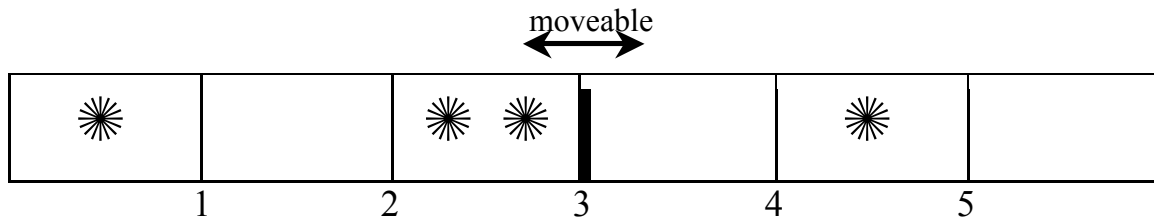


In this problem we consider the equilibration of volume in the system pictured below. This chamber contains four **indistinguishable** particles and is composed of six discrete bins, each of which may hold many particles. There is a moveable barrier dividing the chamber (shown at position three below) through which the particles can not pass. The barrier may be found at positions $m=1, 2, 3, 4,$ or 5 , each of which corresponds to an observable macrostate of the system.



1. [7 points] For each macrostate calculate the number of microstates:
2. [3 points] What is the dimensionless entropy of the most likely macrostate?
2. [3 points] What is the most likely position of the barrier?
3. [3 points] What is the probability of finding the barrier at its most likely position?
4. [4 points] What is the average barrier position?