11 Slot Car Race Referee

☐ Build this optoelectronic judge and end forever those quarrels over who really won the race.

Install phototransistors Q1 and Q3 at the finish line, but in separate lanes of your slot-car track

PARTS LIST FOR SLOT CAR RACE REFEREE

C1—0.1-uF ceramic disc capacitor, 35-WVDC

IC1—7474 dual D-type flip-flop LED1, LED2—light-emitting diode

Q1, Q3-FPT-100 NPN

phototransistor

Q2, Q4-2N3904 NPN transistor

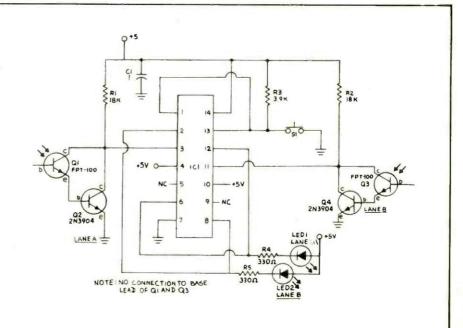
R1, R2—18K-ohm, ½-watt 10%

resistor

R3—3900-ohm, ½-watt 10% resistor

R4, R5—330-ohm, ½-watt 10% resistor

\$1—normally open SPST pushbutton switch



both Q1 and Q3; a small desklamp will work well, so that the light-sensitive face of each device is but ambient room light will usually suffice. Press facing upwards. The best method would be to cut S1 and both LEDs will go off. The first car to a small hole into the track for each cross the finish line interrupts the light beam and phototransistor, and mount each unit flush with causes the appropriate LED to light up. the track's surface. Arrange for light to fall on