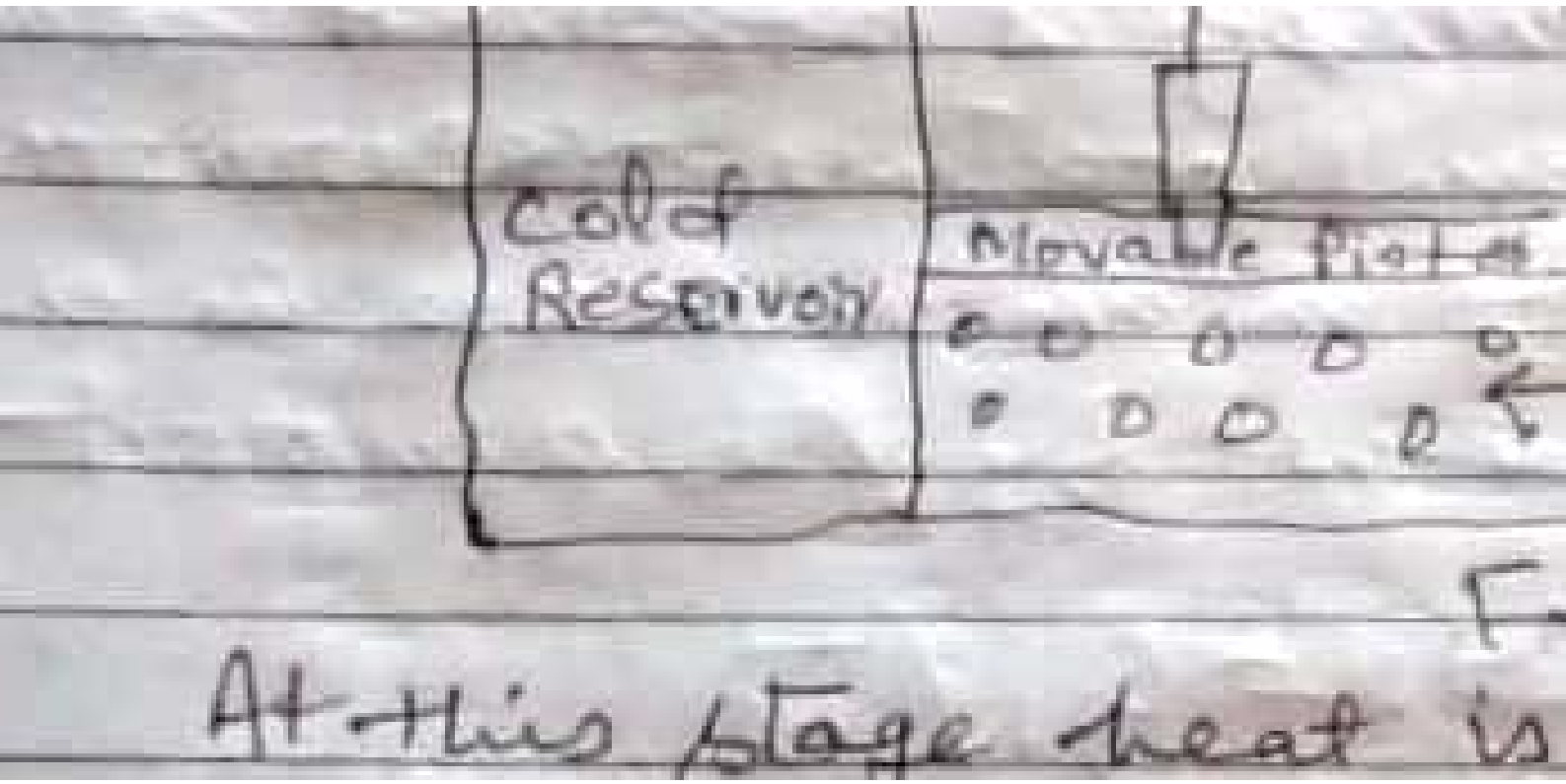
The carnot cycle is a theoretical ideal thermodynamic cycle proposed by French physicist Sadi Carnot in 1824 and expanded of others by 1830s and 1840s. It provides an upper limit on the efficiency that any classical thermodynamic engine can achieve during the conversion of heat into work or conversely the efficiency of a refrigeration system in

work on its surroundings. For eg. by moving a piston thereby acting as a heat engine although such a perfect engine is only a theoretical construct and cannot be built in practice. However a microscopic Carnot heat engine has been designed and run.

Essentially there are two heat reservoirs forming part of the heat engine at temperature T_h and T_c (hot and cold respectively). They have such large thermal capacity and their temperature are practically unaffected by a single cycle. Since the cycle is



At this stage heat is

~~1 to 2 is~~, the gas is allowed to expand, doing work on the surroundings by pushing up the piston. Although the pressure drops, the temperature of the gas does not change during the process because it is in thermal contact with the hot reservoir at T_h and thus the expansion is isothermal. Heat energy is absorbed from the high temperature reservoir resulting in an increase in entropy of the gas by the amount

$$\Delta S_1 = Q_1 / T_h$$