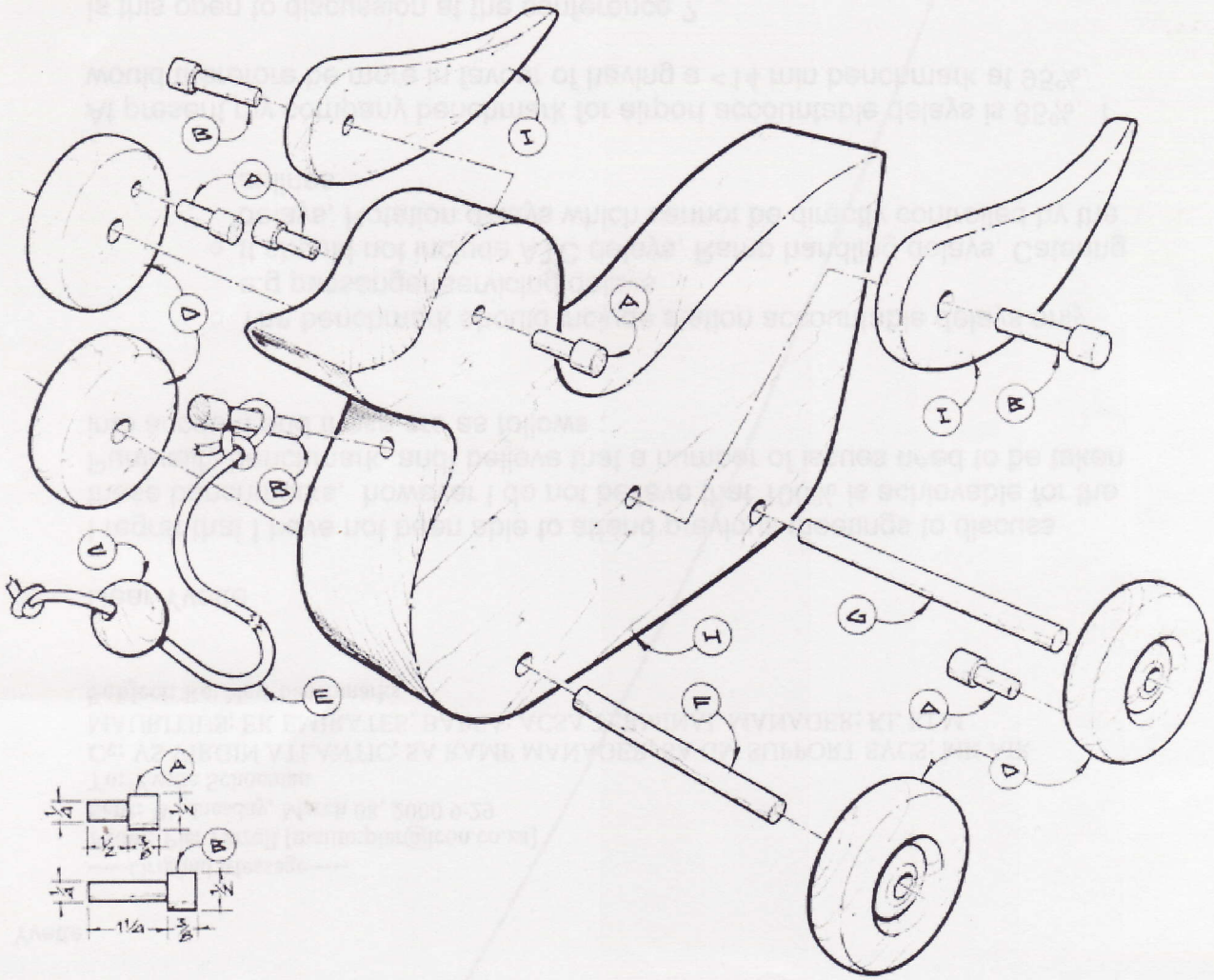
Project 19247EZ:
Duck Pull Toy

Pull toys have long been favorites with the small fry. This simple-to-build duck rolls along easily on four large wheels, with an up and down wing motion generated by offset pegs mounted on the rear wheels. Our duck is made from cherry but most any wood can be used. Maple and birch are good choices because they are hard. You can also use pine but it will not be as durable because it is a soft wood.

Duck Pull Toy Materials List

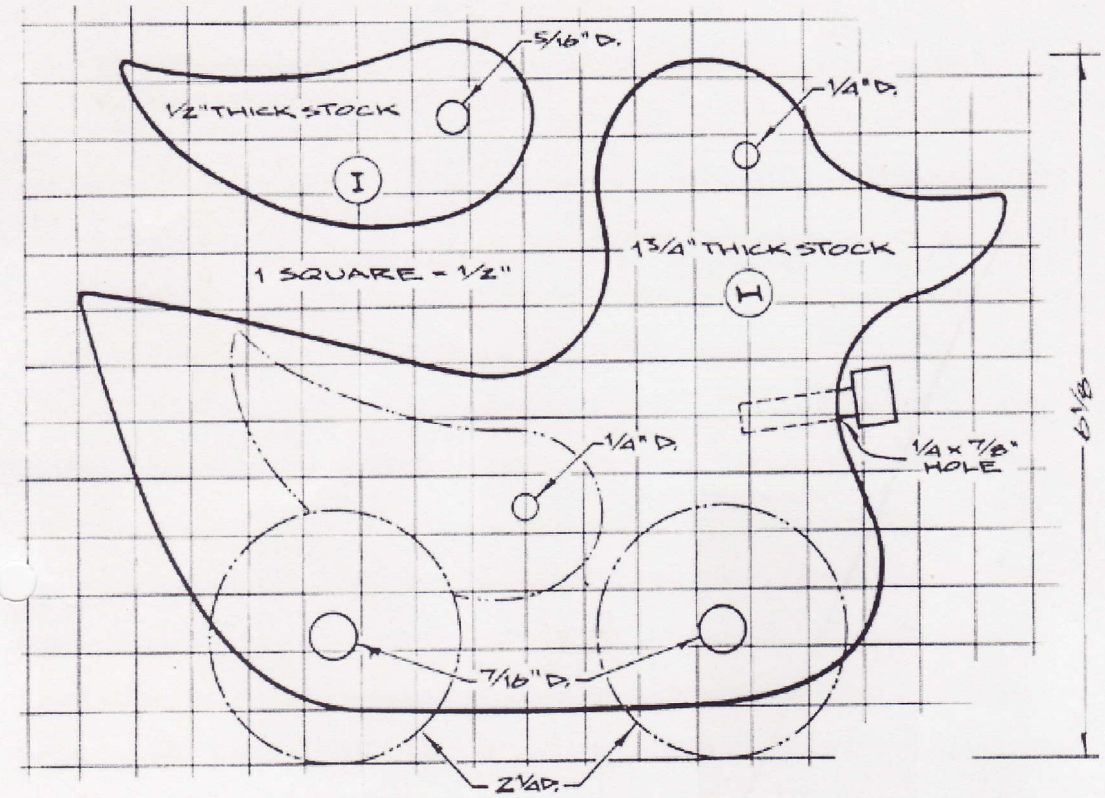
Part	Description	Size	No. Req'd
A	Short Peg	As shown	4
B	Long Peg	As shown	3
C	Ball	1" dia.	1
D	Wheel	2-1/4" dia. x 3/4" thick	4
E	Pull Rope	7/32" dia. x 24" long dowel	1
F	Front Axle	3/8" dia. x 3-3/8" long dowel	1
G	Rear Axle	3/8" dia. x 4-5/16" long dowel	1
H	Body	1-3/4" x 5-3/4" x 8-1/4"	1
I	Wing	1/2" x 1-11/16" x 3-5/8	2

Duck Pull Toy Complete Schematic



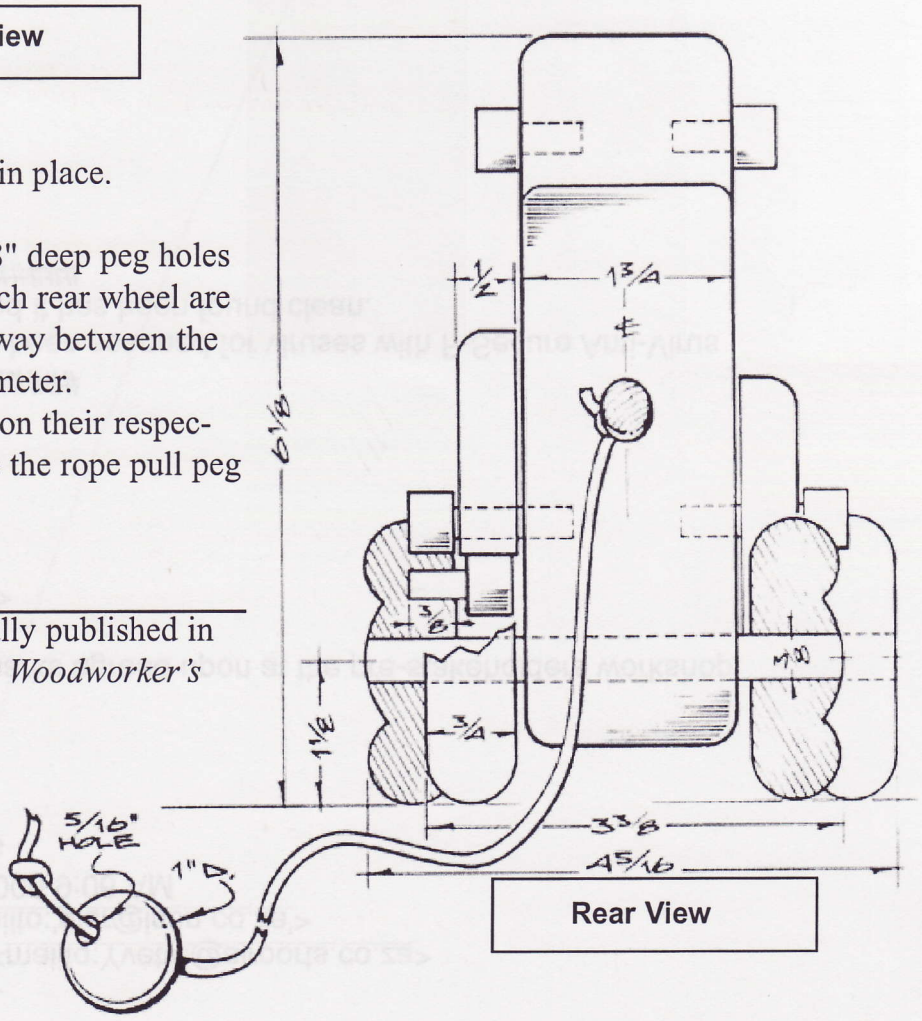
Duck Pull Toy Step-by-Step Instructions

1. Lay out the grid patter, as shown on a 1-3/4" board to make the body (H) and wings (I).
2. Transfer the duck and wing profiles.
3. Use the band saw, saber saw, or jig saw to cut the profiles out.
4. Use the band saw to resaw the two 1/2" thick wings from the wing cutout.
5. Final sand the duck body and wings.
6. Use glue and clamps to assemble the body and wings.
7. Make the pegs (A and B), the ball (C), the wheels (D), the rope (E), and the axles (F and G) as shown.
8. Drill the various holes as indicated to accept the pegs and axles to begin final assembly.



Side View

9. Glue the eye pegs in place.
10. Mount the wings.
11. **NOTE** that the 3/8" deep peg holes on the inside of each rear wheel are located about midway between the axle and outer diameter.
12. Mount the wheels on their respective axles and glue the rope pull peg in place.
13. Leave unfinished.

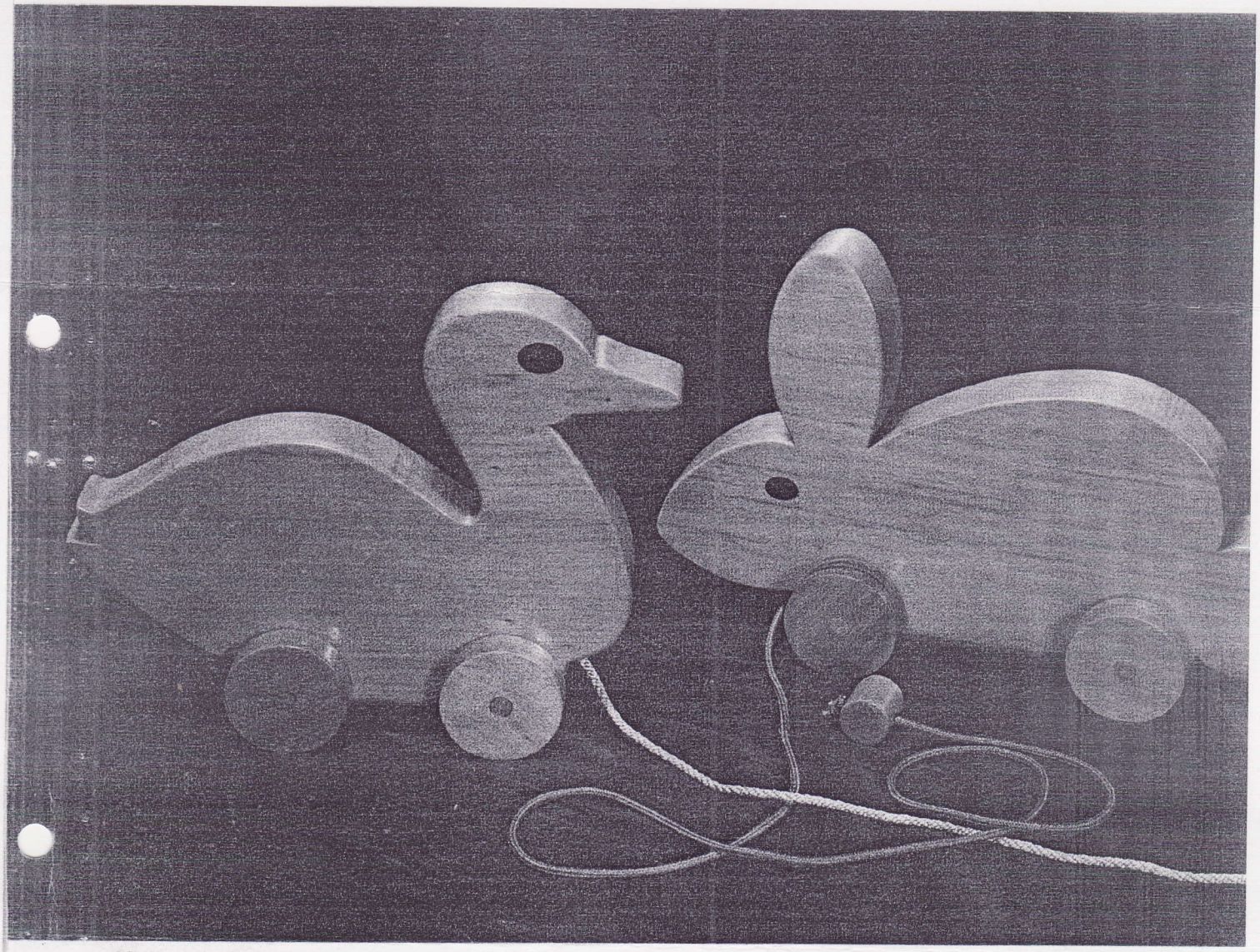


Rear View

These plans were originally published in Volume 9, Issue 6 of *The Woodworker's Journal* (Nov./Dec. 1985, pages 48-49).

PULL ALONG TOYS

There is no limit to the types of animal which you can model for these toys. For these two, I have chosen quite substantial timber, as this helps with their stability, but you can use any piece you have available.

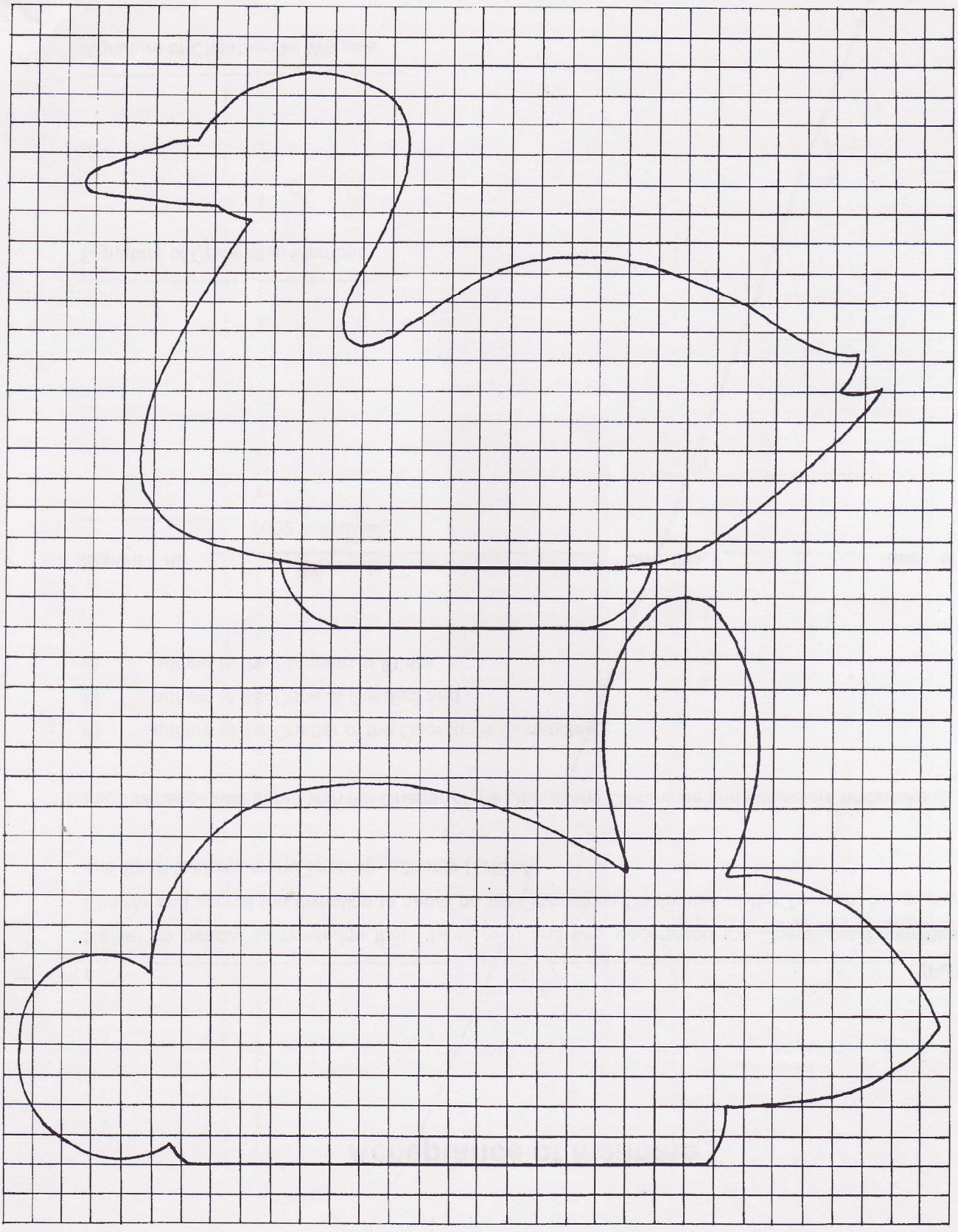


Mind yourself, ducky!

Shown here are drawings of the animals I used. Each one is half full-size. Use graph paper to reproduce the drawing to the size you require.

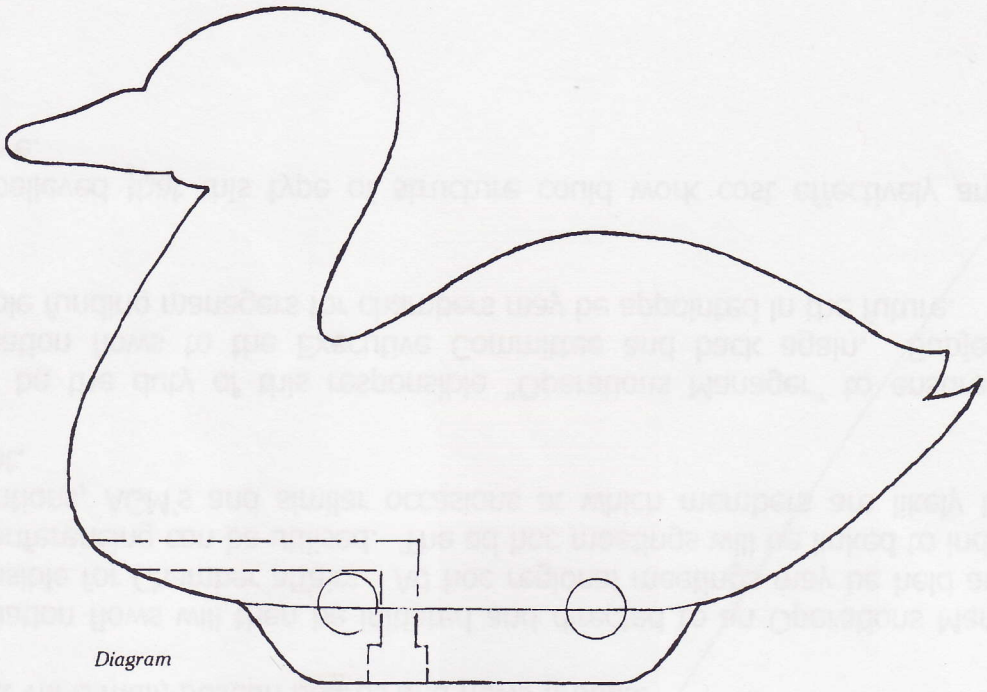
DIAGRAM (see page 42)

Body of toy. Draw out the animal shape you require on graph paper. Cut out the shape and place it on the piece of timber, draw around it, and cut out the shape with a coping saw. If you possess an electric bandsaw, numerous intricate shapes can be cut quickly and accurately. When the shape is cut out, mark and drill the holes for the axles. Ensure that the holes are drilled vertically. The holes should be 1in (25mm) from each end, ½in (12mm) from the bottom and ⅜in (10mm) in diameter. Drill the hole for the pull cord in the centre of the front of the body 1in (25mm) from the bottom and ¼in (6mm) in diameter and to a depth just beyond the axle hole. Then, at right angles to it, drill a ⅜in (10mm) hole in the bottom of the base to join up with it. Enlarge this hole to ⅜in (10mm) and to a



MATERIALS FOR PULL ALONG TOYS

1. Body of toy, timber: 13 × 8 × 1½in (330 × 200 × 37mm)
2. Wheels (4), timber: 2¼ diameter × ⅝in (55 × 15mm)
3. Axle (2), dowel: 2¾ × ⅜in diameter (70 × 10mm)
4. Handle dowel, dowel: 1 × ⅞in diameter (25 × 22mm)
   Length of Cord



Diagram

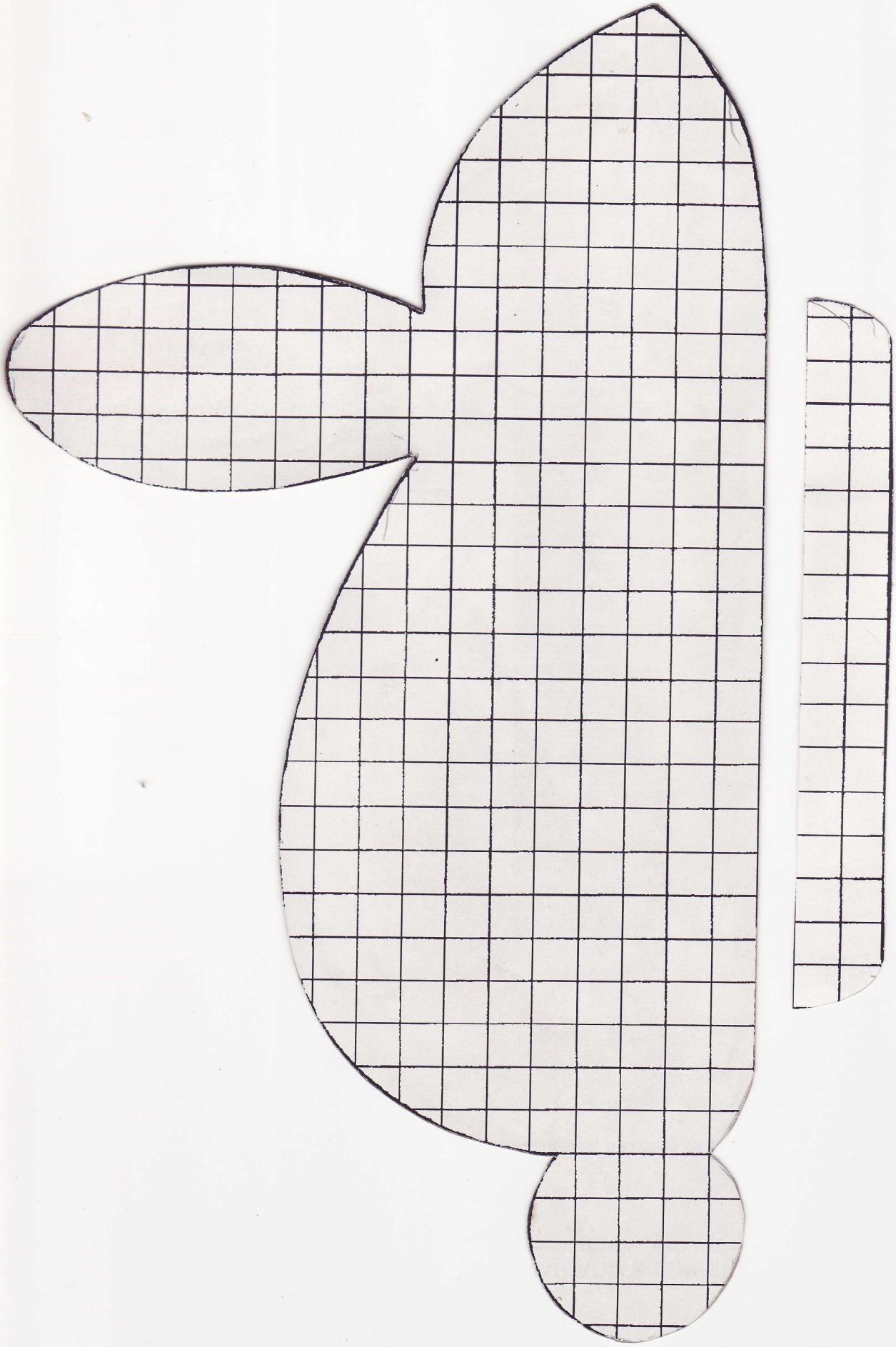
depth of ¼in (6mm). This recess will house the cord. Ensure that this hole does not interfere with the axle hole.

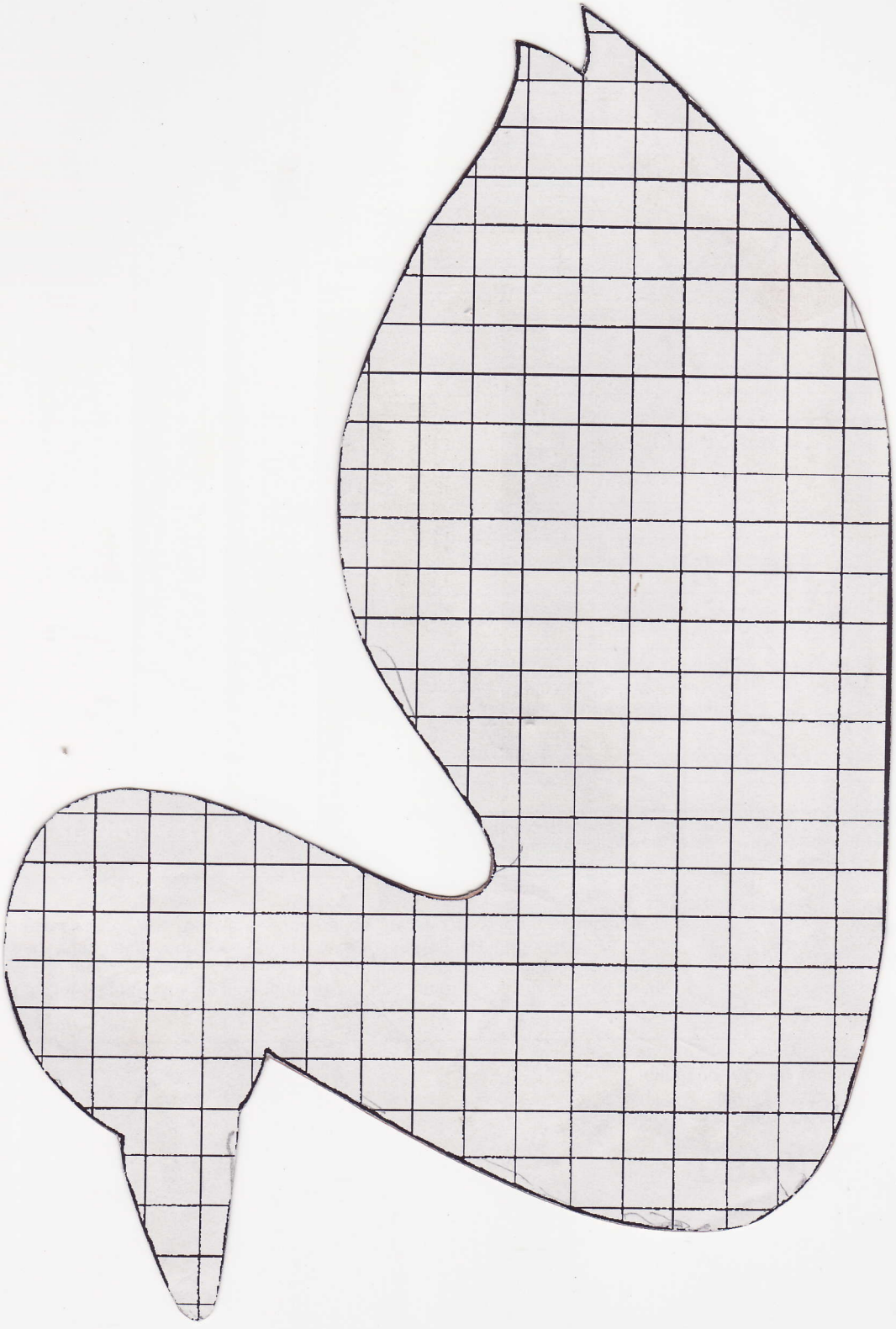
With a smoothing plane, chamfer or round off the bottom edges of the body. Cut the four wheels (2) with the hole saw and the two axles to length (3).

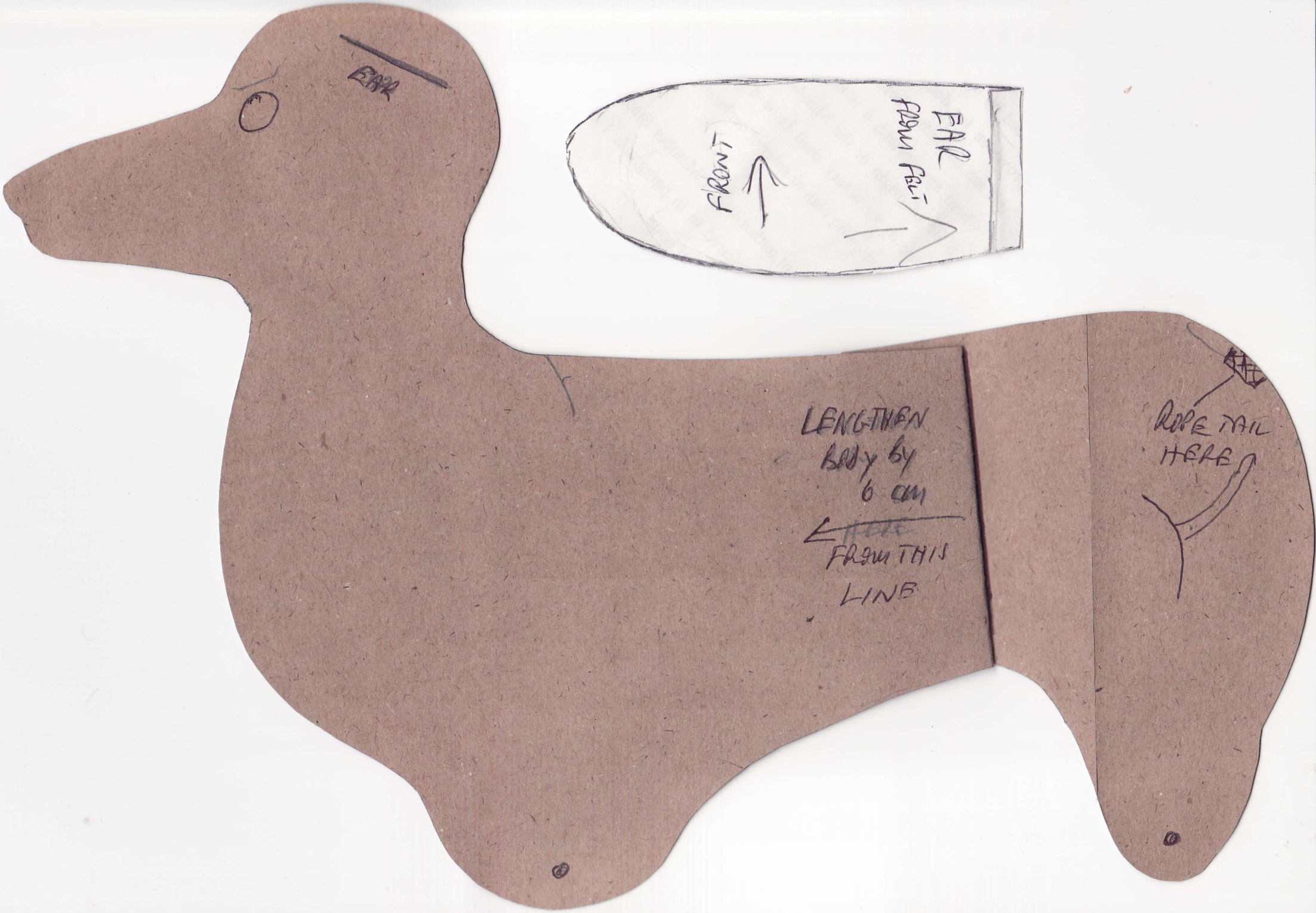
Glue one end of an axle in position, with the end flush with the outside edge of the wheel. Insert the wheel in the axle hole and glue the second wheel into position. Ensure the wheels turn freely. Repeat this operation with the second axle. It is advisable to paint the body of the toy before the wheels and axles are finally fitted.

To attach the cord to the toy, insert a piece of soft wire in the hole in the front of the toy and work it through to the base. Tie a double knot in one end of the piece of cord, and fasten the other end to the piece of soft wire. Pull the wire through with the cord attached. The double knot will not allow the cord to be pulled right through and the recess in the hole will hide the knot. For easier grip, cut a length of dowel (4), drill a ¼in (6mm) hole through its centre, and thread the end of the cord through it. Tie a second double knot to prevent the dowel slipping off.

Sand down the body of the toy well and round off all the edges. Depending on what timber you have used, you can either varnish to give a nice wood finish, or paint to the colour of your choice.



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