



**FIGURE P4-14**

**Problem 4-28**

- †4-28 For the rocker-crank linkage in Figure P4-14, find the maximum angular displacement possible for the treadle link (to which force  $F$  is applied). Determine the toggle positions. How does this work? Explain why the grinding wheel is able to fully rotate despite the presence of toggle positions when driven from the treadle. How would you get it started if it was in a toggle position?

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\* This figure is provided as an animated Working Model file on the CD-ROM. It is the same file as that for Figure P3-03.

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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, SLIDER, or SIXBAR.