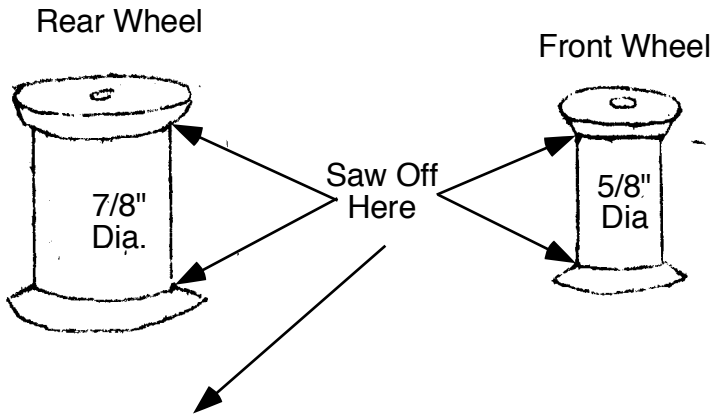


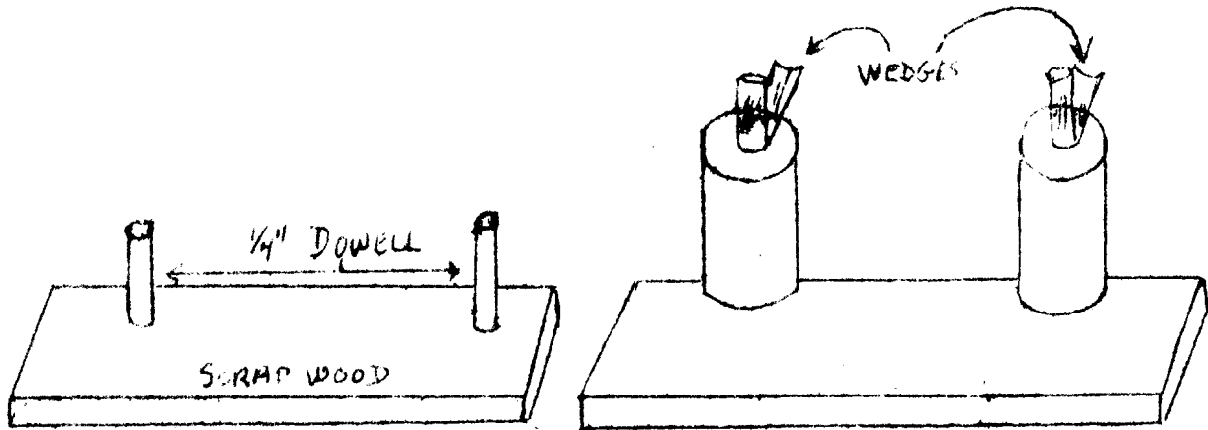
I think that most of we amateur Circus model Builders will agree that the most difficult part of Circus Wagons to build is the wheels, especially in 1/4" scale. You may say, "Why build them when you can buy them?" Wardie Jay wheels are good and the new Globe Kit wheels are just about perfect, but there is a certain satisfaction in building your own. After many trials and errors I arrived at a method to make wheels with hardly any expense but lots of time and patience. You will need some cardboard the thickness of government post cards, which will do nicely, two common spools, some 1/4 in. dowels, a box of round toothpicks, glue, common pins and scrap wood. The first thing to do is to make a jig as below.



Leaving Spools Like This



Slip spools down over dowells, make two wedge shape pieces of wood and put in to keep spools tight.



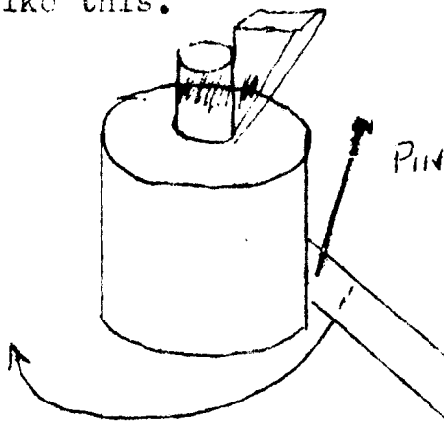
Plans Superintendent Notes

Since the plan was written many years ago and wood spools may not be available. If spools can not be found, appropriate sized dowel rod could be used. A 1/4" hole would have to be drilled in the center of the dowel pieces. The remainder of the operation would proceed as indicated in the plans.

Making 1/4" Wheels			
DATE: None	SCALE: None	SCANNED & REVISED: 04/16/02	Pg 1 of 3
Circus Model Builders			
Drawn By Paul West			DRAWING NUMBER #0091

Cut cardboard in strips with a single edge razor blade, using a ruler with a metal edge to get them straight. Cut them the width that you want the tire in the wheel to be. Start each strip on the jig like this.

like this.



Wrap strip around the spool and hold in place with a pin, take another strip, coat with glue, wrap around and over first strip, putting on four or five layers, depending on how thick you want the rim, hold last strip in place with pin until dry. While this rim is drying make one on the other spool, then pull out the wedge, take spool off dowel, slip rim off spool and repeat until all 4 rims are done. In about 45 minutes you should have four rims like this (not to scale)

Strip should be long enough to go around spool about twice.

Sandpaper the fronts and backs lightly with very fine sandpaper to take cut any irregularities.



Now cut eight small circles 3/8 in. diameter, punch a hole in the exact center of each with a pin.

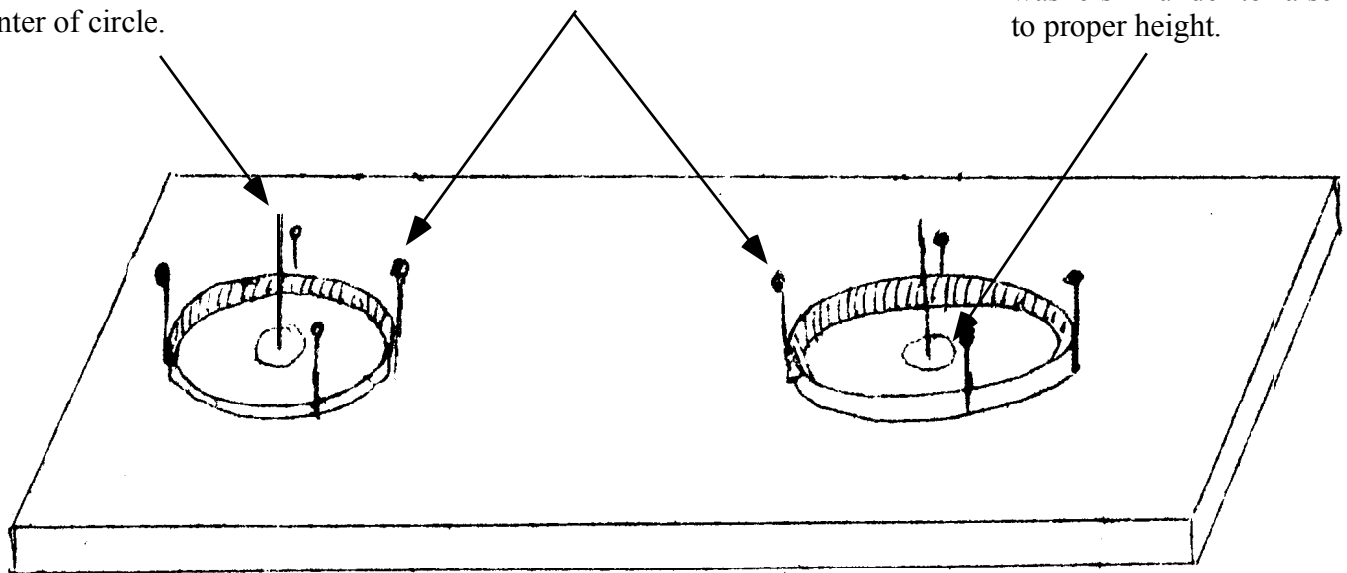


Then make a jig like this.

Pin with head cut off place in the exact center of circle.

Pins to hold rim in place

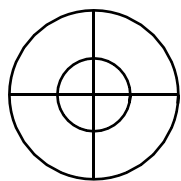
Cardboard 3/8" circle. Place two or three metal washers in under to raise to proper height.



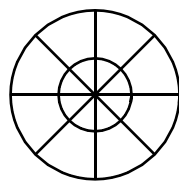
Mark circles out on scrap piece of wood the same diameter as outside of wheel, then pin the rim in the circle, using pins to hold in place, putting pins on OUTSIDE only, four should be enough. Put a pin, after cutting head off, in the exact center of circle, slip two or three metal washers over pin, raise hub up, and then place one of the 3/8 in. discs over center pin on top of washers. You are now ready to put in the spokes. Those can be made from round toothpicks or any other similar round sticks. Cut the tooth picks so that the part with the smallest diameter is used.

Making 1/4" Wheels

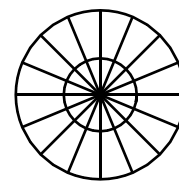
These need not all be the exact length, they can vary a fraction of an inch or so but each spoke must be long enough to reach from outside of 3/8 circle to inside of rim. Cut enough spokes for four wheels, 16 each, pick up a spoke with a pair of tweezers put a drop of glue on each end and place one end of the spoke on top of the 3/8 disk and the other end against the inside of the rim. Put spoke in opposite of each other in the following order.



Place first four spokes, move on to next rim until all four are done.

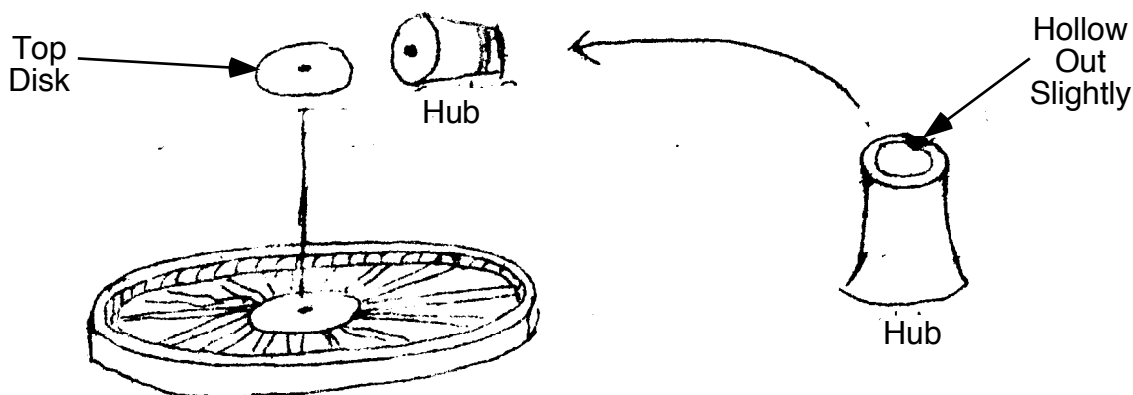


Final eight spokes are placed between ones already in.



Move back to first wheel and place four more spokes like this. Repeat on all 4 wheels.

Notice that spokes need not be even at the hub, just so they do not overlap each other. After all sixteen spokes are in, place another one of the 3/8 in. disks down over the center pin and glue. I made hubs from 1/4 in. dowells shaping them by chucking them in a power drill and using files and sandpaper to smooth them up. The front of the hub should be hollowed out slightly. If you have a lathe, making these hubs is a simple job. They can be shaped by hand although it takes a little longer. After the hubs are shaped to your satisfaction drill a hole in the center of each and slip it down over the center pin until it rests on the top 3/8 disk. Glue in place.



Let the wheels set until glue is dry, at least an hour or two, then pull center pin and the pins holding the rim out and very carefully pry wheel loose from board.

Paint entire wheel white or yellow, giving each two coats of good enamel. Paint the tires sliver or black. If the wheels are for a baggage wagon no sunburst are needed but a few painted red or black stripes helps to improve the looks of the wheel. To make sunburst wheels, cut a circle slightly smaller than the diameter of the wheel from a colored advertisement in a magazine, and glue it on the back of the wheel that the colored portion shows through the wheels. Do this AFTER wheel has been painted. Different colored pin stripes put on with a small brush improve the looks of the wheels although they look pretty good without them. Unless you are fairly adept with a brush it is better not to attempt to put them on as nothing can spoil a good wheel as much as a poor paint job.

These drawings are not any too good and are NOT TO SCALE, but believe me, you can make some really beautiful wheels in the above manner. It also may seem to you like a lot of time and trouble, but the next time you show your models you can point to them with pride and say, "I made them all, EVEN THE WHEELS!"

Making 1/4" Wheels