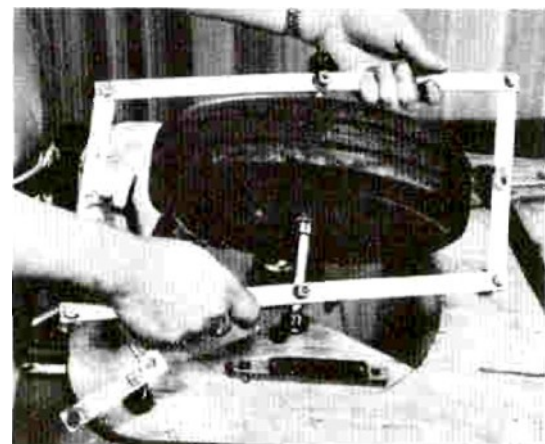


# Build an electric Scoot-car



Designed by ROBERT WOOLSON

Here's a sidewalk special for young hot rodders that safely takes the corner on two wheels, has two forward speed and brakes that stop on a dime

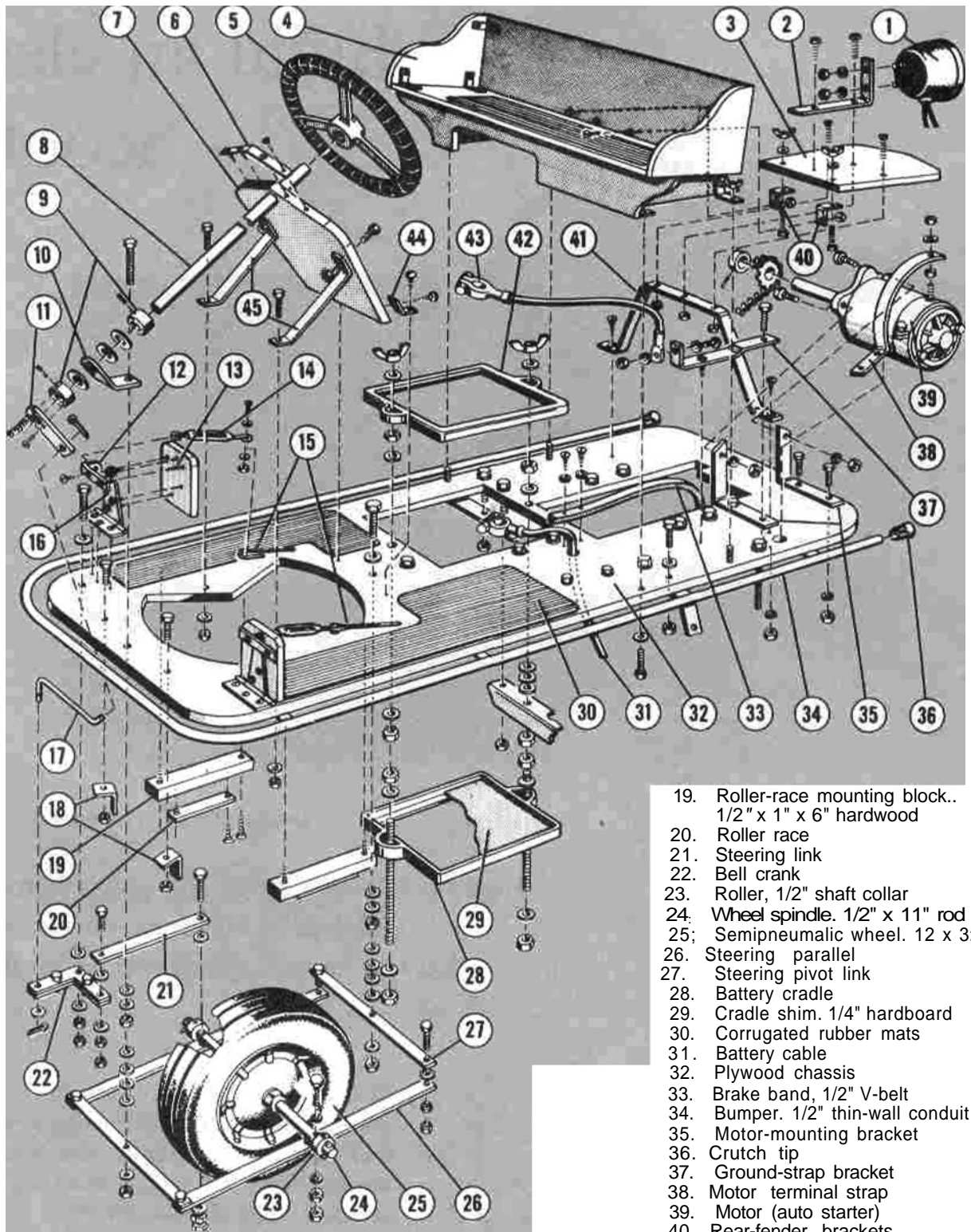


This is the parallel-arm steering gear being placed in position. Pivot links are bolted to the deck, using washers and lockouts

- ONE FULL BATTERY CHARGE readies Scoot-car for hours of fun. Cornering wheels, one on each side of the chassis, give the driver sure stability from a standing start, and a near top speed of 10 to 12 miles per hour puts the car up on two wheels where it steers and controls like a car, but rides like a speedy low-slung scooter.

When cornering, the car leans over on one or the other of the outrider wheels, enabling the driver to keep safe, full control when turning. Power and brake application are controlled by pedals with strong return springs. Release the power pedal, hit the brake hard and Scoot-car stops within its length of 4 ft.

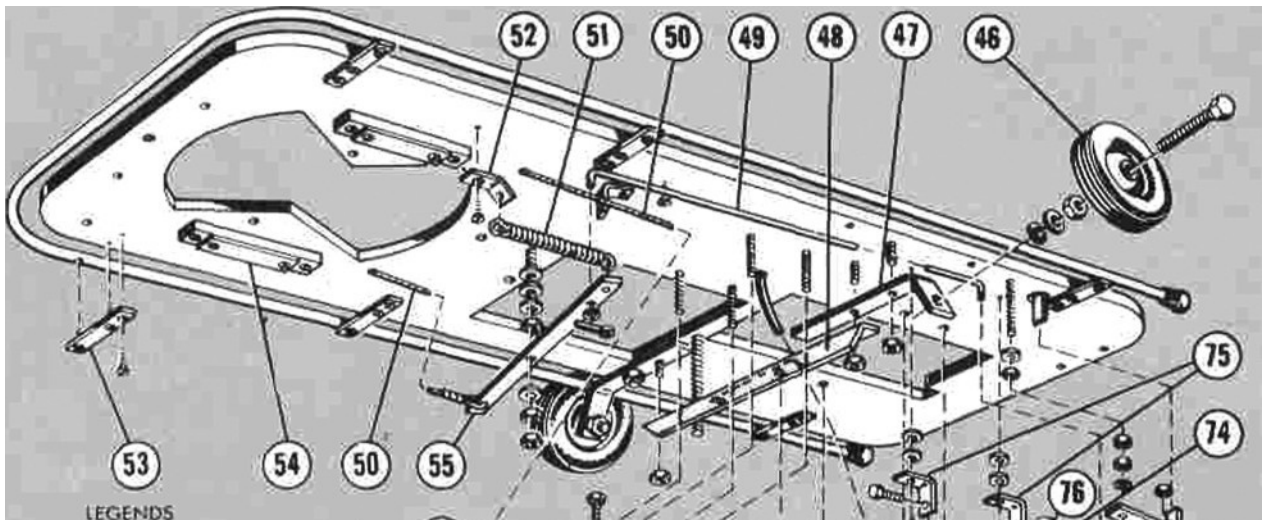
**Caution:** While Scoot-car is a safe toy



1. Taillight (optional)
2. Taillight bracket
3. Rear fender
4. Seat
5. Steering wheel
6. Front-fender trim (1/2"x1/2")
7. Front fender
8. Steering post, 1/2" x 25" rod
9. Shaft collar, 1/2" dia.

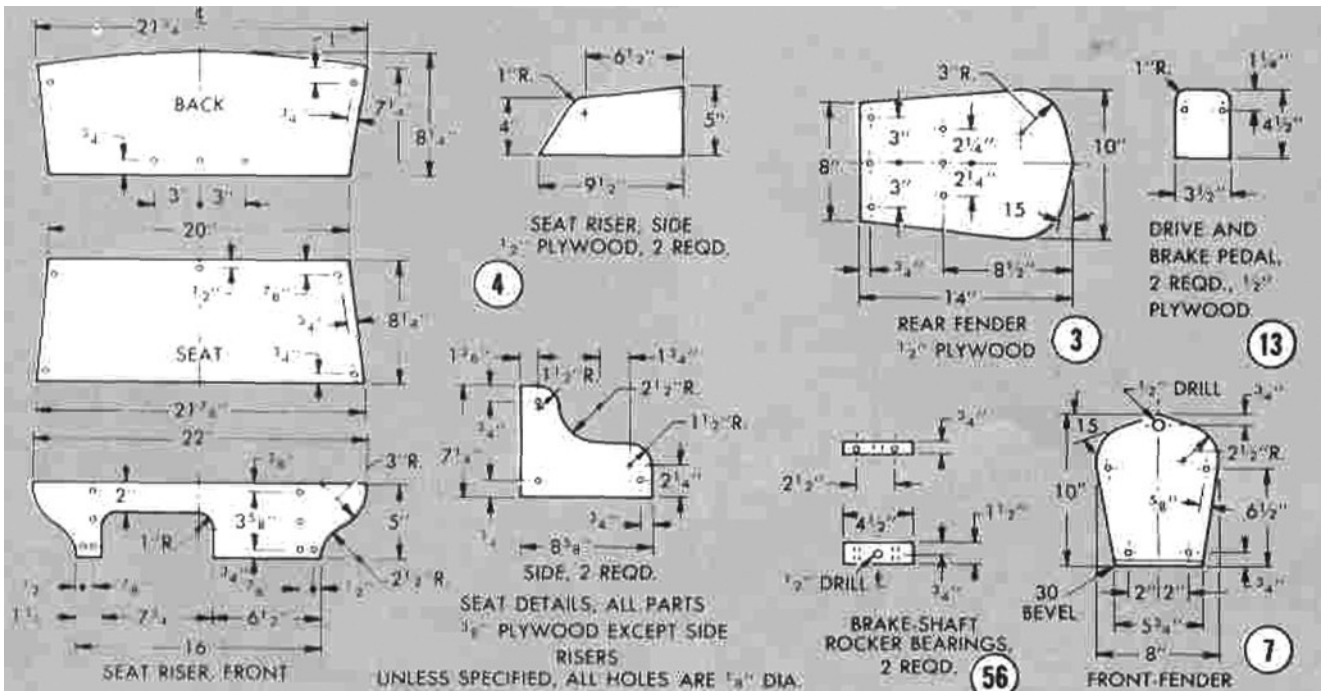
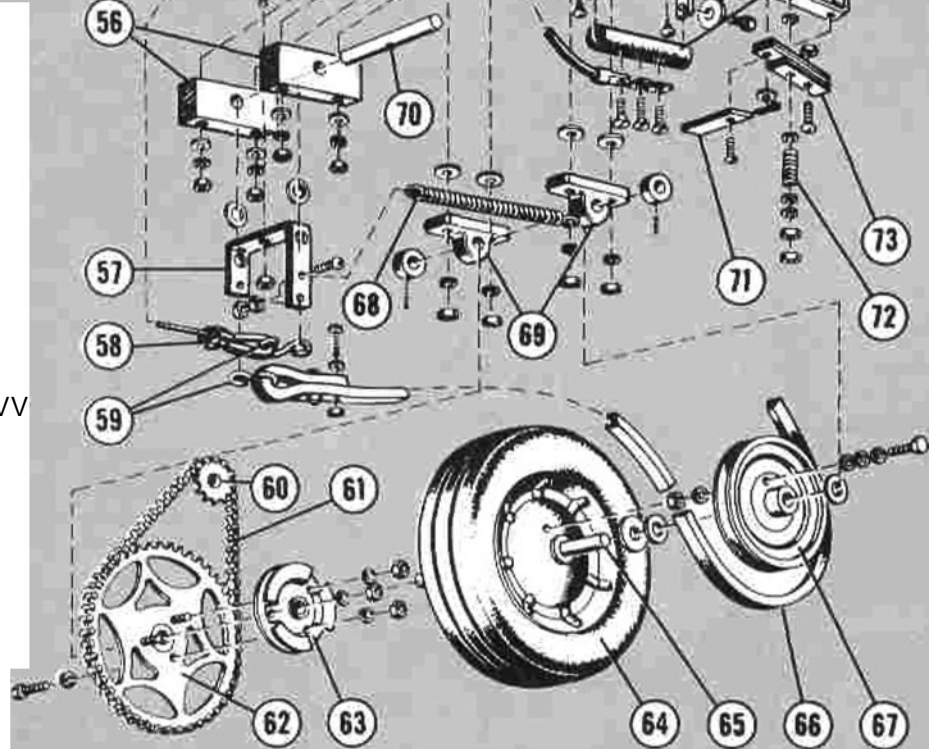
10. Lower bearing, steering post
11. Steering arm
12. Cable bracket
13. Drive pedal
14. Turnbuckle
15. Drive and brake cables
16. T-hinge, 3" leaf
17. Tie rod, 1/4" steel rod
18. Steering limit bracket. 1/8" x 1" flat steel

19. Roller-race mounting block. 1/2" x 1" x 6" hardwood
20. Roller race
21. Steering link
22. Bell crank
23. Roller, 1/2" shaft collar
24. Wheel spindle. 1/2" x 11" rod
25. Semipneumatic wheel. 12 x 3:00
26. Steering parallel
27. Steering pivot link
28. Battery cradle
29. Cradle shim. 1/4" hardboard
30. Corrugated rubber mats
31. Battery cable
32. Plywood chassis
33. Brake band, 1/2" V-belt
34. Bumper. 1/2" thin-wall conduit
35. Motor-mounting bracket
36. Crutch tip
37. Ground-strap bracket
38. Motor terminal strap
39. Motor (auto starter)
40. Rear-fender brackets
41. Rear-fender support
42. Battery cradle
43. Battery cable
44. Fender bracket
45. Fender brace
48. Semipneumatic wheel, 6 x 1:50
47. Wheel bracket
48. Chassis cross brace
49. Control rod (pedal to switch)
50. Drive and brake cables
51. Return spring

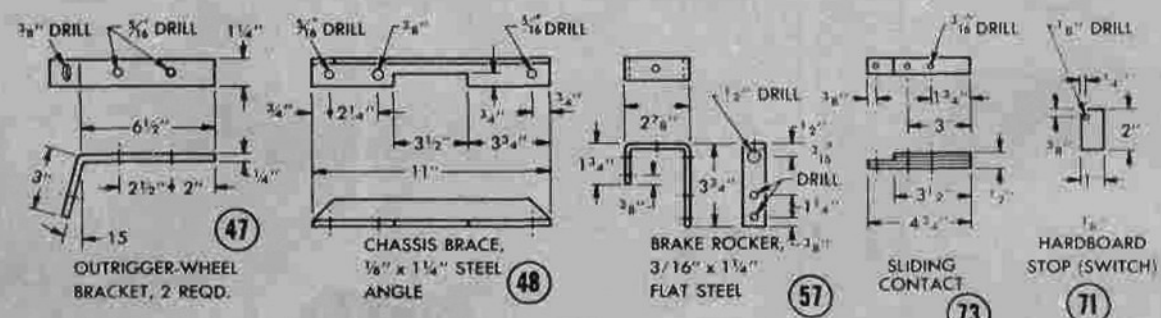
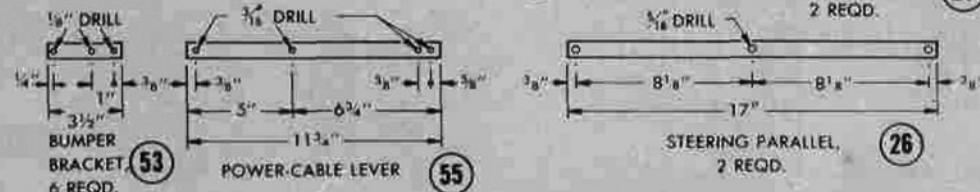
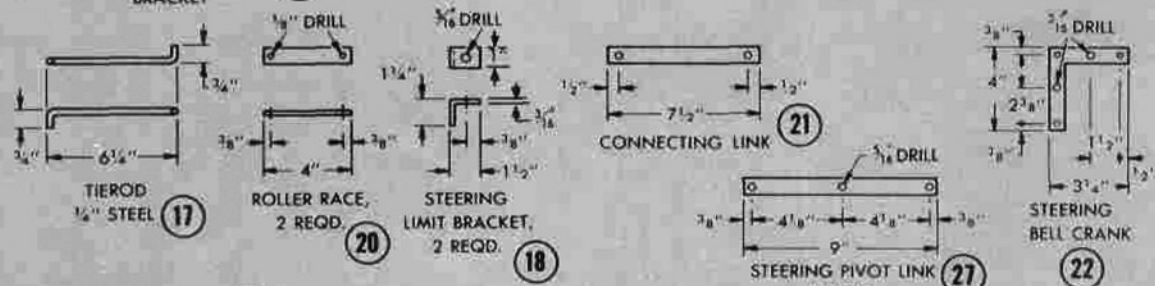
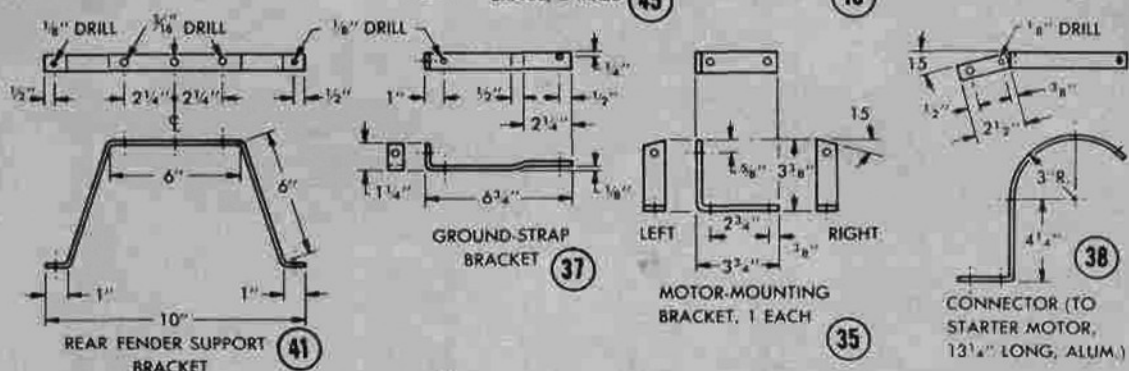
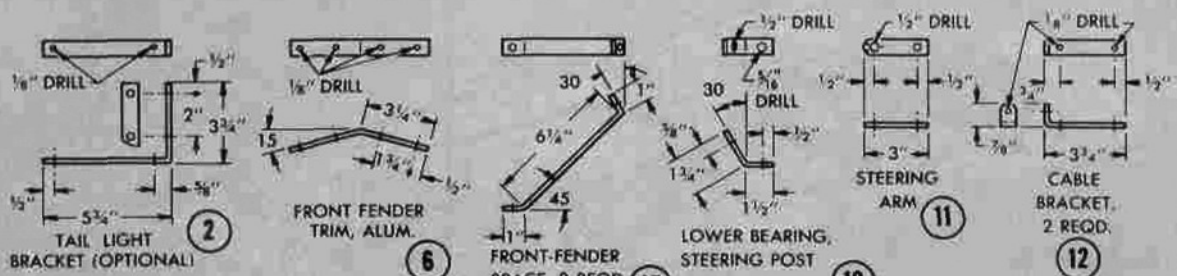


LEGENDS

- 52. Spring bracket
- 53. Bumper bracket
- 54. Roller-race assembly
- 55. power-cable lover
- 56. Roller-shaft bearings (hardwood)
- 57. Brake rocker, 1/8" x 1" steel
- 58. Cable clamp
- 59. S-hook, steel rod
- 60. 12-tooth drive sprocket
- 61. Roller chain
- 62. 52-tooth sprocket
- 63. Spacer, 4" V-pulley
- 64. Same as part # 25
- 65. Same as part #24. except 9VV
- 66. See part keyed #33
- 67. V-pulley. 6". brake drum
- 68. Return spring
- 69. Drive-wheel bearings
- 70. Brake rocker shaft, 1/2" x 4-3/4" steel shafting
- 71. Insulator. 1/8" hardboard
- 72. Compression spring
- 73. Sliding contact arm,
- 74. Carbon resistor
- 75. Resistor brackets
- 76. Retainer (large washer)

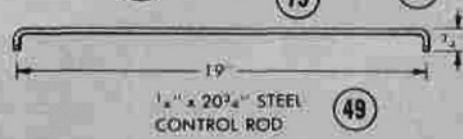






ALL PARTS SHOWN ARE CUT FROM 1/8\"/>

ALL HOLES ARE 1/4\"/>

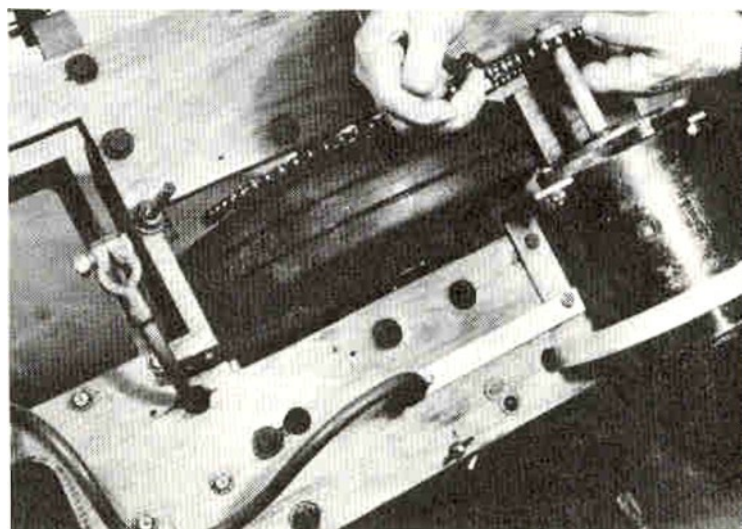




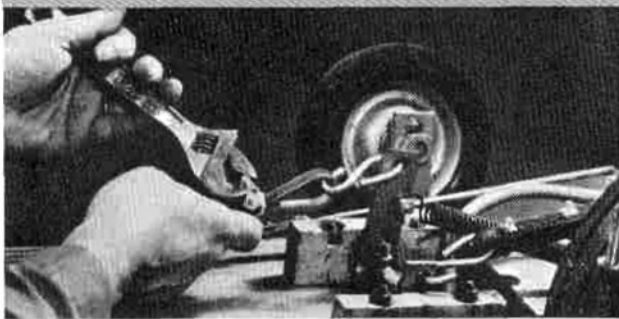
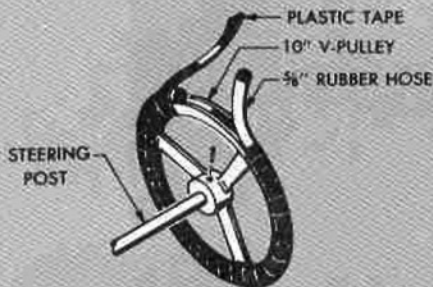
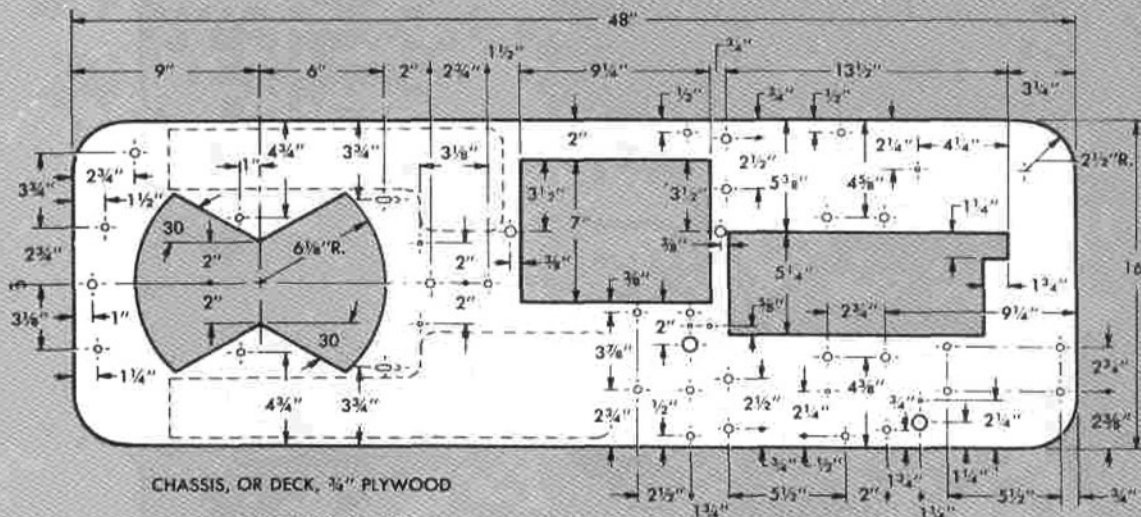
mechanically, there are precautions to observe when riding. When operating it for the first time, the immediate reaction to tipping is to take the feet off the pedals and plant them on the ground. With the car in motion, this can pitch the rider forward. The outrider wheels, of course, make tipping over impossible, and after a few trial spins, the rider will overcome the tendency to brace himself and will keep his feet on the pedals.

Looking over the details you will see that the Scoot-car has a unique parallel-arm steering gear and a positive roller-chain drive from an auto-starter motor. Throughout the construction, full use is made of standard, readily available parts and materials wherever possible. For example, the steering wheel is a 1.0-in.-diameter spoked V-pulley, wrapped with electrician's tape over a length of hose set into the V-rim of the pulley.

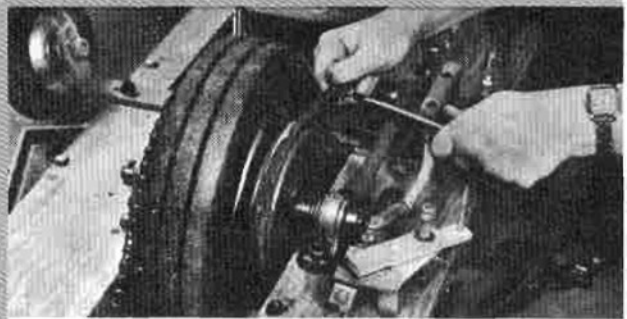
The roller-chain assures positive drive from the motor to the ground wheel. Slack in the chain should not exceed 1/2 in. Note the position of the battery cables and of the ground and power straps on the board







The brake cable is attached to the brake rocker with a cable eye and clamp. Note the end of the brake band bolted into a loop and attached to an S-hook



The free end of the V-belt brake band is bent back on itself to form a loop taking one eye of an S-hook. The loop is secured by two bolts

This makes a neat, attractive wheel of just the right size.

Make the plywood chassis (part No. 32) first, cutting the three openings for front and rear wheels and battery cradle as the first step. These openings should be cut just inside the pattern lines and then smoothed out to the lines with a wood rasp. Round corners slightly and sand smooth. Round the corners of the chassis to the radius indicated and sand all edges. Then lay out the hole pattern and centermark the location of holes with an awl. All smaller holes indicated are 1/4 in. in diameter. Those for the battery-cradle studs are 3/8 in. in diameter to take 3/8-in. threaded rod. Holes taking the rear-wheel bearing bolts are 5/16 in. in diameter and the two largest holes indicated take the battery cable and motor-terminal strap and are each 3/4 in. in di-

ameter. The two holes, indicated as elongated, take the brake and power-control cables and are drilled 1/4 in. in diameter and at as steep an angle as possible, then enlarged with a round file so that the cables clear without binding.

Next comes installation of front and rear wheels. Take the front wheel first and begin by noting closely the relationship of the parts. The parallels and the pivot links arc of flat steel (also often referred to as band iron) and are cut to length and drilled as detailed. The front wheel is centered on its spindle with shaft collars, and the outer ends of the spindle are carried on rollers, which are 1/2-in. shaft collars cotter-pinned on the shaft. The spindle is drilled just inside the collars (rollers) to take the 1/4-in. capscrews which hold the parallels to the shaft. One screw is longer to take the steering link. Spacer washers

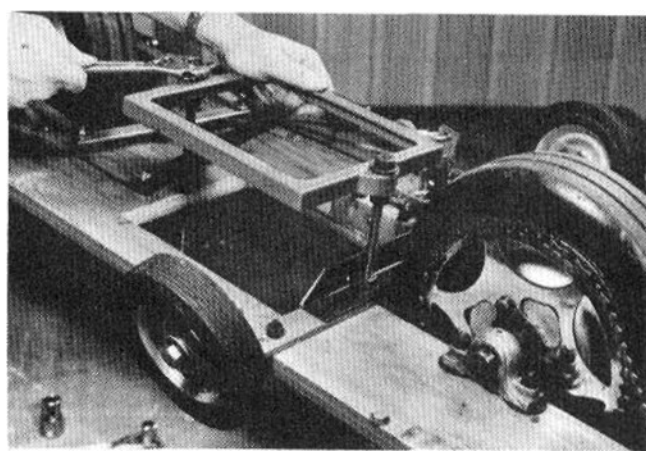
are placed between the joining parts and all screws carry additional washers and locknuts to permit free movement. In the assembly, the rollers on the ends of the wheel spindle ride on races made as shown. Each consists of a mounting block of hardwood and a facing of flat steel, and the two units are attached to the underside of the deck with wood screws. The pivot links are bolted to the underside of the deck and the steering, or connecting, link attaches to the bell crank. The latter is bolted to the underside of the chassis and the free arm takes the lower end of the tie rod when assembled. The upper end of the tie rod is attached to the steering arm on the lower end of the steering post. The steering arm is riveted to a shaft collar which provides a hub and a means of attaching to the steering post.

### rear wheel attached next

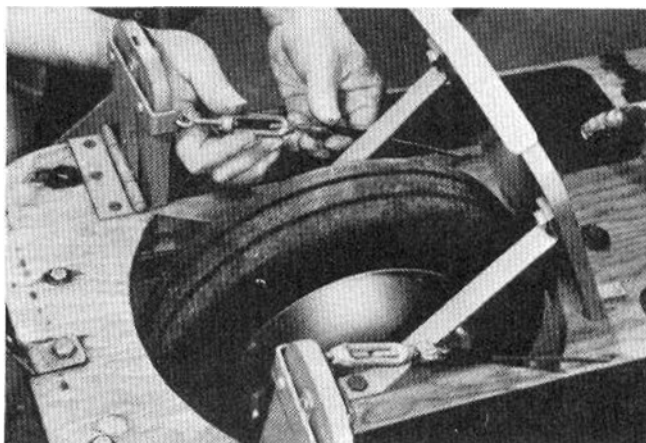
Now comes the rear wheel which is attached to the deck with two pillow-block bearings and carries the driven sprocket and brake drum. Notice especially the rear-wheel assembly. The brake drum is a V-pulley which slips onto the wheel spindle to which it is locked with its set-screw and additionally locked by a capscrew long enough to permit the threaded end to enter a hole drilled in the hub of the rear wheel. On the opposite side of the wheel a smaller V-pulley, with the rim cut away as indicated, serves as a spacer and a hub for the driven sprocket. It is locked to the hub of the rear wheel in the same manner as the brake drum. The brake band is a length of 1/2-in. V-belt, one end of which is attached to the top face of the deck with two wood screws. The other end is doubled back on itself to form a loop around an S-hook, the latter attaching to the brake arm.

The brake rocker is carried on a shaft supported in hardwood bearings bolted to the underside of the deck. The brake-return spring attaches to the long arm of the rocker and to one of the pillow-block bearing bolts. The second S-hook attaches to the long arm of the rocker and to a cable eye which connects to the 3/16-in. wire cable from the brake pedal. Note that turnbuckles are provided on both brake and power cables for adjustment.

The power-control cable reaches from the turnbuckle to one end of a pivoted lever. The other end of the lever connects to the control rod, part No. 49. The free end of the control rod is bent at right angles, drilled and cotterpinned to the sliding contact, part No. 73. The lever is returned by a spring, one end of which is hooked



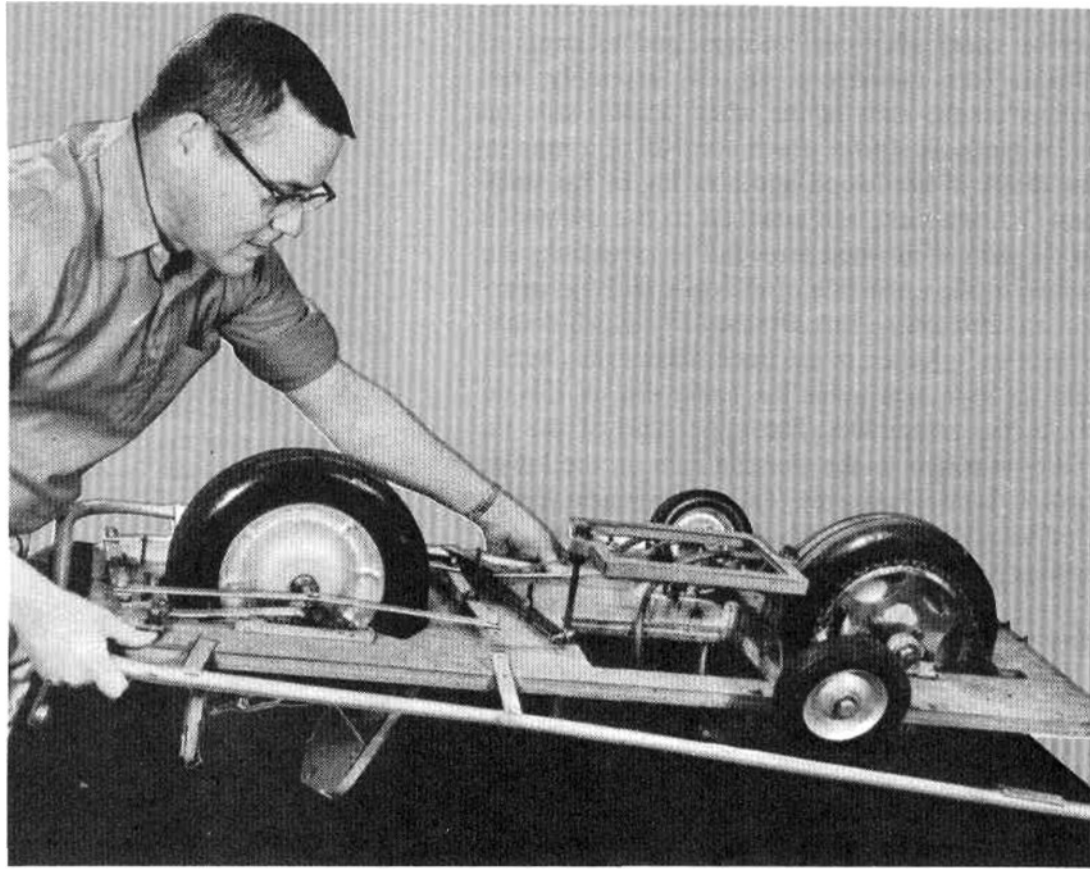
The lower half of the battery cradle or carrier is held in place by jam nuts. Be sure the nuts are tight



Turnbuckles provide adjustment on both the power and the brake cables

to a bracket screwed to the underside of the deck, see parts No. 51 and 52. The resistor, which is the carbon core from a dry cell, is mounted in brackets, parts No. 74 and 75, and is drilled and tapped for three 1/4-in. flat-head screws and two 1/4-in. capscrews, the latter holding it in place between the brackets. Drilling and tapping must be done with care, the tap holes being drilled slightly oversize so that the tap cuts only a 50- to 60-percent thread. One screw of the three shown takes the end of the battery cables, the other two, which are contacts through the resistor, are fitted with squares cut from 1/16 x 1/2-in. flat steel and center-countersunk to take the heads of the screws flush. In the off position the spring-loaded sliding contact arm contacts an insulating strip of hardboard, part No. 71, which is attached to the ground strap. This type of switch (in effect a rheostat) prevents heavy current surges and reduces arcing in the control switch to the minimum.

The motor-mounting brackets are made right and left and are so placed that the regular



*build a Scoot-car, continued*

mounting lugs on the motor can be utilized as fastenings. Note especially how the aluminum ground strap from the motor terminal is bent so that it passes through the large hole in the chassis, the lower end being held in place by the bolt on which the sliding contact pivots. It will be noted that there is an L-shaped retainer attached to one of the brackets supporting the resistor. This has been lowered in the photo for clarity. It has, however, been replaced by a large washer, part No. 76. This retainer prevents the insulator, part No. 71, from swinging.

All parts of the seat except the risers are made from 3/8-in. plywood and all parts are joined with 1 x 1 x 1/2-in. steel corner angles which are readily available. Care must be taken when locating the front and side risers to see that the holes in the attaching corner angles register with those in the deck to which the seat is attached with bolts and wing nuts. Note also that the inner end of the rear fender is attached to the back of the seat with corner angles, small bolts and wing nuts. The front fender is bracketed and braced to the deck and serves not only as a front-wheel fender, but also as a support for

the steering post, or column. The brake and power pedals consist of a 3-in. T-hinge and a pedal, or pad, of plywood, and a bracket which takes one eye of the turnbuckles. The hinge leaves are attached to the deck with wood screws.

The bumper is a length of 1/2-in. thin-wall conduit and is held in place with six flat-steel brackets screwed to the underside of the platform with wood screws and to the thin-wall conduit with self-tapping screws or sheet-metal screws. Rubber crutch tips are slipped on the open rear ends of the bumper. It may be attached either before or after the cornering wheels are in place. These wheels are carried at an angle of 15 deg. on heavy outrigger brackets bolted to the deck. Finally, install the steel-angle brace.

All that remains are installation of the battery cradle, the 6-v. battery and the foot and seat mats which are cut from corrugated-rubber stair treads and cemented to the deck. The taillight can be of the type pictured and detailed and wired into the power circuit, or you can use a battery-powered bike headlight and cover the lens with red cellophane. Also, you'll probably need to do some adjusting of the brake and power-cable turnbuckles to get the controls working right.