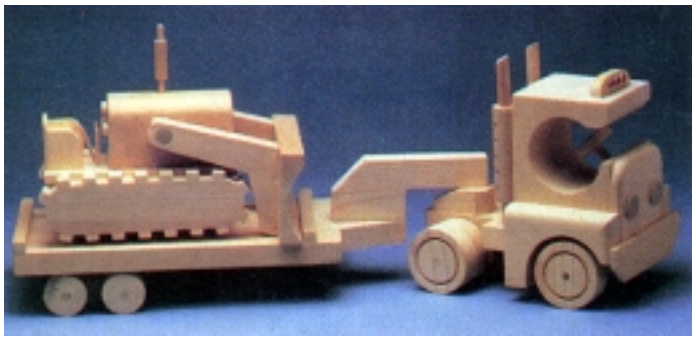
The Three-Piece *Construction Crew*

Norm Marshall's creative toys stimulate the imagination



Norm Marshall, retired Naval aviator, husband and father had a happy passion: making toys for children.

Norm passed away in 1982, but it's fitting that he was born on Christmas Eve in 1932 because, based on the quality and "playability" of his toy plans, we're certain that Jolly Old St. Nicholas smiled down on Norm a lot!

There's nothing Norm enjoyed more than making toys designed to bring long-lasting smiles to the faces of children and their parents. Interestingly, he refused to sell one of his toys. "I'll build them to give away." he said as he leaned back at his drawing board, "but I'll never sell them." "I'll gladly teach someone how to make them...but I don't want to get into mass production."

A 1978 graduate of The Shopsmith Woodworking Academy, Norm sat down for an interview with "Hands-On!" shortly before his passing in 1982. This series of projects begins with that interview.

The interview:

I started this little hobby of mine under doctor's orders. I guess that 25 years of military service, more than 5,000 flight hours and over 500 landings on aircraft carriers for the Navy left my nerves a little strung out. I needed some relaxation.

In casting about for a hobby, I read Peter Stevenson's book, "The Art Of Making Wooden Toys". I really liked what he had to say. I started making toys with hand tools but found that it took just too much time. In 1978, I bought my Shopsmith MARK V and attended Shopsmith's Dayton-based Woodworking Academy. I'll never forget the fun that we had in that class. That's when the woodworking hobby really started opening up for me.

I'm having a ball, now. In my opinion, toymaking is perfect for novice woodworkers. The Bandsaw or Scroll Saw will take a lot of the tedious labor out of it. They're easy tools to use...someone who knows how to use a sewing machine can learn the basics...in a few minutes.

When you actually get into the workshop, making a toy should be a leisurely, inexpensive four or five hour project. It should let you unwind. The idea for the toy can ripen in your mind for days or weeks. Then, it mellows on the drawing board and finally evolves under your hands on the work-bench.

There are no big secrets to it. Well, on the other hand, maybe one: HANG LOOSE! Just remember that when you're making a toy, you're not working on something that's going to change he world. You should be happy to make it, happy to give it away...and the person who receives it should be happy to get it.

We're all kids at heart. When I see a train locomotive, a bulldozer or a crane, I ask myself: "Where are the things on it that **I'd** like to play with?" Then, I go home and doodle with drawings.

I'm always thinking about toymaking. That's why I carry a little notebook with me. I use it to record thoughts and flashes of inspiration. It helps to have the *Angel of Serendipity* looking over your shoulder, too. *Serendipity* is unexpected good luck.. I remember, for instance, the day I walked into a hardware store and noticed a little pulley. It was the tiniest one I'd ever seen. Right then I knew that

I'd make a toy that used it. It was going to be either a toy wrecker/tow truck or a crane. It ended up on a crane.

Then, there was the time my wife and I were looking through a gift store in Northern California. I happened to notice a little Christmas Tree ornament. Really, it was kind of crude.Someone had decorated it with tiny slabs of wood, all the same size. That's where I got the idea for how I'd make the treads on my bulldozer: little slabs of wood glued onto an elongated oval.

I strongly feel that you have to be sensitive to the child when you're making a toy. That's why I don't spend a lot of time making one toy...and why I always use pine instead of hardwood. Use hardwood and you're tempted to put too much detail into the project. It turns into a *model* and not a *toy*...then ends up on the mantel collecting dust. The unwritten message on it is..."Don't touch this. You might break it."

Toys are meant to be played with...even to be broken. If you took too long to make it or it cost too much and then the child breaks it, three things happen. First, you, yourself are crushed. Second, the child is unhappy and feels guilty. Third, the child's parents overreact with embarrassment.

That's not what I want to happen. Toys aren't meant to last forever. If it took four or five hours to make, then five or six hours of pleasure for the child will more than compensate me for my time.

A toy starts with a thought or a child's request. Next, you should take the time to draw out your ideas on paper. I doodle until I get some good ideas then I scale the toy out with an eye for proportions. One easy way to keep a toy looking right is to ask yourself, "How many wheels high is the real thing?" Work in short segments and stick to one project. I also get a kick out of really delving into 'the real thing' behind the toy. If it's an old sailing ship, what's the history of it? How many guns did it carry? How many battles was it in? Who were its famous Captains? All of this research may not go directly into the toy, but it makes it more fun to build.

Boats, however, are real hard to make. Unless you tell them differently, children expect boats to float in the water without listing or dipping. That requires a lot of testing and experimentation. I prefer to tell the children who get my boats that they're for the sandbox or the rug only. You have to be sensitive to children and what they expect. Don't ever disappoint them.

I've also noticed that kids like wheels. The more wheels on a toy truck, the better! But...they all have to touch the ground. They all have to roll together. They can be a little out of round, but the child will always be disappointed if there are one or two 'short wheels' that don't roll with the others.

Don't make 'naked' toys, either. Find some scraps of dowel or thick twigs for the dump trucks and logging trucks to carry. Give children something to stretch the range of their imaginations.

Stretch the range of your **own** imagination, as well. If the toy is simply 'block-on-block', you'll get bored making it. I always try to make mine with pleasant angles and bevels. They're not hard to build, just interesting. I try to make full use of the potential of my MARK V and Bandsaw. Instead of square cuts all around, I'll tilt the table for some 30-degree cuts. That adds some interest for the woodworker and child, alike. A little suggestion of a detail goes a long way.

I use my MARK V in the saw mode for basic cuts...in the disc sanding mode for smoothing...and as a drill press to drill wheels, axle openings and to add detail. I really like its movable table. Most drill press tables only move up-and-down. But on the MARK V, it also moves in-and-out and tilts, too. The self-adjusting Fence and adjustable Depth Stop on the Quill feed make it easy to keep decorative dowels all exposed at the same height.

I use #2 pine, 3/4" thick for all of my toys. Some of the toymaking books tell you to buy special stock, but I disagree. Once I get 3/4" stock resawn on the Bandsaw, I get the basic parts cut quickly.

To make wheels, I start with close-grained stock. I use a 2-3/8" dia. hole saw to cut half-way through...just until the pilot bit punches through the back side. Then, I switch to a 2-1/8" dia. hole

saw and insert it into the same pilot hole. This saw makes a 1/8” deep concentric kerf in the wheel to help define the ‘tire’ from the ‘hub’. Then, I turn the stock over and complete the wheel cutout with the 2-3/8” hole saw...again, in the same pilot hole. Larger wheels can be made easily on a Bandsaw or Scroll Saw, then sanded down on a Disc or Belt Sander.

There should be as little time as possible between the promise of a toy and the fulfillment. That’s why I don’t paint my toys. To do a really good (safe) job of painting takes a lot of time. And then, the child might not like the colors. I find that a little bit of self-adhering vinyl wallpaper and some self-stick lettering from a stationery store brightens the toy. It’s enough to give the illusion of the colors of the real thing.

So, why do I make toys? Because a smile is worthwhile! I enjoy making them and I like to pass that on. Toymaking should be a happy pastime. It shouldn’t get too intensive. But watch out...it **is** addictive!

This Bulldozer with Tractor and Low-Boy Trailer is an example of Norm’s toys and how he recommends building them. Once assembled, you can leave them unfinished or seal them with a non-toxic finish such as Salad Bowl Finish.

The Projects

THE BULLDOZER

This toy features lifelike bulldozer tracks and a two-position blade that’s held off the ground by the exhaust stack engaging a hole in the blade axle. The builder must watch that the chassis center beam (A) and chassis end beams (B) are cut exactly to size, as shown in the Bill of Materials. This provides adequate clearance for the wheels when the tracks are glued to the chassis.

Start by cutting all parts to size, according to the Bill of Materials. Drill axle holes in (A). Glue parts (B) to (A). Install wheels.

Glue track lugs (G) onto track blocks (F), starting on the top and bottom center and working toward the ends. Use a spare lug as a spacer. For lugs glued on the rounded ends, wrap sandpaper over a large dowel...or use a 1-1/2” diameter sanding drum to sand a concave surface for better adhesion.

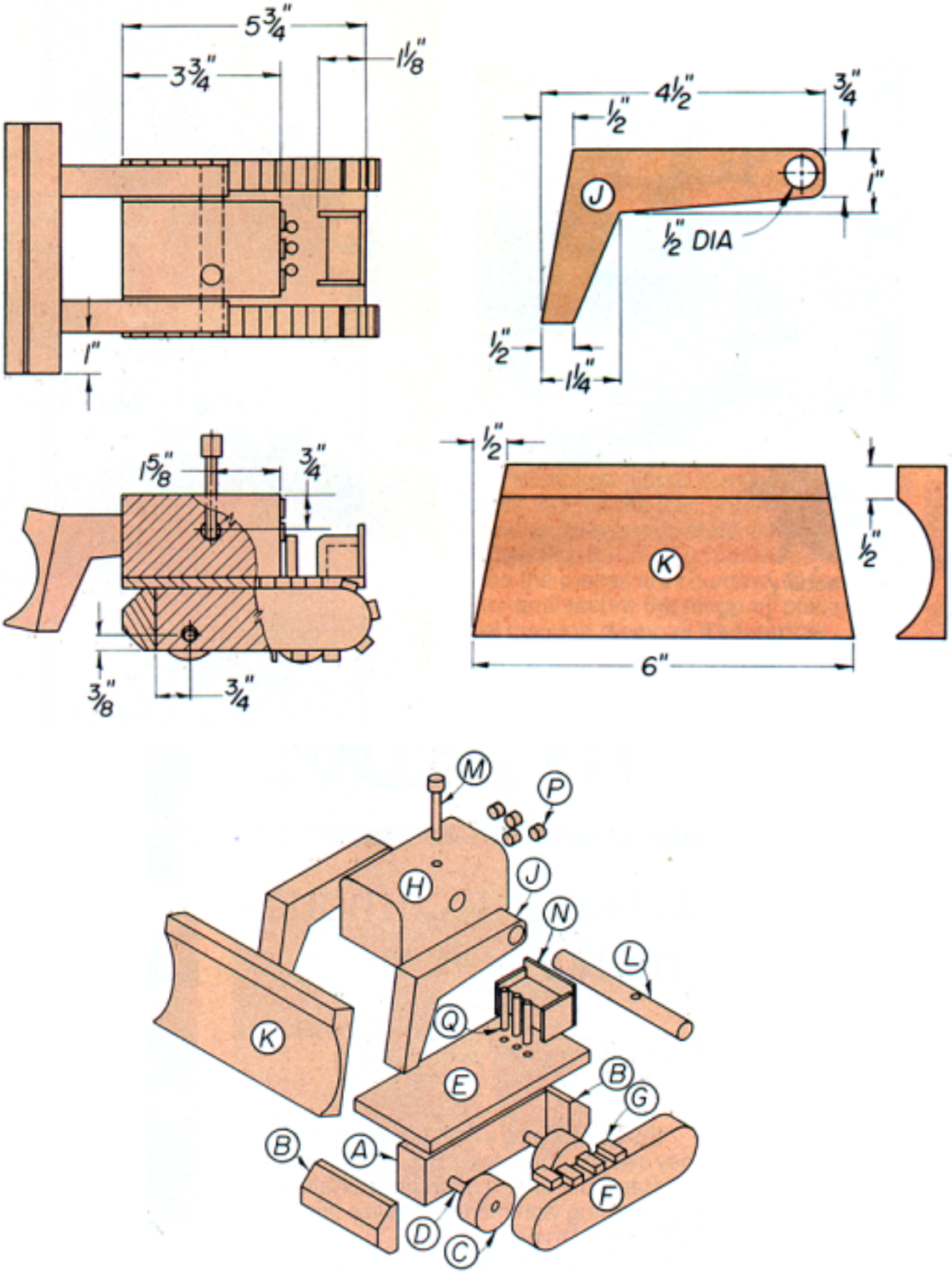
Drill hole for the blade axle (L). Insert blade axle and drill a 1/4" dia. hole for the exhaust stack (M). This hoe goes through the blade axle. Remove the blade axle and redrill the 1/4" dia. hole to 5/16” dia. Drill dashboard holes for the gauges and insert gauges (P).

Blade (K) has a concave face. This shape can be achieved by sanding over the Idler Drum end of your Belt Sander or by using a Drum Sander. Assemble the blade (K), blade axle (L), blade supports (J) and engine (H).

All parts of this toy are held together with glue only. Be sure to round all sharp edges for added safety.

Bill of Materials
(finished dimensions in inches)

A	Chassis center beam	1 x 1-1/2 x 4-1/4	**K**	Blade	3/4 x 2-3/4 x 6
B	Chassis end beams (2)	3/4 x 1-1/2 x 2-3/4	**L**	Blade axle	1/2 dia. x 4
C	Wheels (4)	3/4 x 1-1/4 dia.	**M**	Exhaust stack (2 pcs.)	1/4 dia. x 2
D	Axles (2)	1/4 dia. x 2-5/8	**N**	Seat	3/4 x 3/4 x 1-1/2
E	Chassis platform	1/4 x 2-3/4 x 5-3/4		Seat sides (2)	1/8 x 1 x 1-1/4
F	Track blocks (2)	3/4 x 1-1/2 x 6		Seat back	1/8 x 1-1/4 x 1-1/2
G	Track lugs (36)	3/8 x 3/16 x 3/4	**P**	Gauges (4)	3/8 dia. x 1/2
H	Engine	2 x 2-1/4 x 3-3/4	**Q**	Control levers (3)	1/8 dia. x 1-1/4
J	Blade supports (2)	3/4 x 2-3/4 x 4-1/2			


5¾"
3¾"
1⅛"
1"
4½"
½"
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J
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K
½"
6"
M
P
H
J
N
L
Q
K
E
B
G
B
A
F
D
C

THE TRACTOR

Cut all parts to size according to the Bill of Materials. Saw and drum sand the circular window through the cab (B). Drill the 1/4" dia. hole for the steering wheel shaft (K).

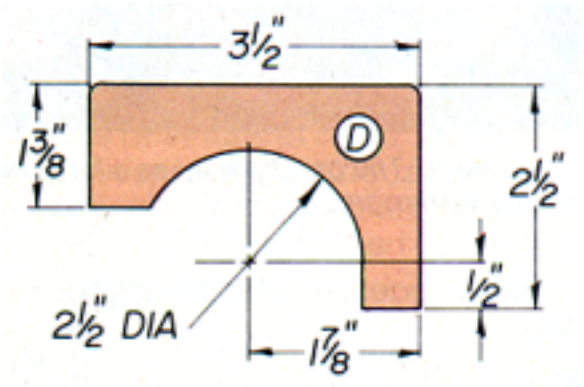
Use a 2-1/2” hole saw, Bandsaw or Scroll Saw to cut the circular outlines in the fenders (D)...then use your Disc Sander or Belt Sander to round the fenders’ top and front outside edges. **Caution:** Remember that there’s a left and right fender – and they’re not interchangeable – so be careful which edges you round!

Make and assemble the wheels (F), axles (G) and carriage (E). Cut and drill the hitch (H). Turn exhaust stacks (J) from 3/4" dowel. Drill 1/8” “ventilation holes” in them for detail. Drill holes in cab light block (M) and use 1/4" dowels for lights. Shape the front bumper (N), round all sharp edges, assemble and glue all parts together.

Bill of Materials

(finished dimensions in inches)

A	Base	3/4 x 3 x 7
B	Cab	3 x 3-1/4 x 4-1/4
C	Grill	3/8 x 2-1/2 x 3
D	Fenders (2)	3/4 x 2-1/2 x 3-1/2
E	Front carriage	3/4 x 1-1/4 x 3
	Rear carriage	3/4 x 1-1/4 x 2
F	Wheels (6)	3/4 x 2 dia.
G	Axles (2)	1/4 dia. x 4-5/8
H	Hitch	3/4 x 1-1/2 x 2
J	Exhaust stacks (2)	3/4 dia. x 5-1/4
K	Steering wheel	1/4 x 1-1/4 dia.
	Steering wheel shaft	2-1/2 x 1/4 dia.
L	Headlights (2)	3/4 dia. x 1/2
M	Cab light block	3/8 x 1/2 x 2
	Cab lights (3)	1/4 dia. x 1/2
N	Front bumper	1/4 x 1-1/4 x 4-1/2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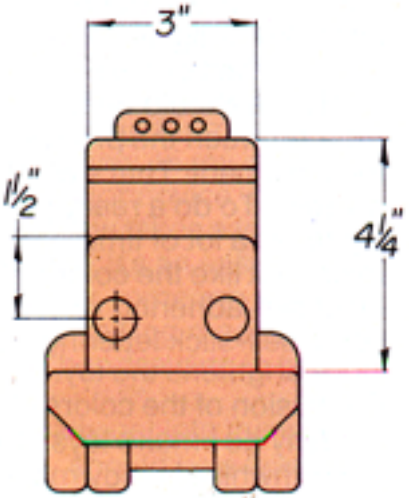
1⅜"
D
2½"
2½" DIA
½"
1⅞"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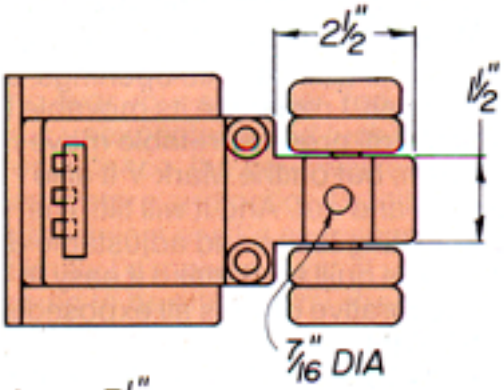
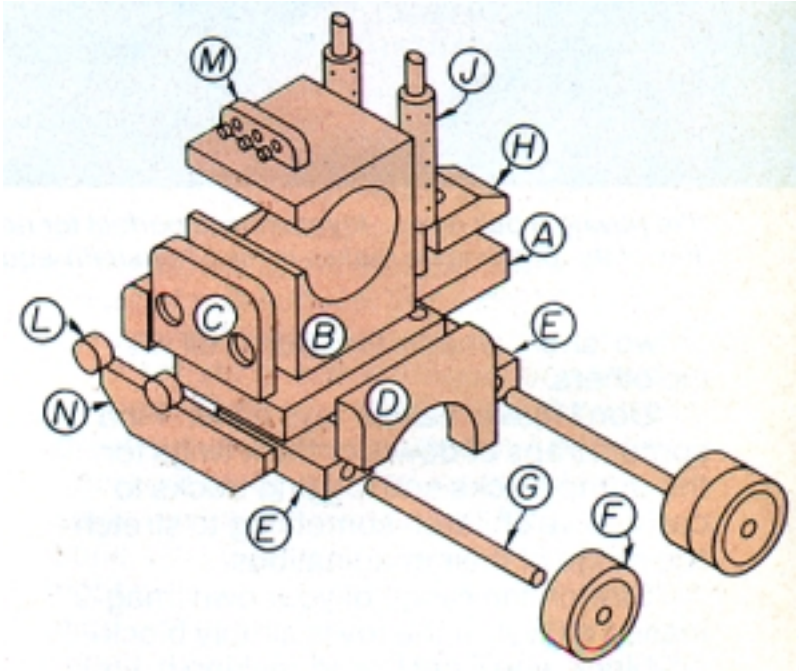
4¼"


2½"
1½"
7/16" DIA


M
J
H
A
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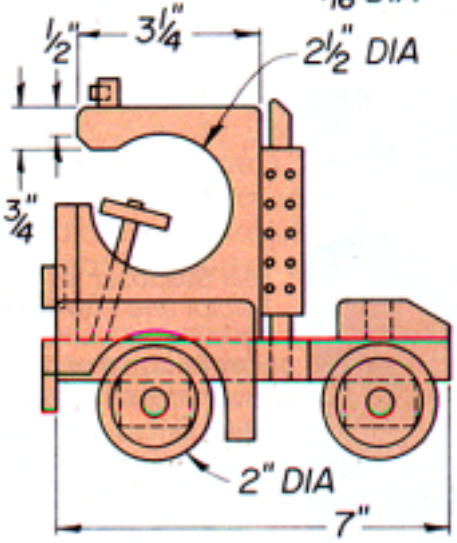
F


½"
3¼"
2½" DIA
¾"
2" DIA
7"

THE LOW-BOY TRAILER

Cut all parts to size according to the Bill of Materials. Drill the two axle holes in the carriage (D) and glue the two pieces together. Make and assemble the wheels (E), axles (F) and carriage (D).

Cut the coupling arm (B) to shape. Glue this onto the floor (A). After the glue has set, reinforce this butt joint with a flush-set 3/8" dowel. Round all sharp edges.

Assemble and glue all parts together.

Bill of Materials
(finished dimensions in inches)

A	Floor	3/4 x 5-3/4 x 12
B	Coupling arm	3/4 x 2 x 4-3/4
C	Coupling pin	3/8 dia. x 1-5/8
D	Carriage (2 pcs.)	3/4 x 2-1/4 x 3-3/4 3/8 x 2 x 3-1/2
E	Wheels (4)	3/4 x 1-1/4 dia.
F	Axles (2)	1/4 dia. x 5-1/4
G	Stops (2)	3/8 x 3/8 x 5-1/2
H	Dowel	3/8 dia. x 2-5/8