$$I = \sum_i q_i^2, \ K = \sum_i \dot{q}_i^2, \ V_\alpha = \frac{1}{\alpha} \sum_{i<j} r_{ij}^\alpha,$$

$$H = \frac{1}{2} K + V_\alpha.$$

$$\Rightarrow \frac{d^2 I}{dt^2} = 2K - 2\alpha V_\alpha = 4E - 2(2+\alpha)V_\alpha$$

For $\alpha = -2$,

$$\frac{d^2 I}{dt^2} = 4E \Rightarrow I = 2Et^2 + c_1 t + c_2.$$

$$\therefore I = \text{const.}, \text{ if } E = 0, \frac{dI}{dt}(0) = c_1 = 0.$$