



Figure 7.28

**Problem 7.18** A square loop, side  $a$ , resistance  $R$ , lies a distance  $s$  from an infinite straight wire that carries current  $I$  (Fig. 7.28). Now someone cuts the wire, so that  $I$  drops to zero. In what direction does the induced current in the square loop flow, and what total charge passes a given point in the loop during the time this current flows? If you don't like the scissors model, turn the current down *gradually*:

$$I(t) = \begin{cases} (1 - \alpha t)I, & \text{for } 0 \leq t \leq 1/\alpha, \\ 0, & \text{for } t > 1/\alpha. \end{cases}$$

**Problem 8.6** A charged parallel plate capacitor of width  $l$  and length  $L$  is shown in Fig. 8.6. The top plate is at a potential  $V_0$  and the bottom plate is at a potential  $0$ .