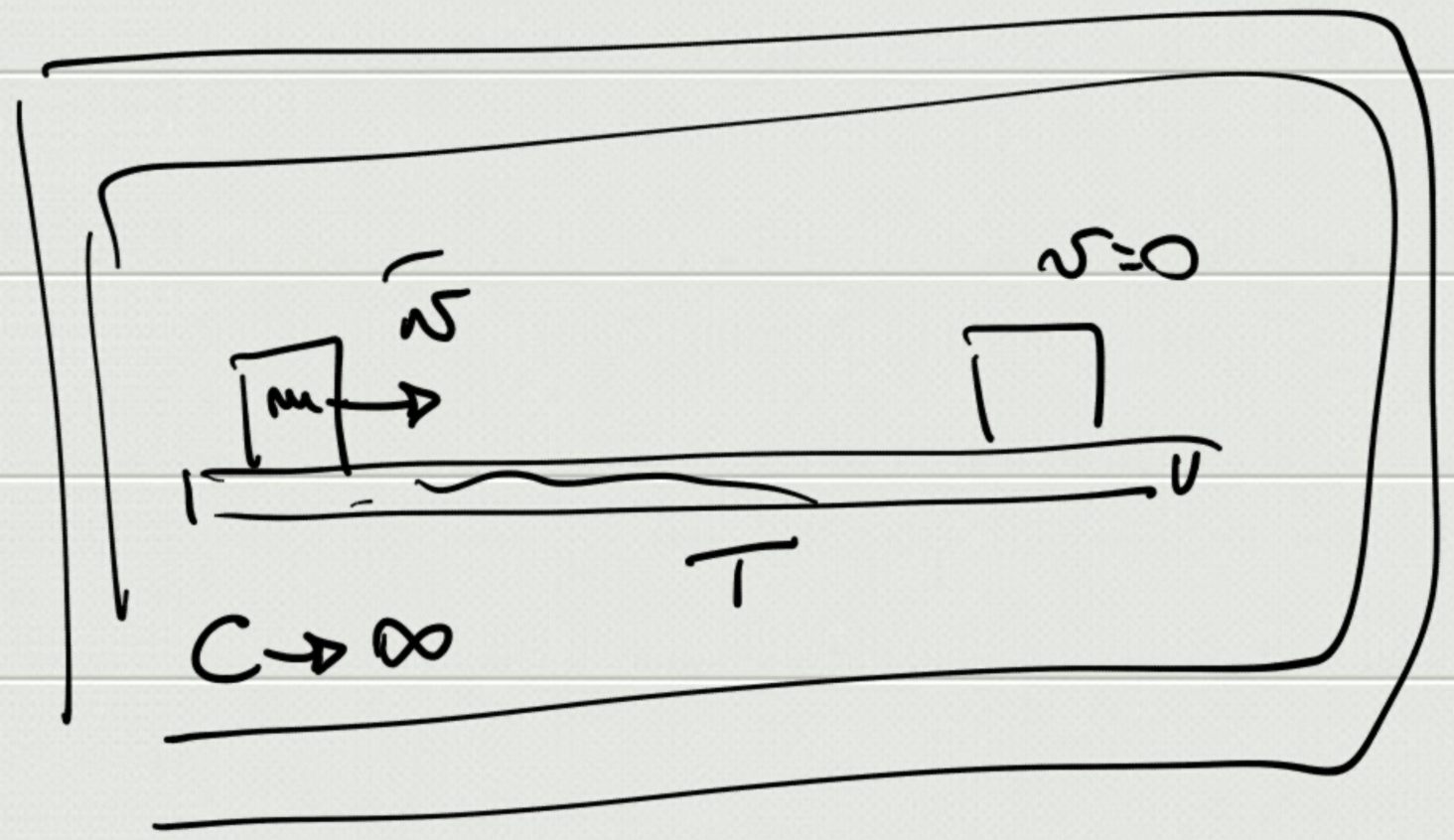


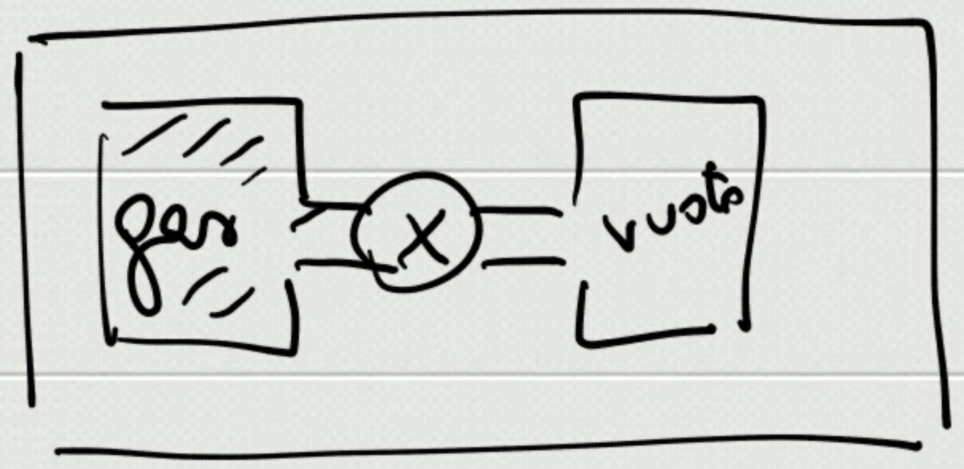
$$E_K = \frac{1}{2} m v^2$$

$E_K \rightarrow Q$

$$\Delta S_U = \frac{Q}{T} = \frac{E_K}{T}$$

$W_{Rev} = E_K$ $\qquad$ $W_{irrev} = 0$

$$W_{rev} - W_{irrev} = E_K = Q = T \Delta S_U$$



isoterma irrev.

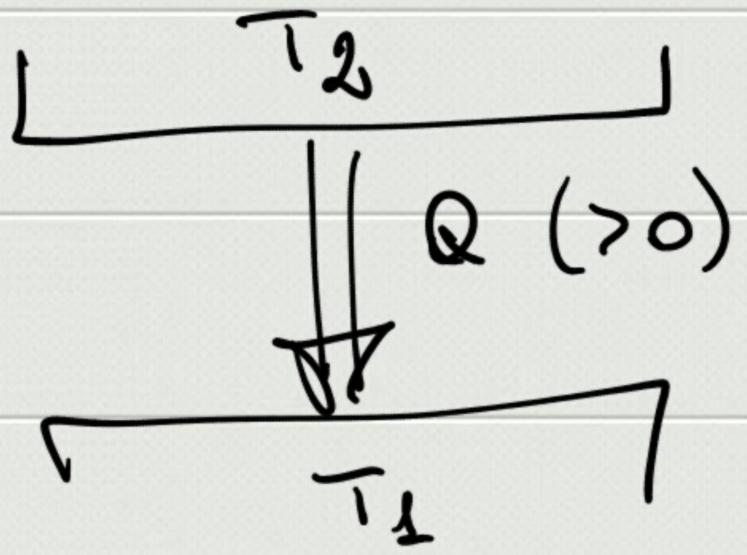
$$\Delta S_U = \Delta S_{gas} = nR \ln \frac{V_{fin}}{V_{in}}$$

$$W_{irrev} = 0$$

$$W_{rev} = nRT \ln \frac{V_{fin}}{V_{in}}$$

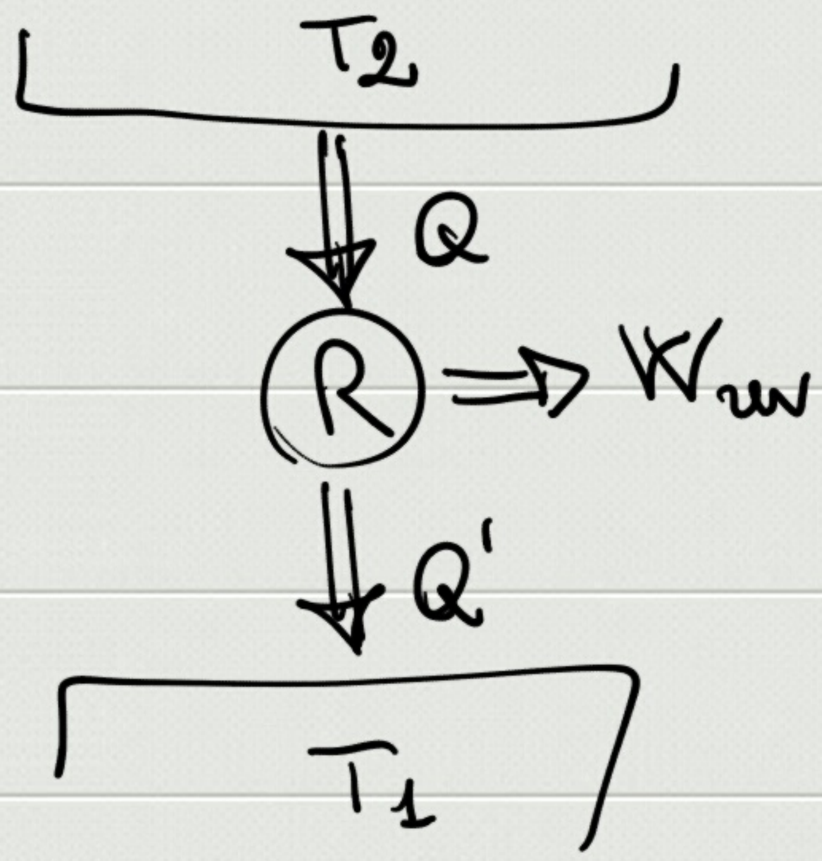
$$W_{rev} - W_{irrev} = nRT \ln \frac{V_{fin}}{V_{in}} = T \Delta S_U$$

0



$$W_{irrev} = 0$$

$$\Delta S_U = \frac{-Q}{T_2} + \frac{Q}{T_1}$$

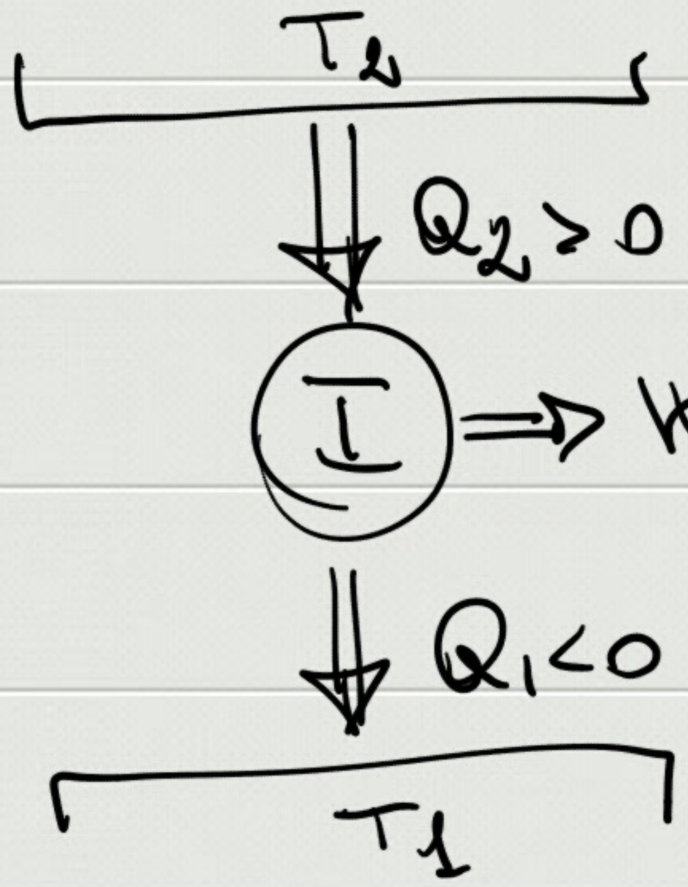


$$W_{rev} = \eta_R Q = Q\left(1 - \frac{T_1}{T_2}\right)$$

$$W_{rev} - W_{irrev} = Q\left(1 - \frac{T_1}{T_2}\right) = T_1\left(\frac{Q}{T_1} - \frac{Q}{T_2}\right) =$$

$$W_{irrev} = 0$$

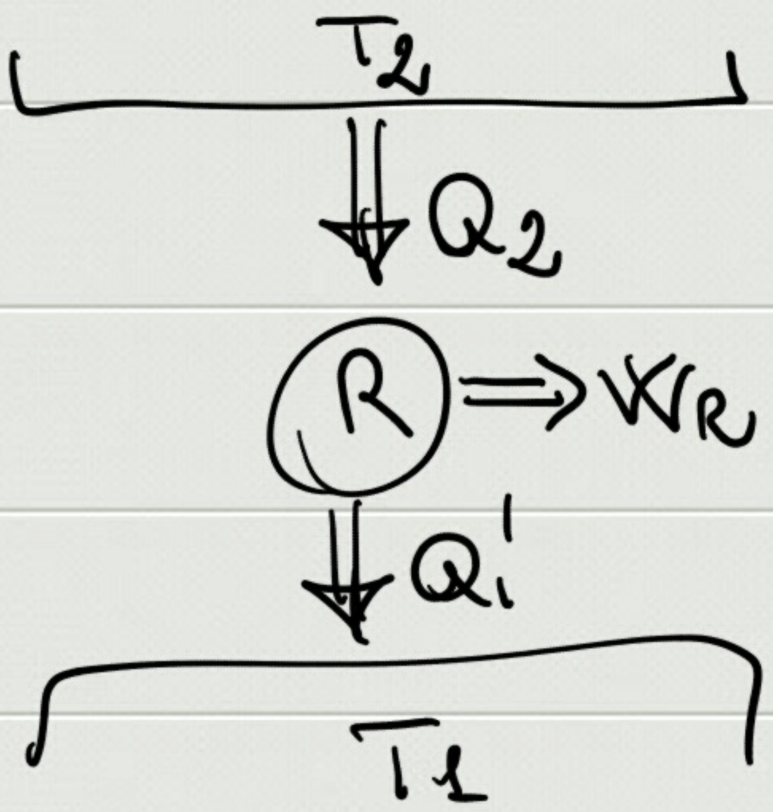
$$= T_1 \Delta S_U$$



$$W_I = Q_1 + Q_2$$

$$\Delta S_U = \Delta S_{\cancel{\text{mecc}}} + \Delta S_{amb} =$$

$$= \frac{-Q_2}{T_2} + \frac{-Q_1}{T_1}$$



$$W_R = \eta_R Q_2 = Q_2 \left(1 - \frac{T_1}{T_2}\right)$$

$$W_R - W_I = Q_2 \left(\cancel{1} - \frac{T_1}{T_2}\right) - (Q_1 + \cancel{Q_2}) =$$

$$= T_1 \left(\frac{-Q_2}{T_2} + \frac{-Q_1}{T_1}\right) = T_1 \Delta S_U$$

$$\boxed{E_{IN} = T_{min} \Delta S_U}$$