Gear - 1	$N_1 = 65$
Gear - 2	$N_2 = 12$
Gear - 3	$N_3 = 60$
Gear - 4	$N_4 = 8$
Gear - 5	$N_5 = 64$
Gear - 6	$N_6 = 8$
Gear - 7	$N_7 = 56$
Gear - 8	$N_8 = 7$
Gear - 9	$N_9 = 15$

LAB 4, PROBLEM # 7: ALARM CLOCK GEAR TRAIN

A. First goal is to find ω_9 / ω_1. You MUST follow the gear path; gear 1 to 2 to 3...

When gears are on separate shafts (I.e between gears 1 and 2):

$$\omega_a / \omega_b = (N_b / N_a) \qquad N_i = \text{\# of teeth on gear } i$$

When gears are on the same shaft (I.e. between gears 2 and 3):

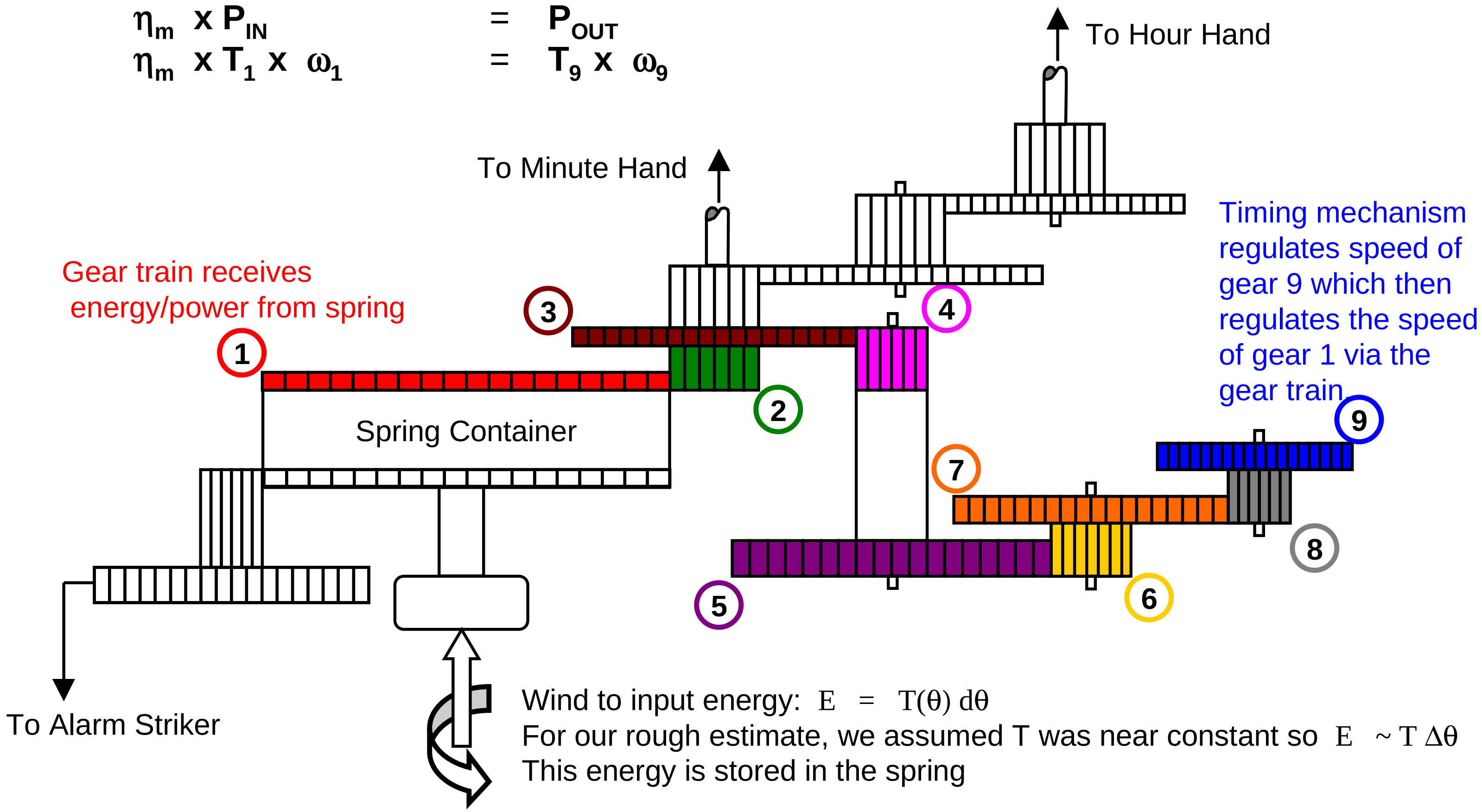
$$\omega_a = \omega_b$$

B. Second goal is to find the torque ratio (T_9 / T_1) using power flow.

You can relate the power between gears 1 and 9 directly! You do not have to go through each gear as you did above.

$$\eta_m \times P_{IN} = P_{OUT}$$

$$\eta_m \times T_1 \times \omega_1 = T_9 \times \omega_9$$



Wind to input energy: $E = T(\theta)\, d\theta$

For our rough estimate, we assumed T was near constant so $E \sim T\, \Delta\theta$

This energy is stored in the spring