

الباب السابع

القانون الثاني للديناميكا الحرارية

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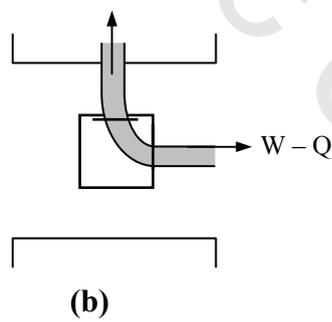
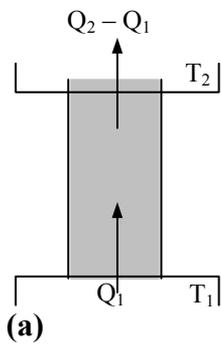
flywheel

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obbeikandi.com

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(a)

(

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(b)

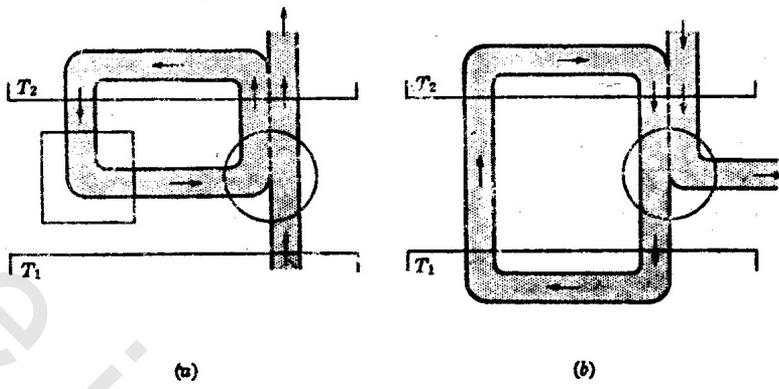
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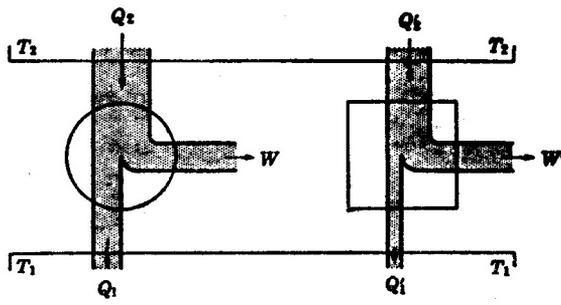
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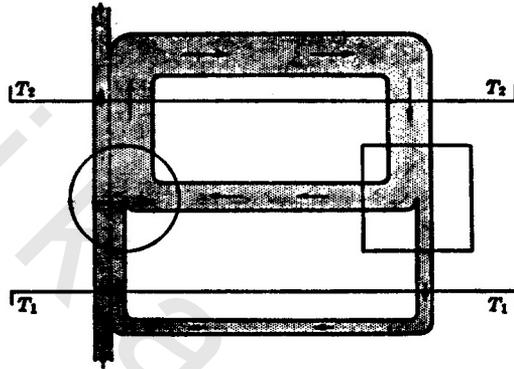


(a)

$T_1 T_2$



(a)



(b)

$$W = Q_2 \left(\frac{T_2}{T_1} - 1 \right) = \left(\frac{Q_2}{Q_1} - 1 \right) Q_1$$

$$W = Q_2 - Q_1$$

(b)

()

$$Q_2/Q_1 = T_2/T_1$$

Q_2

Q_1

Q_2/Q_1

$$T_2/T_1$$

$$T_2/T_1$$
$$T_2/T_1$$

$$Q_2/Q_1 = T_2/T_1$$

180°

T, T_i, T_s

Q_i, Q_s

Q

Q_s

T

$$Q_s/Q_i = T_s/T_i$$

$$Q_s/Q = T_s/T$$

$$T_s - T_i = 100$$

$Q \quad Q_i \quad Q_s$
 $T \quad T_i \quad T_s$

T_1

T_2

Q_1

Q_2

$$Q_1/T_1 = Q_2/T_2$$

$$W = Q_2 - Q_1 :$$

W

:

$$E = \frac{Q_1}{W} = \frac{Q_1}{Q_2 - Q_1} = \frac{T_1}{T_2 - T_1}$$

:

:

$$T_2 \cdot T_1 \quad Q_2 \quad T_2$$

:

W

$$W = Q_2 - Q_1$$

:

$$Q_1 = Q_2 (T_1/T_2)$$

$$W = Q_2 - Q_2(T_1/T_2)$$

فإن:

$$T_1 = T_2 = [1 - (w/Q_2)]$$

:

T₁

W

$$w < Q_2$$

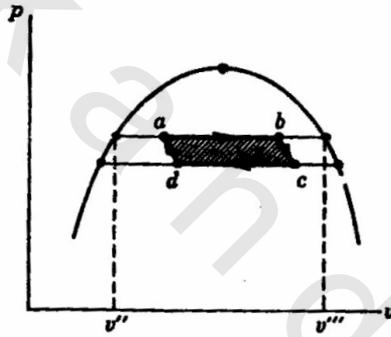
$$[1 - (w/Q_2)]$$

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: (a)



(a)

(c)

(c)

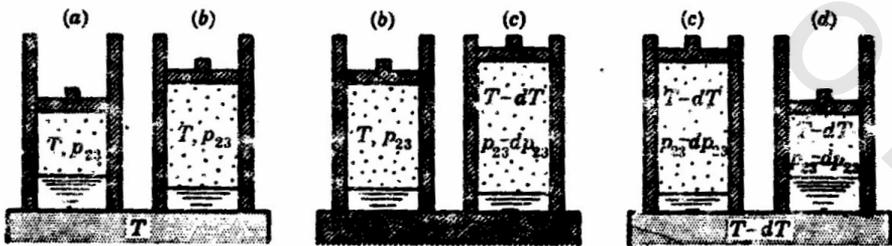
a

(a)

(a)

p_{23}

T



(c)

$$m \cdot \frac{v''' - v''}{T} \quad (a) \quad b \quad (c)$$

$$m \cdot \frac{mv'''}{m(v''' - v'')} \quad mv'' \quad Q$$

$$p_{23} \quad T$$

$$P_{23} - dP_{23}$$

$$T - dT$$

$$(a) \quad c$$

$$T - dT$$

$$(a)$$

$$d$$

$$a$$

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

$$\frac{d'W}{Q_2} = \frac{dT}{T}$$

$$Q = ml_{23}$$

$$d'W$$

$$\partial'w = m(v''' - v'') \partial'pn \quad (a)$$

$$\frac{d'W}{Q_2} = \frac{m(v''' - v'') dp_{23}}{m l_{23}}$$

$$\frac{dp_{23}}{dT} = \frac{l_{23}}{(T(v''' - v''))}$$

$$\frac{dp_{23}}{dT} = \frac{l_{23}}{(T(v''' - v'))}$$

$$\frac{dp_{12}}{dT} = \frac{l_{23}}{(T(v''' - v''))}$$

$$(v''' - v') \quad (v''' - v'')$$

$$p - v - T$$

$$(v'' - v')$$

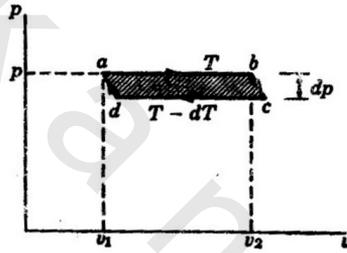
$$p - T$$

$$\frac{dp}{dT} = \frac{l}{T \frac{RT}{p}} \therefore \frac{dp}{p} = \frac{l}{R} \frac{dT}{T^2}$$

$$\ln p = -\frac{l}{RT} + \ln C$$

$$p = Ce^{-\frac{l}{RT}}$$

$1/3$



bc T ab
 T - dT
 da cd
 p = 1/2e
 ab W

$$W = p(V_2 - V_1) = \frac{1}{2}e(V_2 - V_1)$$

$$U_2 - U_1 = e(V_2 - V_1)$$

Q

$$Q = (U_2 - U_1) + W = \frac{1}{2}e(V_2 - V_1)$$

:

$$d'w$$

$$d'W = dp(V_2 - V_1)$$

:

$$p = \frac{1}{2}e$$

$$dp = \frac{1}{2}de$$

$$dw = \frac{1}{2}de (V_2 - V_1)$$

:

$$: \quad dT/T \quad d'w$$

$$\frac{\frac{1}{2}de(V_2 - V_1)}{\frac{1}{2}e(V_2 - V_1)} = \frac{dT}{T}$$

$$\frac{de}{e} = 4 \frac{dT}{T}$$

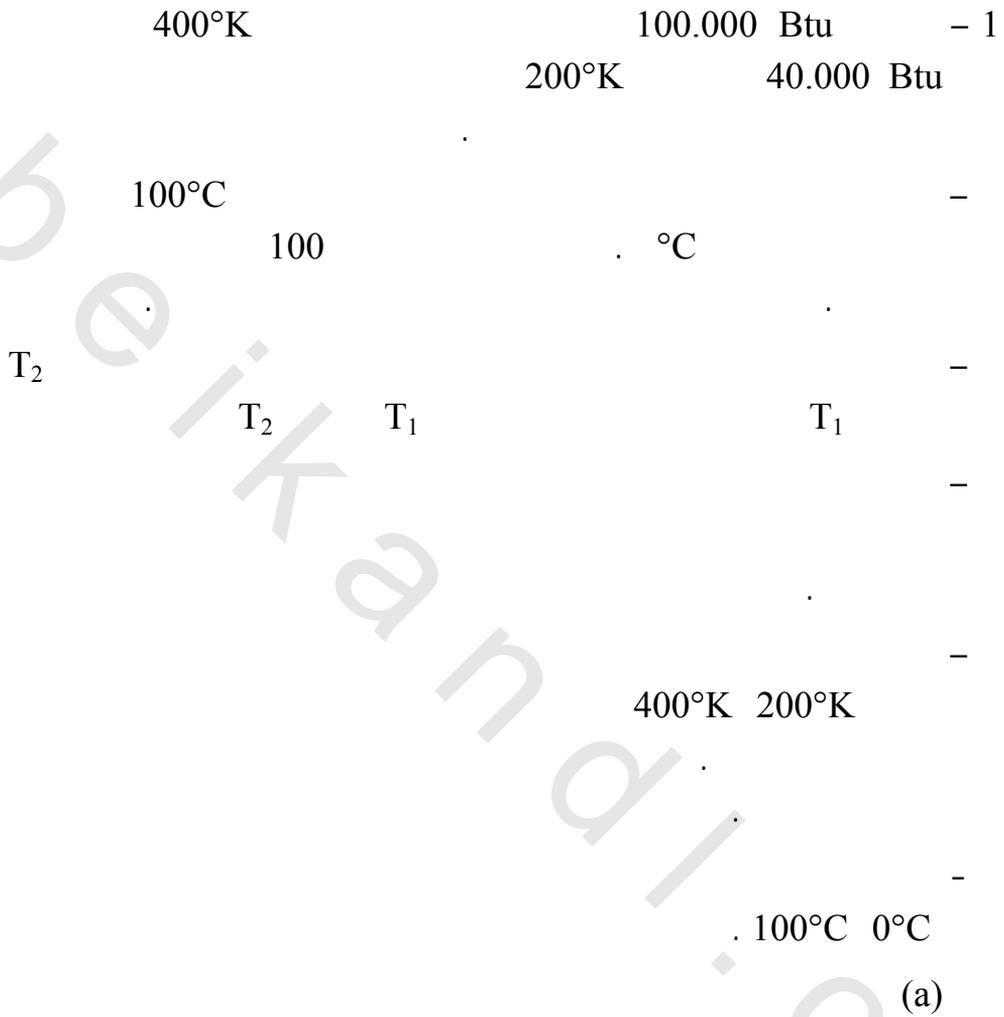
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$$\ln = 4 \ln t +$$

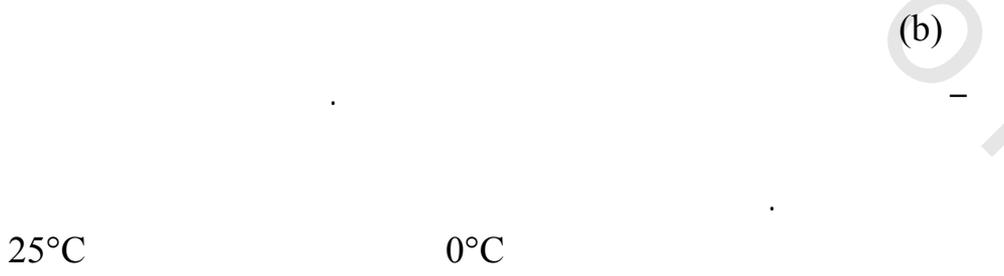
$$e = \quad \times T^4$$

* * *

الأجهزة



(a)



(b)

/

0°C

—

25°C

) ×

(50 lb

0°C 25°C

* * *