Build it to scale:

S & M's ANTIQUE TRUCK

THE SCIENCE & MECHANICS half-size antique truck with its 2-hp, 4-cycle gasoline engine makes a really sensational toy for a youngster. It will carry Junior around the lot at a brisk 13 mph, yet will come to a safe and sure stop when he pulls back on the old-fashioned hand brake. And there's enough room for Sis to tuck into the seat beside him too.

The frame is welded steel-angle stock; the body is plywood, Masonite and white pine. A small amount of machining is required to make some of the chassis parts. To give the truck a more professional appearance, the wheels, hub caps, steering wheel, pillow blocks, brake drum, ball joints and fenders can be purchased (see Materials List at end of article).

Frame. Construction begins with the frame (Fig. 1). While ordering the steel angle for the frame, have all the other steel cut that will be required for the truck.

The frame consists of two side rails of 1/8-inch steel angle measuring 1-1/4 x 1-1/4 x 54 inches, and three cross members each 17-1/2 inches long. Use a framing square to lay the frame rails and end pieces square with each other, then clamp and weld. The over-all outside dimension of the frame will be 18 x 54 inches.

(Turn page)
The four axle hangers (Fig. 1) are made of hot-rolled steel stock that can be bent cold in a vise. The rear hangers are shorter in height than the front hangers to compensate for the pillow blocks. Mount the hangers to the frame with 1/4-inch roundhead stove bolts.

**Axles.** The spindle yokes for the front axle are made of 1/4x1-1/4-inch hot-rolled steel bent to shape in a vise. Drill the 1/2-inch king bolt holes in the yoke ends. The front axle is 1-inch-diameter steel tubing 20-1/2 inches long. Weld the yokes to the tubing so they are centered on the tube ends and parallel. Clamp and weld this assembly. Drill the 1/2-inch hole in the perch, then place it in the center of the axle at a 27° angle from the horizontal plane and weld it.

The spindles are identical except that the right-hand spindle arm has two 5/16-inch holes for mounting the drag link. Weld the wheel spindles (5/8 x 2-1/2-inch-long hex head bolts) to the spindle bodies at a 90° angle to the spindle arms.

**Make the rear axle** of a 24-inch-long piece of 1-inch-diameter steel tubing and pin the 5/8-inch-diameter stub axles in the ends of the tubing with 1/4-inch pins. The stub axles are simply 5/8-inch-11 hex-head bolts 5 inches long with their heads sawed off. They extend 2-1/2 inches outside the tubing to make an over-all axle length of 29 inches.

Machine the drive plate (Fig. 1) from a
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I. Sheet metal or Fiberglass fenders should clear top of the tires by about 1-1/2 inches.

J. Rear view of the completed truck points up faithful reproduction of original design.

piece of 3/16-inch hot-rolled steel turned to a 3-inch diameter and with a 1-inch hole bored in the center which will provide a slip-fit for the rear axle. Drill the two 1/4-inch holes in the plate 180° apart, then weld the plate to the left side of the axle and flush with the end of the tubing. Weld inboard on the axle, because the outside face of the plate must bolt flush to the drive wheel.

Fabricate the brake adapter and drill the two 1/4-inch set-screw holes, then transfer the hole pattern in the brake drum to the brake-adapter plate and mount it to the plate with four 1/4-inch hex-head bolts.

Now proceed with the following sequence on the rear axle (Fig. 1): (1) slip a locking collar and then a 1-inch pillow block onto the axle and slide it toward the drive plate; (2) slip on the 36-tooth sprocket (1-inch bore); (3) slip on the other 1-inch pillow block and locking collar; and (4) slide the brake drum assembly onto the axle with the adapter tubing pointing toward the center of the axle.

Position the rear axle assembly so that the pillow blocks are in line with the rear axle hangers. Mount the pillow blocks to the hangers with 3/8-inch hex-head bolts and nuts, centering the axle for length. The brake drum and 36-tooth sprocket are positioned later.

Mount the front axle to its axle hangers with 1-inch U-bolts and shackles. Center the axle for length with the yokes at 90° angles to the frame. With the two axles thus mounted, the wheelbase of the car should measure 38 inches.

Complete the front axle assembly by threading the tie rod and drag link ends with 1 inch of thread on the ends. Screw the ball joints to the ends. The spindle bodies are held in place in the yokes with 1/2 x 4-inch-long hex-head bolts (king bolts) and lock nuts. Attach the tie rod to the holes in the spindle arms, and the drag link to the remaining hole in the right-hand spindle.

Paint the frame before putting the wheels on the axles. Spread on a coat of metal primer, finishing with a coat of flat black enamel. Paint the wheels with bright red enamel.

When the paint has dried put on the front wheels and lock nuts, with the lock nuts backed off 1/4 turn from the snug position so the wheels revolve freely. Tap the hub caps into place. The front wheels should have about 1/16-inch toe-in when properly mounted.

The right rear wheel is the free wheel and is put on next. The left rear wheel is the drive wheel. Slip this wheel onto the axle, then transfer the screw-hole pattern from the drive plate to the wheel. Remove the wheel and drill and tap it for two 1/4-inch -20 tapped holes. Put the wheel back on and secure it to the drive plate with two 1/4-inch -20 hex-head bolts. Tighten the lock nut into place, then tap on the hub cap.

Brake assembly. Make the brake band arm (Fig. 1) and mount it to the right rear
with 1 inch of thread on both ends. Drill the and pillow-block holes. Tighten all mounting bolts in the engine holes jack shaft lines up with the axle sprocket. The jack-shaft sprocket is in line with the clutch sprockets (Photo H) so that the 36-tooth sprocket, and the smaller sprocket on the jack shaft lines up with the axle sprocket. Fit the chains so there is about 1/2 inch of slack halfway between the sprockets. Then tighten all mounting bolts in the engine holes and pillow-block holes.

The radiator (Fig. 2) is made of wood, the (Continued on next page)
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top curved portion being cut from a piece of 4x4-inch lumber; the front and sides are plywood. It is assembled with Weldwood glue and flathead screws. The dashboard is cut from 1/2-inch plywood and screwed and glued to the radiator assembly. Paint the radiator assembly with bright red enamel, the radiator itself flat black trimmed with brass paint.

The seat is made of plywood and assem-
mounted 1/2 inch behind the front edge of the floorboard. The cab mounts flush with the rear edge of the floorboard. Use flathead wood screws turned in from the underside of the floorboard.

Now pick up the whole floorboard assembly and fit it onto the frame, guiding the steering shaft through the clearance hole in the floorboard. The body is held to the frame with four 1/4-inch carriage bolts. Slide the steering shaft support over the steering shaft and attach it to the dashboard with two round-head screws. Insert the 1/4-inch pin in the steering shaft, then mount the steering wheel and cap it with an acorn nut.

Mount the accelerator foot pedal through the elongated hole in the floorboard and attach it to the frame with spacer bushing, bolt and nut. Attach the throttle control cable (Photo D) to the pedal, put on the pedal-return spring and adjust the cable for proper return action to the carburetor.

**Stake body.** The stake body (Figs. 2 & 3) is made of 1/4 x 2-1/2-inch finished white pine. The rear stake section may be a permanent or removable installation. For a removable section make the two brackets shown in Fig. 2. The base for the stake body is of 1 x 4-inch white pine mounted to the bed of the stake body with flathead screws turned in from the top. Leave the stake sides their natural color, using a shellac sealer and a varnish finish. Mount the complete assembly to the frame by the four side straps secured to the base and frame with 1/4-inch round-head screws.

The headlights and taillights are optional. Add a radiator cap cut from the end of a file handle.

**Go over the truck** thoroughly now, making sure all nuts and bolts are tight. Then fill the tank with gas and the crankcase with oil and start the engine (which is readily accessible from beneath the stake body). Adjust it for idling speed so that it will de-clutch automatically when you release the foot pedal.

Hop in, and away you go.

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