

**FIGURE P12-12**

Problem 12-31 to 12-32

- †‡12-31 Figure P12-12 shows a fourbar linkage and its dimensions in inches. All links have a uniform 0.5-in wide x 0.2-in thick cross-section and are made from aluminum. Link 3 has squared ends that extend 0.25 in from the pivot point centers. Links 2 and 4 have rounded ends that have a radius of 0.25 in. Design counterweights to force balance the linkage using the method of Berkof and Lowen.
- †‡12-32 Use the data of Problem 12-31 to design the necessary balance weights and other features to completely eliminate the shaking force and shaking moment the linkage exerts on the ground link.

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† These problems are suited to solution using *Mathcad*, *Matlab*, or *TKSolver* equation solver programs. In most cases, your solution can be checked with program FOURBAR,