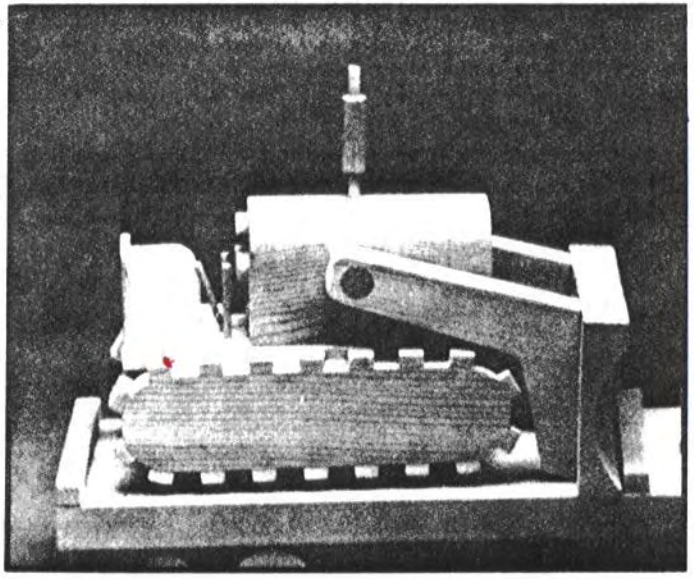
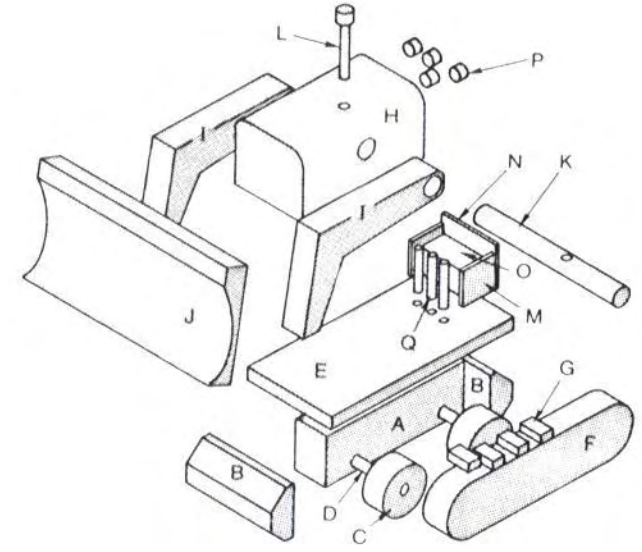
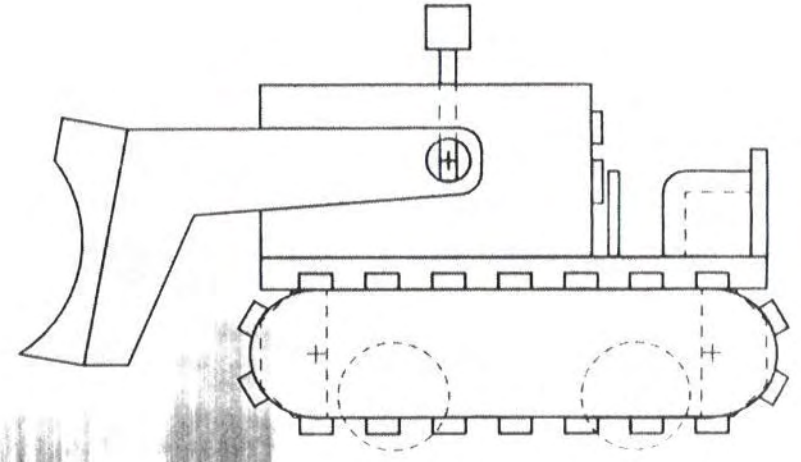
BULLDOZER



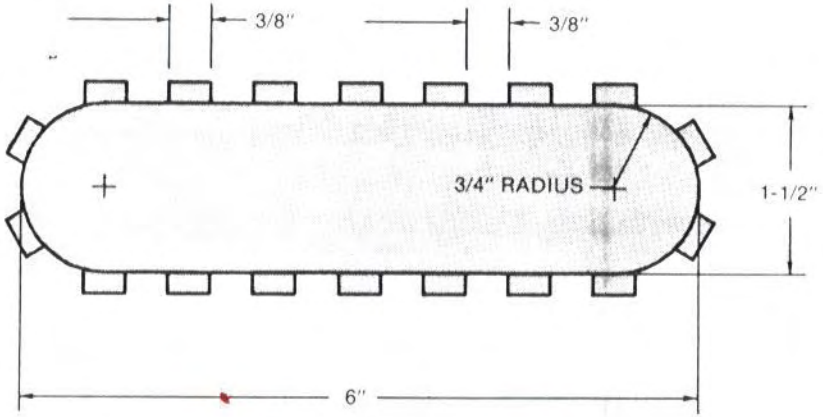
Little contractors will enjoy preparing building sites on the carpet or in the sandbox with their own bulldozer. And the life-like caterpillar tracks and two-position blade (which locks into place with the exhaust stack) add an interest for both you and the child.

To construct this project, you need basic woodworking skills. Also, be sure to read through all the instructions for tips on making the chassis, tracks, and blade. After you've finished the bulldozer, make the low-boy trailer so you'll be able to move this piece of equipment from one site to another.

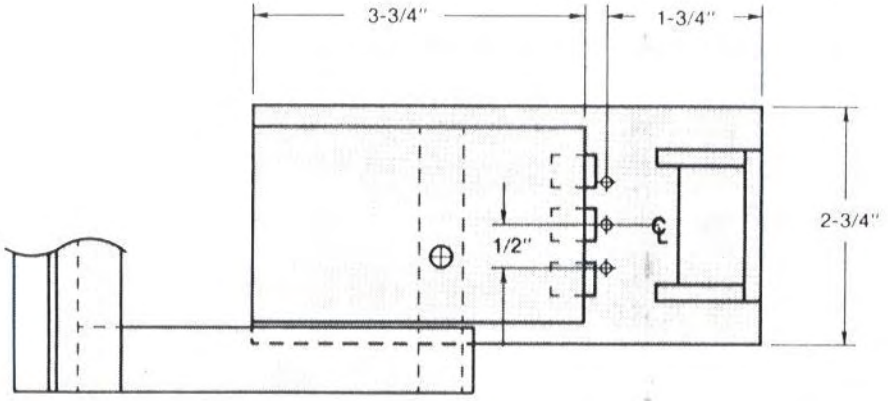




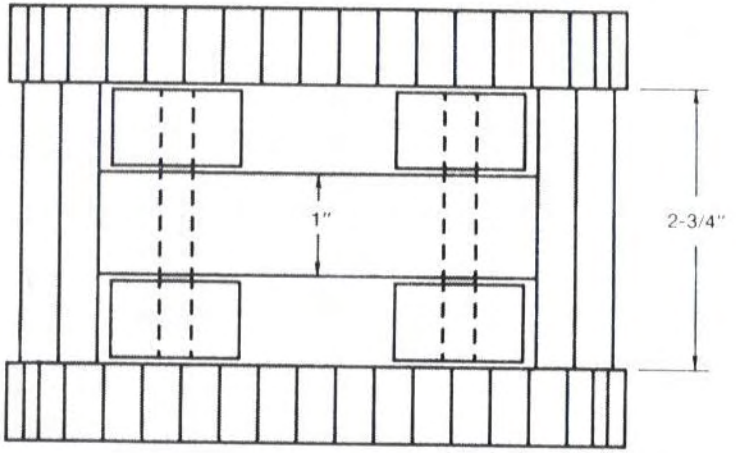
SIDE VIEW



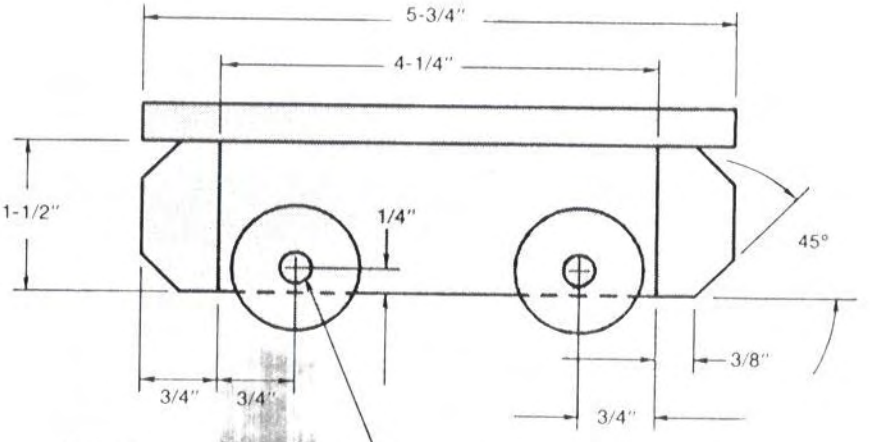
TRACK DETAIL



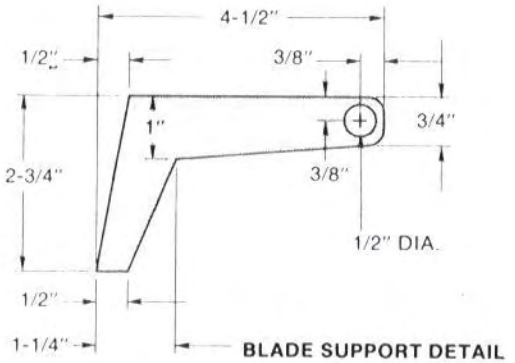
**TOP DETAIL
(ABOVE PLATFORM)**



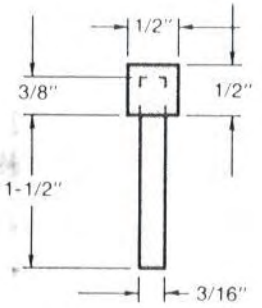
**CHASSIS TOP DETAIL
(BELOW PLATFORM)**



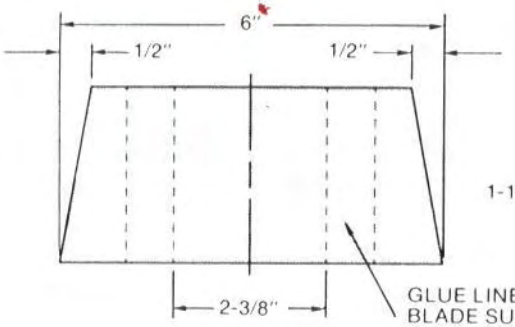
CHASSIS SIDE DETAIL



BLADE SUPPORT DETAIL

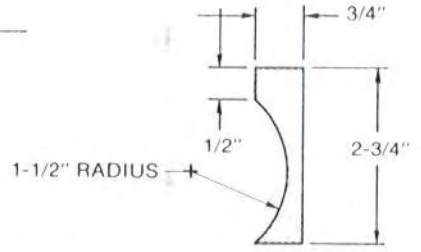


EXHAUST STACK

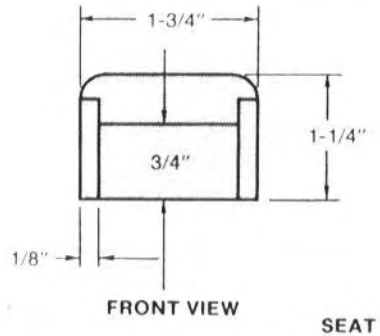


FRONT VIEW

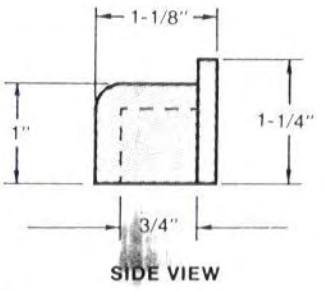
BLADE DETAIL



SIDE VIEW

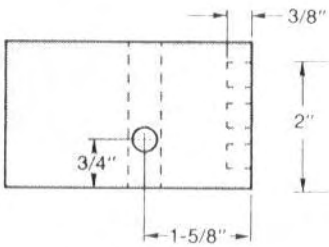


FRONT VIEW

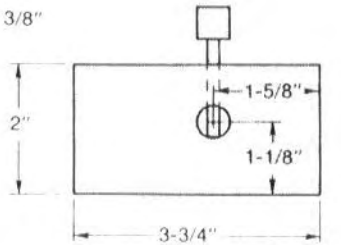


SIDE VIEW

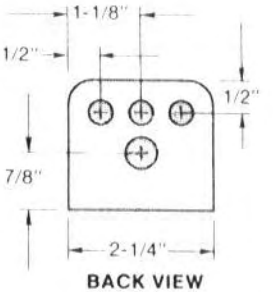
SEAT DETAIL



TOP VIEW



SIDE VIEW



BACK VIEW

ENGINE DETAIL

PROCEDURE

1. CHASSIS

The first step in constructing the bulldozer is to build the chassis. Begin by cutting the chassis center beam (A) to the final dimensions and drilling the two 5/16"-diameter axle holes where indicated in the plans.

Next, prepare the end beams (B) by chamfering a long piece of stock then cutting the parts to length—this will make handling the stock safer if you're using power tools. Make the end beams as close to 2-3/4" long as possible since this dimension determines the wheel clearance. Assemble the wheels (C) and axles (D) to the center beam with glue. Finally, glue and clamp the end beams to the center; then set the entire assembly aside.

2. TRACKS

To make the tracks, use a power sander or scroll saw to round the ends of the track blocks (F). Next, prepare a 3/16" × 3/8" × 36" piece of stock for making the track lugs (G). Cut the 36 lugs to length. Then, starting with the top and bottom center lugs, glue and clamp the lugs onto the track block two at a time. Use a spare lug as a spacer as you go.

When you get to the ends of the track blocks, you'll need to make the end lugs slightly concave to fit flush on the blocks. To do this, wrap sandpaper around a piece of closet pole or large dowel and sand the inside faces of the remaining lugs. Glue and clamp the end lugs in place and space them evenly to make up for any variations in the size of the track blocks. Once the glue has thoroughly dried, sand the sides of the track assemblies flush and set aside.

3. ENGINE

Make the engine (H) by gluing up three pieces of 3/4" stock and sanding it so the block is square; then round the top side edges. Next, locate the holes you'll need to drill—one on top, one through the side, and four in the rear. Note that the hole through the top must be in direct line with the hole through the side.

After drilling the holes, sand the blade axle (K) and insert it through the side of the engine. Using the exhaust stack hole as a guide, drill a 3/16"-diameter hole through the blade axle. Remove the blade axle and, with a twist drill bit, redrill the hole in it to 1/4" diameter so a child will not have to precisely line up the axle hole with the engine hole to engage the lock. Finally, glue the gauges in place and set the engine aside for assembly later.

4. BLADE ASSEMBLY

The concave curve on the blade (J) looks difficult to make, but it's simple. There are three recommended methods for making the curve. First, you could use a coving procedure on a table saw. Although this is probably the most dangerous method, it can be done if all safety rules listed in your table saw owner's manual are followed and all other safety procedures are followed. When coving the blade, work

with a piece of stock at least 18" long and always use a push block. The second method of coving a blade is to use a bandsaw. With this method, cut the stock to length, then hold it on edge to cut the curve. After cutting the cove, angle the sides. Since bandsaws leave a rough surface, you'll need to do a little sanding after using this method.

The easiest and safest way to cove a blade for this bulldozer (and the road grader) is to use the roller end of a belt sander or a 2"-diameter or larger drum sander. You'll be surprised how fast coarse or medium sandpaper cuts pine. After making the blade, cut it to length and angle the sides.

Next, make the blade supports (I). For added strength, make sure the grain goes diagonally. Drill the blade axle holes in the supports; then glue and clamp the supports to the blade. If you wish, reinforce the blade support with dowel pins.

5. SEAT ASSEMBLY

To make the seat, cut out all the seat parts (M,N,O) and contour them according to the plans. Glue and clamp the sides to the seat (O) and sand the back side flush. Then glue on the back and sand it flush with the sides.

6. EXHAUST STACK

You can make two types of exhaust stacks. The first is like the one in the photo—it's made from a 3/8"-diameter dowel with a 3/16"-diameter dowel through the middle of it. The second type, shown in the plans, is easier to make. This "can" type exhaust stack is made by drilling a 3/16" hole in 1/2" dowel stock. Next, cut the 1/2" dowel and 3/16" dowel to length and glue and clamp them together.

7. CHASSIS ASSEMBLY

Cut the chassis platform (E) to final dimension and drill holes for the control levers (Q) as indicated in the plans. Glue and clamp the seat assembly to the platform, then set the platform assembly aside.

Glue and clamp the track block assemblies to the end beams. Dry-clamp these assemblies first to make sure the wheels roll freely. After the glue has dried, glue and clamp the platform to the chassis assembly. Glue the control levers (Q) in place.

8. ENGINE/BLADE ASSEMBLY

Attach the blade assembly to the engine by first inserting the blade axle (K) through the hole in the side of the engine. Next, dry-assemble the blade supports to the axle and turn the axle so the hole in it lines up with the exhaust stack hole. Lock the blade axle in place by inserting the exhaust stack; then, set the engine and blade assembly on a flat surface to put the blade in the up position (that is, the bottom of the blade is level with the bottom of the engine). With the blade and engine in this position, glue the blade supports to the blade axle. After the glue has dried, glue and clamp the engine/blade assembly to the chassis.

9. FINISHING TOUCHES

After the glue has dried, thoroughly sand the project with medium or fine sandpaper. Make sure there are no sharp edges—especially on the blade.

If you want to paint this toy, prime it with an oil-based primer and spray the entire toy with yellow paint. After the paint has dried, paint the tracks, exhaust stack, levers, and seat black.

MATERIALS

Part	Description	Pieces	Dimensions
			(finished dimensions in inches)
A	Chassis center beam	1	1-1/2 × 1 × 4-1/4
B	Chassis end beams	2	3/4 × 1-1/2 × 2-3/4
C	Wheels	4	1-1/4 dia. × 3/4
D	Axles	2	1/4 dia. × 2-5/8
E	Chassis platform	1	3/8 × 2-3/4 × 5-3/4
F	Track blocks	2	3/4 × 1-1/2 × 6
G	Track lugs	36	3/16 × 3/8 × 3/4
H	Engine	1	2-1/4 × 2 × 3-3/4
I	Blade supports	2	3/4 × 2-3/4 × 4-1/2
J	Blade	1	3/4 × 2-3/4 × 6
K	Blade axle	1	1/2 dia. × 3-7/8
L	Exhaust stack	1	1/2 dia. × 1/2
		1	3/16 dia. × 1-7/8
M	Seat sides	2	1/8 × 1 × 1
N	Seat back	1	1/8 × 1-1/4 × 1-3/4
O	Seat	1	3/4 × 3/4 × 1-1/2
P	Dashboard gauges	1	1/2 dia. × 1/2
		3	3/8 dia. × 1/2
Q	Control levers	3	1/8 dia. × 1-1/4

CONSTRUCTION NOTES

1. For safe handling, parts B,G,J, and L are cut to final length after all other woodworking operations have been performed on them.
2. Wheels are made using a 1-3/8"-diameter hole saw.