The 3 fractions again represent mercury columns, which are named x, h and h_2, and are the pressure difference of the blastpipe and the housing, the pressure of the blast pipe to the outside pressure and the pressure difference in the suction pipe and the outside pressure.

Substitution will give: $$(1+\kappa)\frac{w_2^2}{2g} = \frac{\gamma_0}{\gamma_2}(x - h + h_2) \qquad \text{(A2.7)}$$

If the value of x were known, which is dependent of the pressure p_x within the housing, it would be possible to calculate the velocities w and w_2 in equations (A2.3) and (A2.7). Determination of x requires another equation. Within chimney B the pressure is p_x, outside p_0. The work that is won because of the constancy of the pressure is: $\frac{p_x - p_0}{\gamma_1}$. In the beginning the unit of weight of fluid already contains the work $\frac{w^2}{2g}$. According to Carnot the sudden transition of the velocity w into the velocity w_1 in the chimney introduces a 'shock loss' in the form $\frac{(w-w_1)^2}{2g}$. In this w is the original value of the velocity of the fluid and w_1 its value after the sudden velocity drop, g is the value of the gravity acceleration. As such the weight Q of steam flowing from orifice A into chimney B contains the work:

$$Q\{\frac{p_x - p_0}{\gamma_1} + \frac{w^2}{2g} - \frac{(w-w_1)^2}{2g}\} \qquad \text{(A2.8)}$$

At the same time the amount Q_2 of air sucked in at velocity w_0 will contain the work:

$$Q_2\{\frac{p_x - p_0}{\gamma_1} + \frac{w_0^2}{2g} - \frac{(w_0-w_1)^2}{2g}\} \qquad \text{(A2.9)}$$

Addition of the two gives the total amount of work per unit of time in the mixture; for this, however, the expression $(Q+Q_2)\frac{w_1^2}{2g}$ is also valid, so that:

$$(Q+Q_2)\frac{w_1^2}{2g} = Q[\frac{p_x - p_0}{\gamma_1} + \frac{w^2}{2g} - \frac{(w-w_1)^2}{2g}] + Q_2[\frac{p_x - p_0}{\gamma_1} + \frac{w_0^2}{2g} - \frac{(w_0-w_1)^2}{2g}] \qquad \text{(A2.10)}$$

The velocity w_0 is regarded to be very low and can be set to zero, as the sucked fluid loses its velocity completely. The equation can then be reduced to:

$$\frac{p_o - p_x}{\gamma_1} = 2\left\{\frac{Q}{Q+Q_2}\cdot\frac{ww_1}{2g} - \frac{w_1^2}{2g}\right\} \qquad \text{(A2.11)}$$

{In the theoretical treatment of chapter 6 it is shown that this equation is a special form of a more universal one.}

The amount of sucking fluid entering is: $Q = Fw\gamma_1$.

The amount of sucked fluid is determined in the same way: $Q_2 = F_2 w_2 \gamma_1$ or, better:

$Q_2 = \varphi\, F_2 w_2 \gamma_1$ taking in account the contraction coefficient φ. If the fluid enters through pipes, then $\varphi = 1$.

Both fluid amounts $Q + Q_2$ flow through chimney B with velocity w_1 so that:

$Q + Q_2 = F_1 w_1 \gamma_1$