

Instructions to Build a Billy Cart

Introduction

A billy cart is a four-wheeled platform that you can ride down hills. There is a pad for sitting on and you steer it with your feet. Every kid I knew when I was young made his own billy cart and we would race them or ride them in long trains. I think it must be instinctive for kids to make billy carts because all kids seem to be able to build them without instruction.

A billy cart is not so much a toy and it is not really mechanically-powered either (although, I suppose you could say it is powered by gravity). But I decided to include it on these pages because this is a design that I wish I had known about when I was a kid. The novelty of this design is that it uses ball bearings for wheels rather than the usual salvaged pram or lawnmower wheels. The fact that the wheels are ball bearings means that they will roll with little friction. And they are fun because ball-bearing wheels make a lot of noise on asphalt or concrete. But by far the biggest advantage is that the ball bearings skid on asphalt very easily. With only a little speed you can push the steering to lock one way and cause the billy cart to go into a spin. Mid spin you can turn the steering to full lock in the other direction and the billy cart will complete a full 360 degree spin.

I have written these instructions from memory. Unfortunately, I won't be building one myself to verify the design. The reason is that I am now living in The Netherlands and there is no point in building a billy cart when there are no hills to ride it down. However, there is nothing special about a billy cart design so I am confident it will work.

What You Will Need

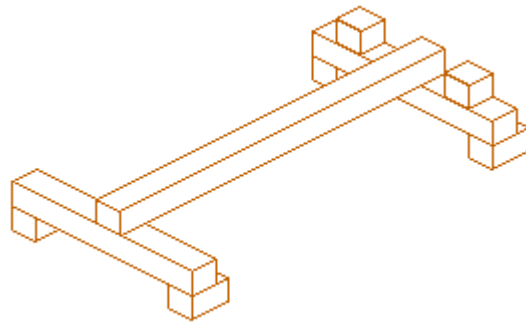
- three metres of building lumber (say, 50 X 75 millimetres (mm))
- a piece of 18 mm plywood about 400 X 350 mm
- a handful of 40 mm flat-head nails
- a handful of 80 mm flat-head nails
- four old, working ball bearings approximately 50 mm (or greater) diameter. You should be able to get these from a car wreckers or a mechanic.
- one 120mm long, 9mm thick bolt, with two nuts, two washers and an extra large diameter washer.

How To Build It

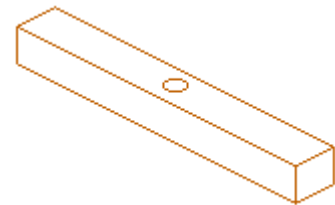
Note: *As a kid it seemed perfectly alright to put everything together with nails. But now the idea of nails holding together parts under stress makes me cringe and I always think of using screws. However, the nails always worked so I can't say they are not good enough. In the following instructions, if I say to nail something together and you would rather use screws then do so. Keep your eye on nailed joints to be sure they doesn't come apart under use!*

The figure below shows how the frame of the billy cart is assembled. The dimensions are a rough guide only. The long piece should be sized so that whoever is going to ride the billy cart can sit on

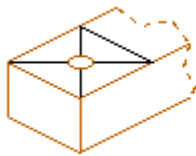
the seat and turn the front cross bar with his feet.



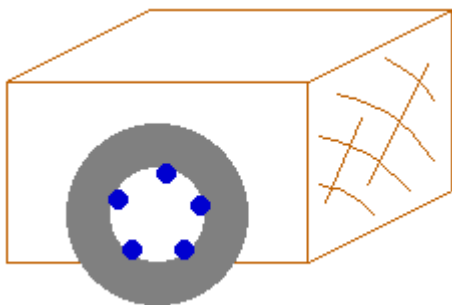
1. Cut the building lumber into nine pieces with the following lengths. Note that none of the dimensions are critical: cut to the nearest 10 mm.
 - one long piece of 1200 mm
 - two cross pieces of 600 mm
 - four wheel supports of 85 mm
 - two seat supports of 70 mm
2. Drill a 9mm hole through the centre of one of the cross pieces as shown in the figure. Be careful to drill the hole vertically through rather than at an angle.



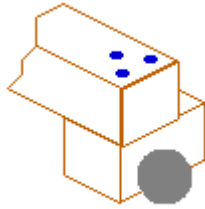
3. Drill a 9mm hole through the long piece at one end as shown in the figure. Make sure this hole is drilled vertically, too.



4. Attach a ball bearing to a wheel support using the 40 mm nails. The ball bearing should protrude at least 10 or 15 mm below the bottom edge of the wheel support. And the outer ring of the ball bearing must not contact the wheel support or it will prevent the wheel from turning smoothly. Put four small flathead nails (or tacks) into the wood and underneath where the inner ring of the ball bearing will be. The nail heads should be just above the surface of the wood so that the ball bearing contacts only the nails heads and not the wood. Use six nails or so to hold the ball bearing. place the ball bearing against the support and hammer the nails in around the inner edge of the ball bearing. Make sure that the ball bearing is firmly secured; bend the nails outwards if needed. Attach the other three ball bearings to their wheel supports too.



5. Nail the four wheel supports to the underside of the two cross pieces with three 80 mm nails.



6. Nail the rear cross piece to the rear end of the long piece (that is, the end without the hole drilled in it) with two 80 mm nails. Make sure the cross piece is at right angles to the long piece. Also nail the seat supports to the cross piece. Put the nails through from the cross piece into the long piece.
7. Nail the seat to the long piece and the supports with the 40 mm nails.
8. Assemble the front cross piece to the long piece. Take the bolt and put a small washer on it, then the cross piece (push the bolt in from underneath), then put the large washer on, then the long piece then the small washer then the two nuts. Tighten the first nut by hand then screw the second nut down against the first and tighten them against each other with spanners.

The billy cart is complete! Sit on the seat and grip the seat with you hands. Steer with your feet on the front cross piece. Make sure that the long piece is the right length so that you can turn the front cross piece adequately. There is no brake but you can stop but putting the billy cart into a spin and making it skid sideways down the hill.