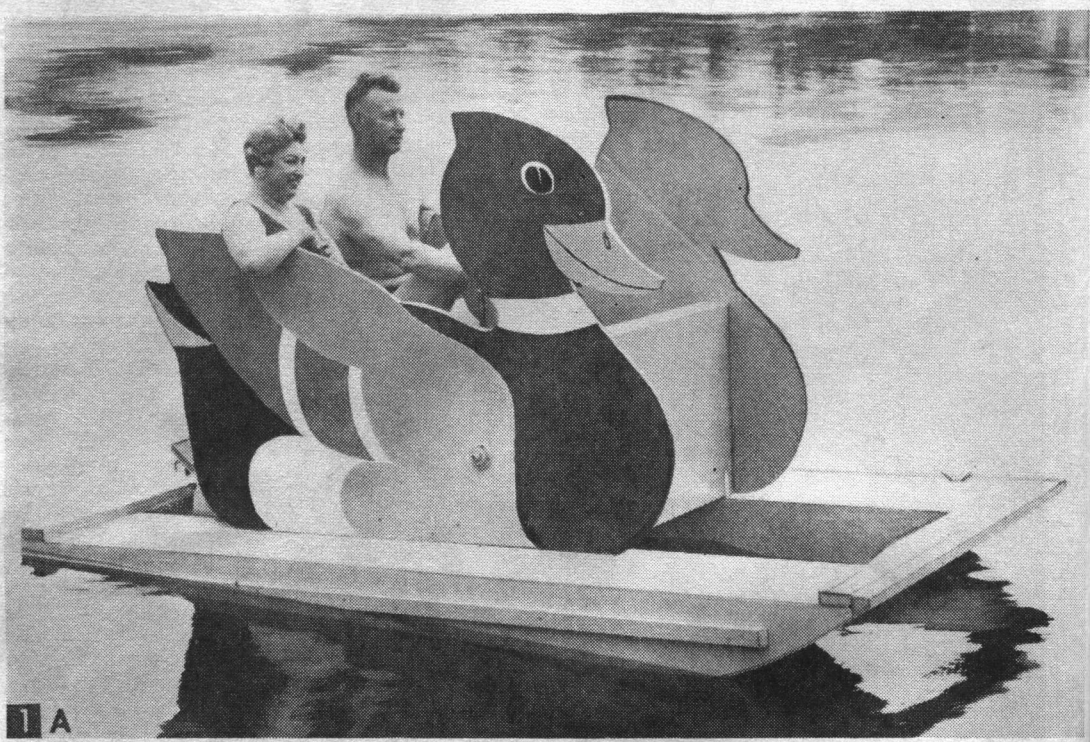
Build Marty-the Paddle-



1 A

Colorful appearance and pedal operated paddle wheels keep Marty's admirers standing in line for another ride

By ED HAMILTON

If you can get Marty away from the kids for awhile, you'll enjoy using it as much as they will and get your exercise at the same time.



B

Craft Print Project No. 322

YOU may want just one of these paddle-wheel fun-abouts to help the children enjoy their vacation and to take you and Mom down the shore in the evening to visit vacation-land neighbors. Or, you may decide to build a flock of these attractive ducks to brighten up your resort—and its bank account too.

In either case, you'll find that Marty is especially safe for children because of built-in *Styrofoam* flotation that will support 1000 lbs. by itself. And, also, that the construction is easy on the pocketbook because it does not require marine-grade lumber, paint, or fastenings.

Begin Construction by laying out and cutting one of the pontoon sides to shape (Fig. 3A) on a bandsaw. Use knot-free pine or fir, or, if you wish, you can order and use 10-ft. lengths of AC-grade exterior fir plywood. Use the first side as a pattern to lay out three more identical pieces.

Next cut seven 16½-in. cross frames and a nose piece (Fig. 3) for each pontoon. Use a waterproof glue and flathead (*fh*) wood-screws to assemble the sides and cross frames

Wheeling Mallard

as in Fig. 2A. Set the nose piece in place temporarily and trace the curve of the sides on each end of it. Then set your bandsaw table at an angle to rough out the nosepieces and finish them with a wood rasp after assembly.

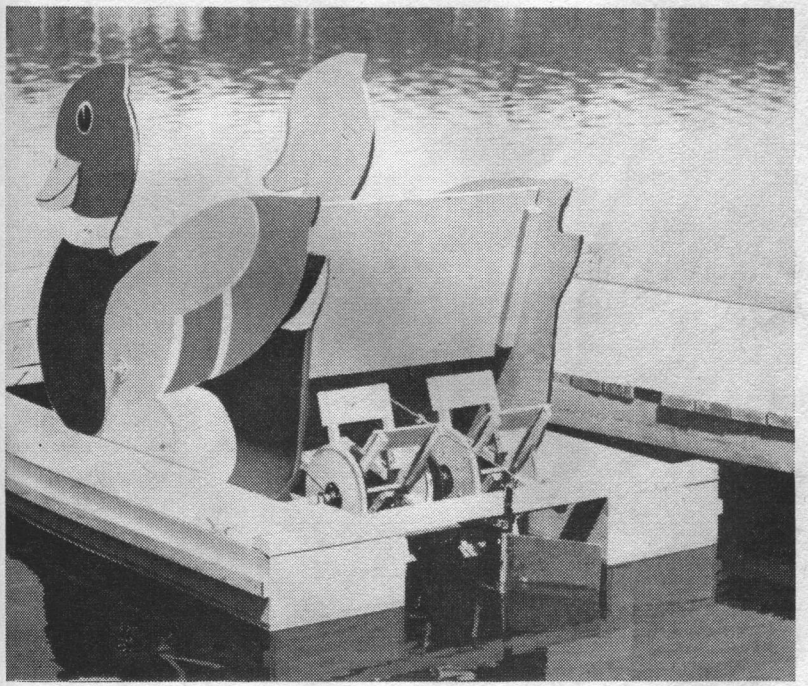
Cut the 18-in.-wide bottom planks (Fig. 2A) for each pontoon from ¼-in. plywood. To use stock 8-ft. lengths of plywood, splice the bottom planks at the centerline of any cross frame. Coat the mating surfaces of the planks, framing, and sides with glue and attach the planks, best-side outside, using #8 x 1-in. *fh* woodscrews spaced 3 in. apart. Lubricate the threads of the screws with bar soap and use a push-type screwdriver, if available, to drive the screws. Set the heads about 1/32 in. below the surface to allow them to be concealed with wood putty before painting.

When the bottom plank is in place, give the interior a coat of sanding sealer such as *Firzite,* being careful to avoid coating areas that are to be glued later.

For maximum safety, you can now place a 7 x 20-in. x 9-ft. billet of Styrofoam (Fig. 4) in each hull, sliding it through the transom opening. These foamed-plastic billets will add structural strength to the pontoons and, even in the case of damage to both hulls, will support many times the weight of two adults.

When finished, attach the top plank in the same way as you did the bottoms. Then lay out the transoms (Fig. 2A) by tracing the outline of the stern opening of each pontoon on ¾-in. plywood and cut and attach them.

Next, join the pontoons with two 66-in. lengths of 2 x 4 stock. Drill 3/16-in. lead holes at an angle from each edge of the crossmembers as in Fig 6A and secure them with glue and #12 x 2¼-in. *fh* screws. Install the forward crossmember (Fig. 3B) after beveling it to match the curve of the pontoons.

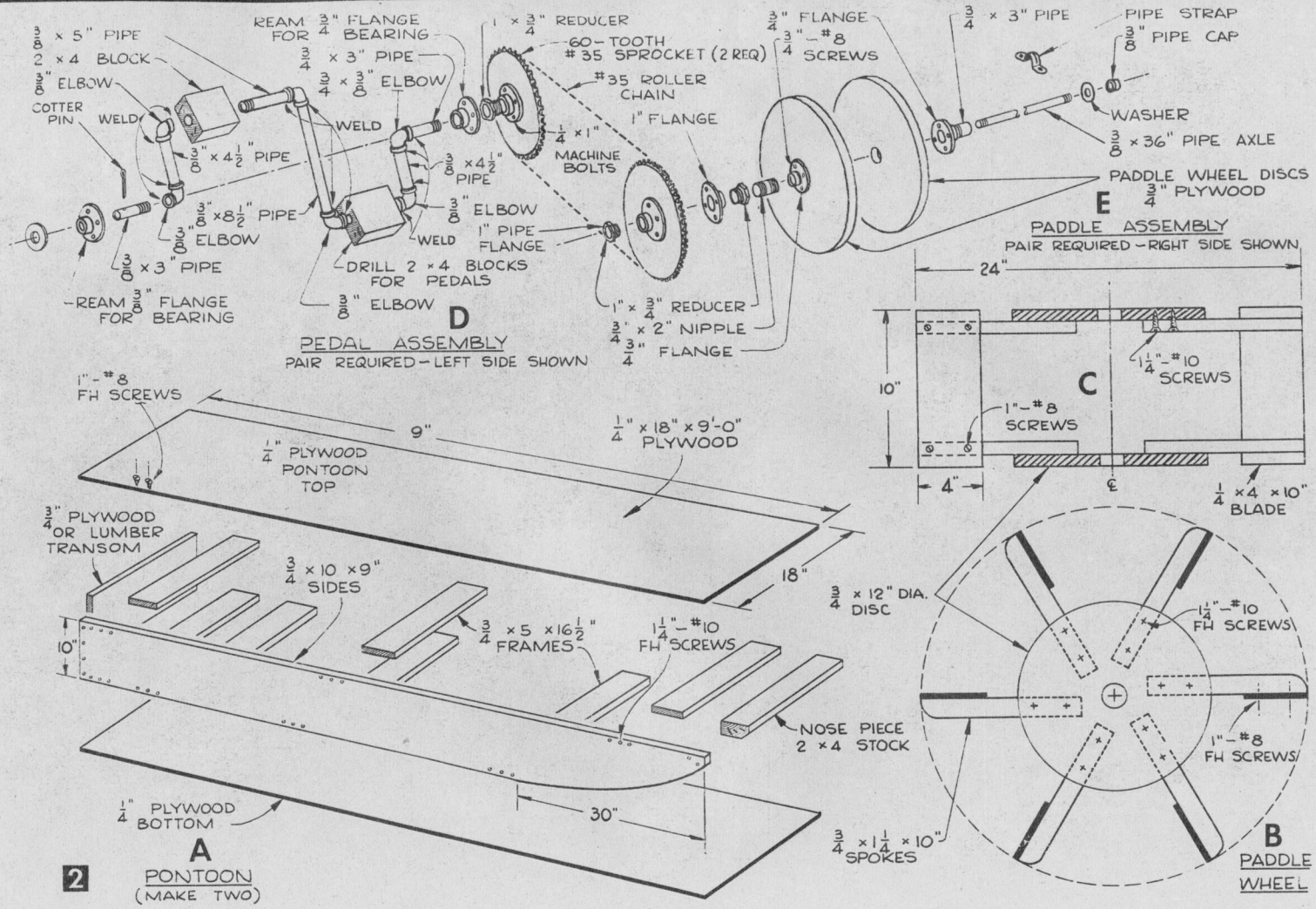


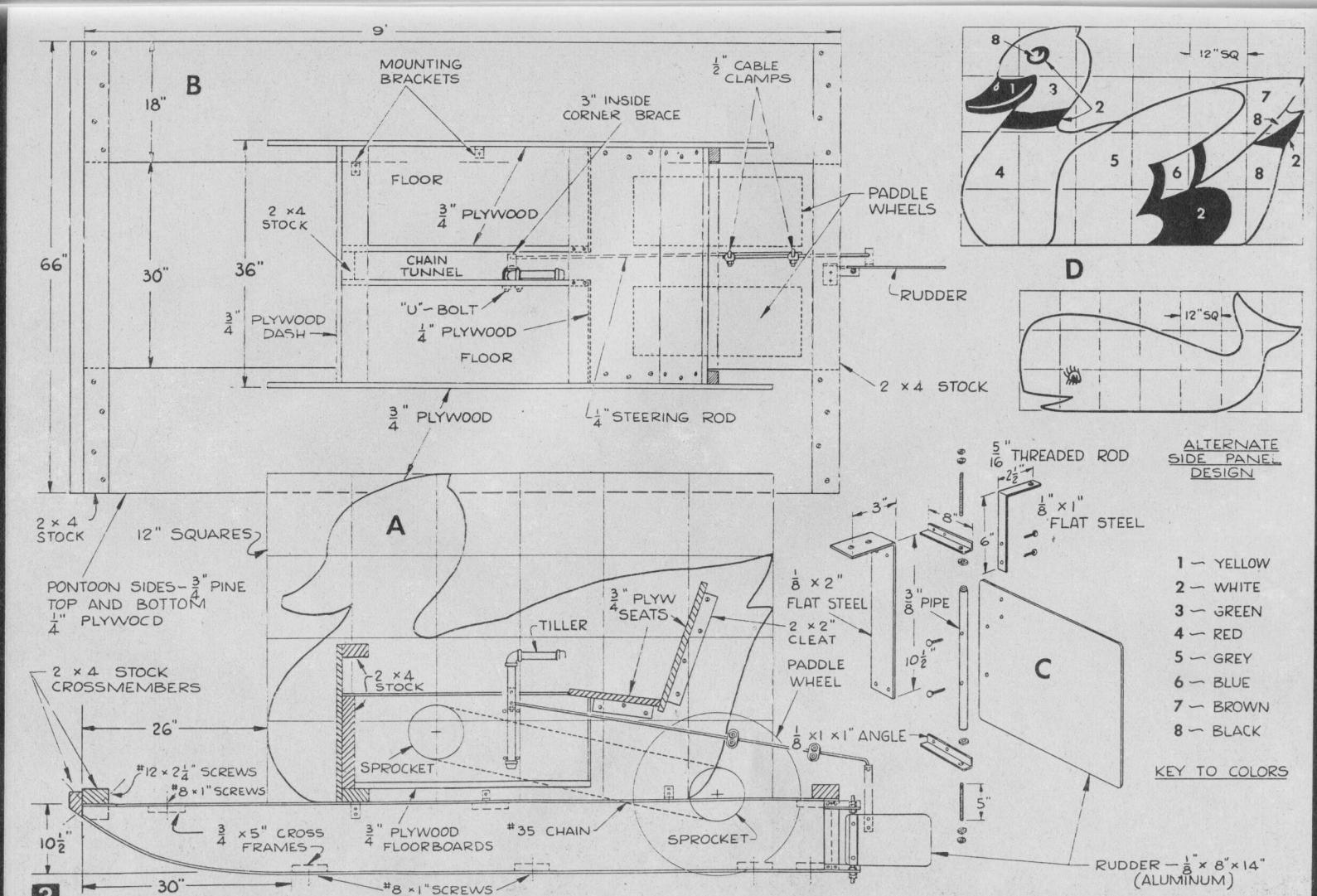
Give the entire assembly a coat of sanding sealer and, when dry, two coats of your choice of porch-and-deck enamel.

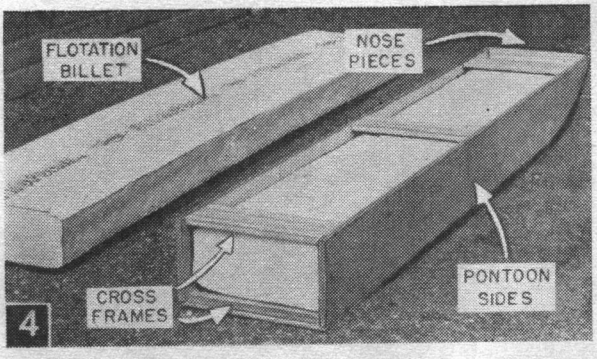
Paddle Wheels. Lay out and cut the four paddle-wheel discs (Fig. 2B) from ¾-in. plywood and drill a ¾-in. hole in the center of each. Then cut the hardwood spokes (Fig. 2) and the ¼-in. plywood blades (Fig. 2C). Assemble these parts with glue and use #10 x 1¼-in. *fh* screws to join the discs and spokes and #8 x 1-in. screws to attach the blades.

Seal and paint the paddle-wheel assemblies before further assembly in the same way as you did the pontoons. When dry, center and attach a ¾-in. pipe flange over the axle holes on each side of the paddle wheels.

Also attach a 1-in. pipe flange to each side of the paddle wheel sprocket with machine bolts, hacksawing the excess length from the bolts and peening them slightly to prevent loosening. Complete the paddle-wheel assembly as in Fig. 2E, adding a reducing bushing and a 2-in. nipple to each side of the sprocket before attaching the paddle wheels. Screw a 4- to 5-in. length of ¾-in. pipe into the flanges on the outboard side of each wheel and cut these to fit inside the inner


3/8 x 5" PIPE
2 x 4 BLOCK
3/8" ELBOW
COTTER PIN
WELD
3/8 x 4 1/2" PIPE
3/8" x 8 1/2" PIPE
3/8" ELBOW
3/8 x 3" PIPE
REAM 3/8" FLANGE FOR BEARING
REAM 3/4" FLANGE FOR BEARING
3/4 x 3" PIPE
3/4 x 3/8" ELBOW
WELD
3/8 x 4 1/2" PIPE
3/8" ELBOW
1" PIPE FLANGE
DRILL 2 x 4 BLOCKS FOR PEDALS
3/8" ELBOW
D
PEDAL ASSEMBLY
PAIR REQUIRED - LEFT SIDE SHOWN
1 x 3/4" REDUCER
60-TOOTH #35 SPROCKET (2 REQ)
#35 ROLLER CHAIN
1/4 x 1" MACHINE BOLTS
1" FLANGE
1" x 3/4" REDUCER
3/4" x 2" NIPPLE
3/4" FLANGE
3/4" FLANGE
3/4" - #8 SCREWS
3/4 x 3" PIPE
PIPE STRAP
3/8" PIPE CAP
WASHER
3/8 x 36" PIPE AXLE
PADDLE WHEEL DISCS 3/4" PLYWOOD
E
PADDLE ASSEMBLY
PAIR REQUIRED - RIGHT SIDE SHOWN
24"
10"
1 1/4" - #10 SCREWS
1" - #8 SCREWS
C
4"
1/4 x 4 x 10" BLADE
1" - #8 FH SCREWS
1/4" PLYWOOD PONTOON TOP
9"
1/4" x 18" x 9'-0" PLYWOOD
3/4" PLYWOOD OR LUMBER TRANSOM
3/4 x 10 x 9" SIDES
18"
10"
3/4 x 5 x 16 1/2" FRAMES
1 1/4" - #10 FH SCREWS
NOSE PIECE 2 x 4 STOCK
1/4" PLYWOOD BOTTOM
30"
A
PONTOON
(MAKE TWO)
2
3/4 x 12" DIA. DISC
1 1/4" - #10 FH SCREWS
1" - #8 FH SCREWS
3/4 x 1 1/4 x 10" SPOKES
B
PADDLE WHEEL


9'
B
18"
66"
30"
36"
MOUNTING BRACKETS
3" INSIDE CORNER BRACE
½" CABLE CLAMPS
FLOOR
¾" PLYWOOD
2 x 4 STOCK
PADDLE WHEELS
CHAIN TUNNEL
"U"-BOLT
¼" PLYWOOD
FLOOR
¾" PLYWOOD DASH
RUDDER
2 x 4 STOCK
¾" PLYWOOD
¼" STEERING ROD
2 x 4 STOCK
12" SQUARES
A
PONTOON SIDES-¾" PINE TOP AND BOTTOM ¼" PLYWOOD
2 x 4 STOCK CROSSMEMBERS
26"
#12 x 2½" SCREWS
#8 x 1" SCREWS
¾ x 5" CROSS FRAMES
¾" PLYWOOD FLOORBOARDS
#35 CHAIN
SPROCKET
SPROCKET
10½"
30"
#8 x 1" SCREWS
TILLER
2 x 4 STOCK
¾" PLYW SEATS
⅛ x 2" FLAT STEEL
2 x 2" CLEAT
PADDLE WHEEL
⅛ x 1 x 1" ANGLE
5/16" THREADED ROD
2½"
⅛" x 1" FLAT STEEL
3"
8"
6"
⅜" PIPE
10½"
5"
C
RUDDER — ⅛" x 8" x 14" (ALUMINUM)
8
1
3
2
12" SQ
7
8
2
4
5
6
8
2
D
12" SQ
ALTERNATE SIDE PANEL DESIGN
1 — YELLOW
2 — WHITE
3 — GREEN
4 — RED
5 — GREY
6 — BLUE
7 — BROWN
8 — BLACK
KEY TO COLORS

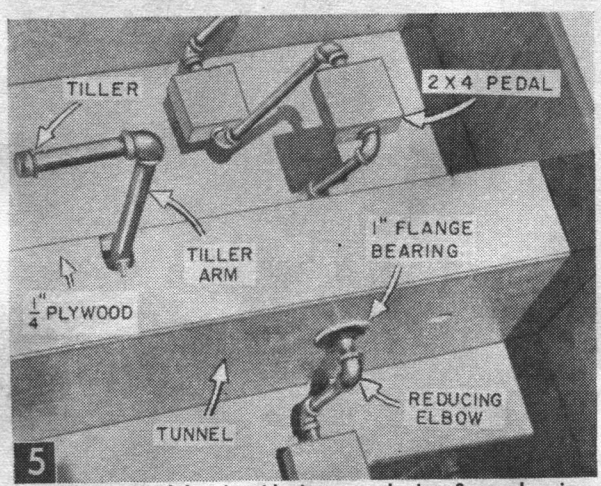


For added safety, nine-cubic-foot foamed-plastic billet may be inserted through stern opening of each pontoon before attaching transoms.

each end, and then secure the axle (Fig. 6A) with pipe straps. Mount the paddle wheels so the blades clear the rear crossmembers by 1 in.

Body Construction. Lay out the ¾-in. plywood sides, transferring the pattern in Fig. 3A by means of 12-in. squares. Cut the sides to shape and then lay out the position of the seats, seat cleats, and 2 x 4 body framing as in the squared patterns. Assemble these parts with glue and woodscrews and fasten the plywood dash (Fig. 3) to the framing. Cut a 14-in. length of 2 x 4 stock and fasten this to the inside center of the dash on top of the lower body frame. The floor panels fit between this vertical frame and the body sides.

Next cut and temporarily attach the plywood tunnel sides and drill a ¾-in. hole for the pedal assembly as in Fig. 3A, extending it through the body and the tunnel sides. Then permanently attach the tunnel sides with woodscrews, running some of the screws through the floor panels and seat. Close up the space beneath the seat at the rear of the floor boards with ¼-in. plywood kick-boards.



Welded pipe pedal units ride in reamed pipe flange bearings mounted on each side of the chain tunnel.

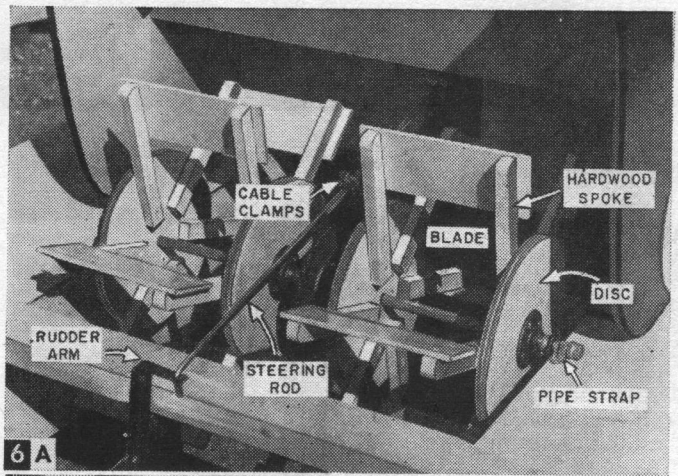
Pedal Assembly is made up by first threading a 1-in. to ¾-in. reducer into the flanges on each side of the sprockets. Then hold the sprocket up in the well while you screw a 3-in. length of ¾-in. pipe into each reducer through the holes in

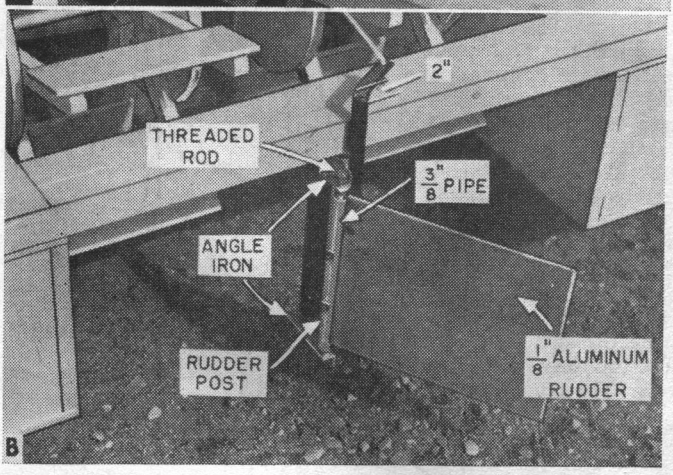
edges of the pontoons.

Slide a length of ⅜-in. pipe (Fig. 2E) through the paddle-wheel assembly as an axle, placing a flat washer and pipe cap at

MATERIALS LIST—PADDLE-WHEEL DUCK

Amt. Req.	Size and Description	Use
	PLYWOOD	
3	¼" x 4 x 8' AC-EXT fir plywood	planking, paddles, tunnel top, kickboards
3	¾" x 4 x 8' AC-EXT fir plywood	body, floor wheels, seat and back, dash, tunnel sides, transoms
	LUMBER	
4	¾ x 11½" x 10' clear pine or fir	pontoon sides
2	¾ x 5½" x 10' clear pine or fir	cross frames
2	¾ x 1⅝" x 8' clear pine or fir	bumper strips
4	1⅝ x 3⅝" x 10" clear pine or fir	crossmembers, pedals, body framing
1	¾ x 3⅝" x 10' oak or birch	paddle wheel spokes
	HARDWARE	
2	60-tooth, #35 sprocket (#6035)	paddle wheel drive sprockets
9 ft.	#35 roller chain with connector link	chain drive
	Above available from Neilson Wheel Co., 1603 No. 27th St., Milwaukee 8, Wis.	
4	1" pipe flanges	sprocket carriers
4	1" to ¾" reducing bushings	sprocket-to-pedal adaptors
6	¾" pipe flanges	paddle wheel adaptors
2	¾ x 2" pipe nipples	paddle wheel bearings
1	½", 90° elbow	tiller connection
3 ft.	½" pipe	tiller
2	½" pipe caps	tiller caps
2	⅜" flanges	axle bearings
10	⅜" 90° elbows	pedal assembly
2	⅜" pipe caps	pedal assembly
10 ft.	⅜" pipe	pedal assembly
4	¾" pipe straps	axle mounts
2	1 x 1½" U bolts	tiller mounts
7	3"-90° angle brackets	body mounts
2	½" cable clamps	tiller rod clamps
2	¼" dia. x 3' steel rod	tiller rod
1	⅛ x 12 x 9" aluminum	rudder
1	⅛ x 1 x 8" steel h.r. steel	rudder arm
1	⅛ x 2 x 14" steel h.r. steel	rudder post
2	⅛ x 1 x 1 x 8" angle iron	rudder mount
2	5/16" dia. x 5" threaded rod	rudder pivots
2	4" awning cleats	tie-up cleats
1	⅜ x 3" eyebolt	mooring eye
2 gr.	1" #8 fh (flathead) brass or galvanized screws	
1 gr.	1" #10 fh brass or galvanized screws	
48	1¼"-#10 fh brass or galvanized screws	
14	¼ x 1" machine screws, nuts and flat washers	
2	5/16 x 3½" carriage bolts, nuts and flat washers	
2	7 x 20" x 9' Styrofoam billets	
	Available from Northwestern Asbestos and Cork Insulation Co., Box #521, Green Bay, Wis., $16.50 each, F.O.B. Green Bay, Wis.	
1 pt.	waterproof glue (Weldwood)	
1 gal.	porch-and-deck enamel	
1 gal.	sanding sealer (Firzite)	





Paddle-wheel assembly is mounted on pontoons with pipe straps so paddles clear aft crossmember by 1-in. Rudder assembly is carried on flat steel post screw-fastened to underside of crossmember.

the tunnel sides. Ream two ¾-in. flanges (Fig. 5) to be bearings for these pipes and fasten the flanges to the outside of the tunnel. Continue assembling the pipe parts for the pedals as in Fig. 2D.

When all except the outboard lengths of ⅜-in. pipe are assembled, have the joints welded to prevent loosening or turning. When this is finished, screw the pedals on to the pipe stub projecting from each side of the tunnel (Fig. 5). Finally, thread the outer stub through the body side into the welded pedal assembly. Ream another pair of flanges and fasten them to the outside of the body as bearings for the outer ends of the pedal units and secure these with flat washers and cotter pins.

Assembly. Set the body in place on the pontoons and install the chain on the sprockets. Remove some of the links, if necessary, so the forward edge of the body is approximately 26 in. back from the nose of the pontoons (Fig. 3A). Now slide the body forward until only 1 or 2 in. of slack remain in the chain. Mark this position and then secure the body to the pontoons with 3-in., 90° angle brackets. Space three of these on each side so they fasten to the pontoon cross frames or sides.

Steering. Bend a ⅛ x 2 x 14-in. piece of flat steel to form the rudder post (Fig. 3C) and bolt this to the underside of the rear crossmember, centering it between the paddle wheels. Bolt short pieces of angle iron to the post and drill these for the threaded-rod rudder mounts (Fig. 6B).

Bolt an 8-in. length of ⅜-in. pipe to the ⅛-in. sheet aluminum rudder (Fig. 3C) and then pivot this assembly between the pieces of threaded rod. Bend another piece of flat steel and bolt it to the rudder as a rudder arm so the horizontal portion is 2 in. above the top of the rear crossmember (Fig. 6B).

For the tiller (Fig. 3A), use a 6- and a 24-in. length of ½-in. pipe joined with a 90° elbow and having pipe caps on the open ends. Attach this to the right inside surface of the tunnel (Fig. 3B) with a pair of U bolts positioned so the tiller arm will prevent the tiller from falling and the lower pipe cap will prevent it from rising. Bolt the tiller arm in place and then attach the control rod, using flat washers and cotter pins to secure it in the arms. Set the tiller and the rudder for straight forward running and then tighten the cable clamps (Fig. 6A), over the rods. After assembly the tunnel is closed with a ¼-in. plywood cover (Fig. 5).

Painting. Next lay out and paint the body sides, following the squared diagram (Fig. 3D). Use outdoor paints and brilliant colors for an attractive appearance.

Finally, complete Marty by adding a pair of 4-in. cleats, a ⅜-in. eyebolt, and ¾-in. wooden bumper strips (Fig. 1).

● Craft Print No. 322 in enlarged size for building Marty the Paddle-Wheeling Mallard is available at $1.50. Order by print number. To avoid possible loss of coin or currency in the mails, we suggest you remit by check or money order (no CODs or stamps) to Craft Print Dept. 2196, SCIENCE and MECHANICS, 505 Park Ave., New York 22, N. Y. Now available, our new illustrated catalog of "194 Do-It-Yourself Plans," 25¢ (refundable, first order). Please allow three to four weeks for delivery.


1 A