

- (1) Determine the deflection function (i.e., $w(x)$) of a loaded beam, shown in Fig. 1, using
- (a) the conjugate beam method, (15%)
 - (b) the method of virtual work (i.e., the method of unit load). (15%)

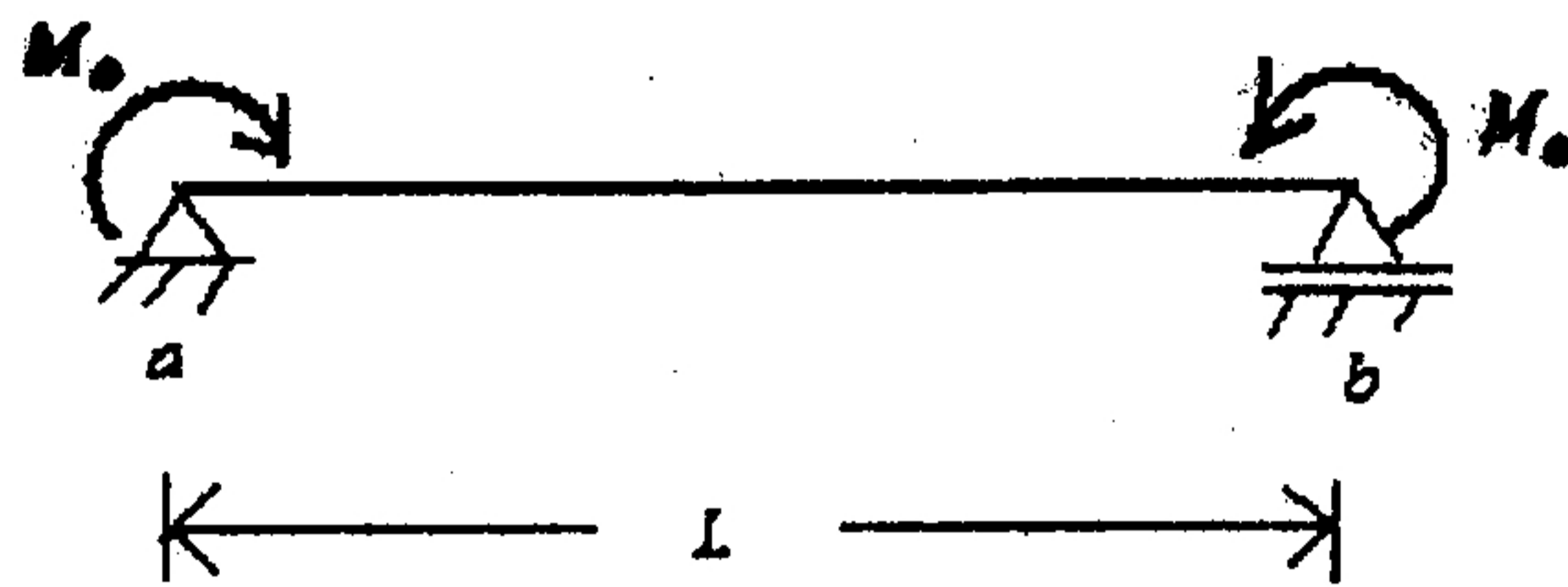


Figure 1

- (2) Consider a statically determinate frame as shown in Fig. 2. Determine and draw the influence lines for
- (a) the internal shear force at point C, (10%)
 - (b) the fixed moment at point E, (10%)
- using the force and moment equilibrium equations for each free body diagram.

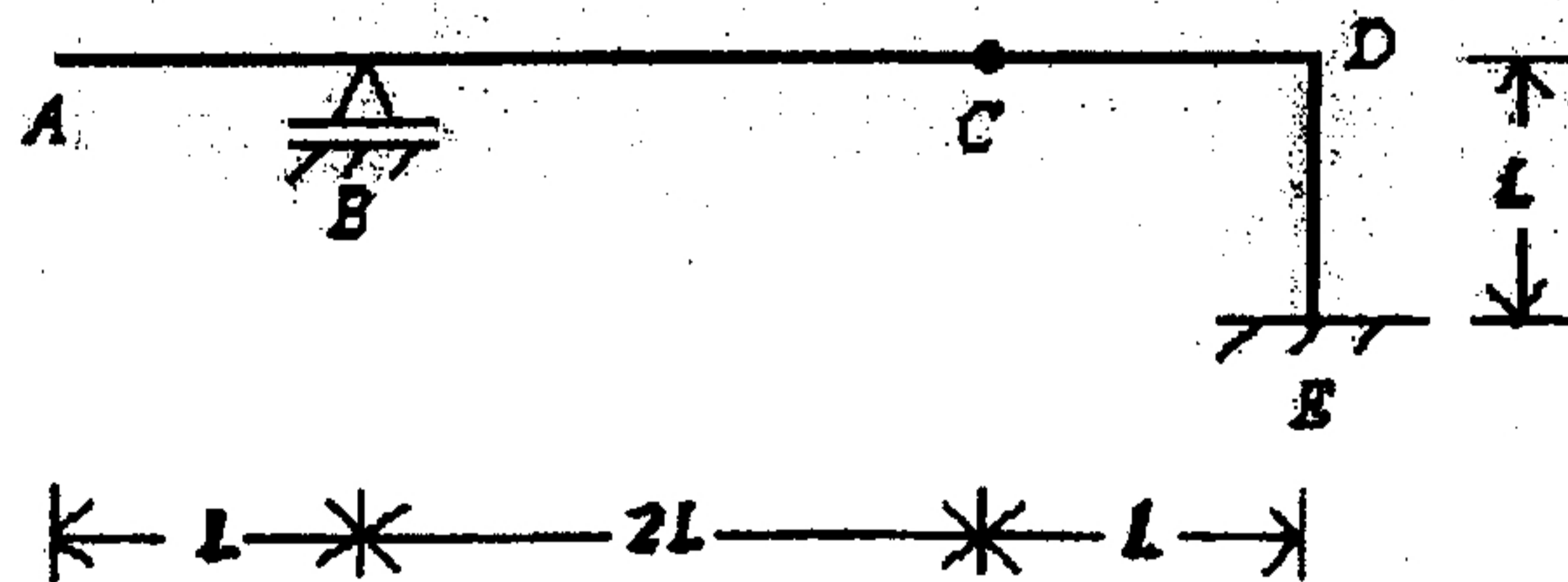


Figure 2

(背面仍有題目,請繼續作答)

(3) Consider a loaded beam as shown in Fig. 3 where the flexural rigidity of the beam is EI and the spring constant is k , (Let $k_s = 24EI/L^3$). Determine the deflection and rotation at point B, the spring force and all the end moments using

- (a) the slope-deflection method, (15%)
- (b) the moment distribution method. (15%)

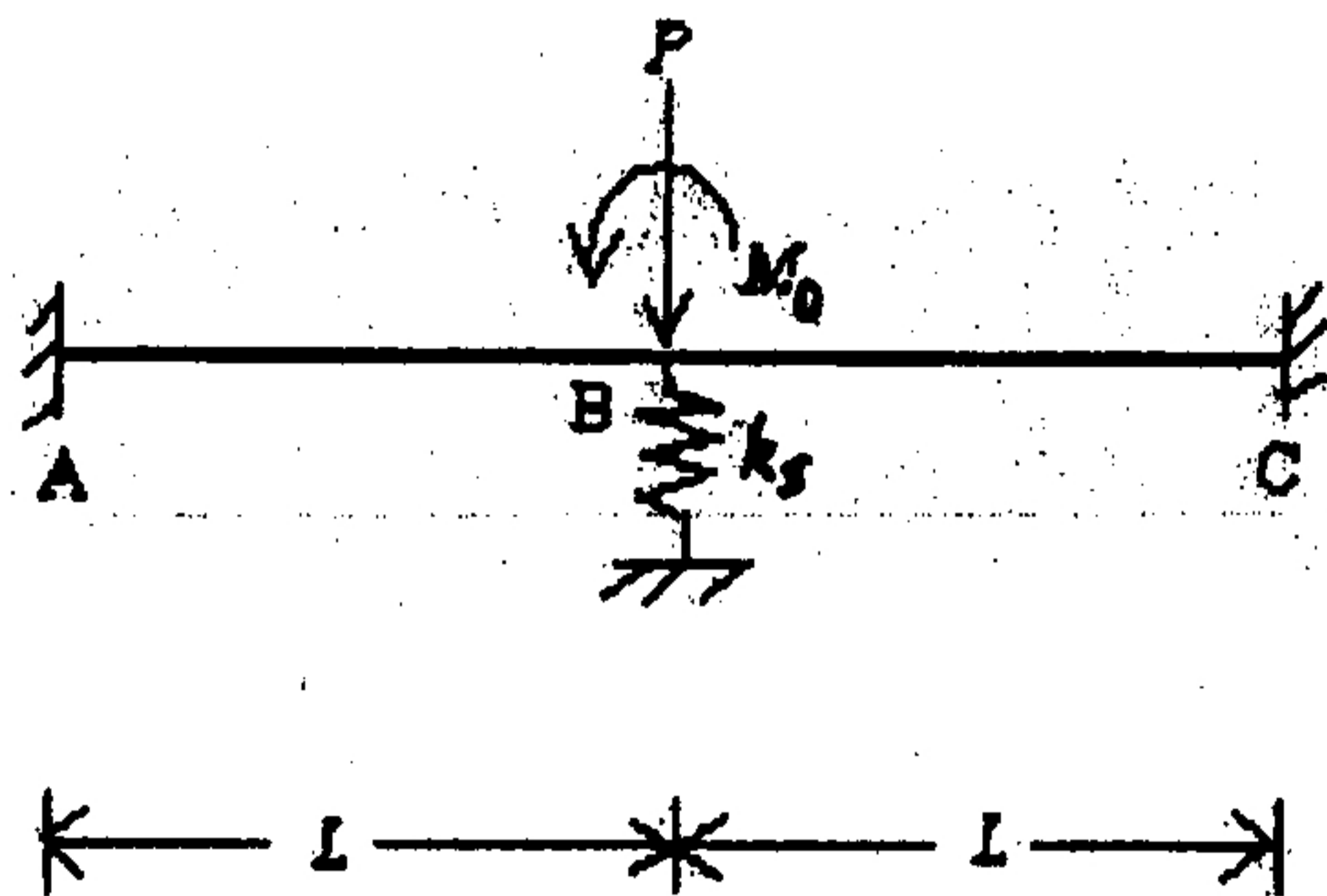


Figure 3

(4) Consider the same loaded beam in problem 3 (see Fig. 4). Determine the deflection and rotation at point B using the matrix displacement method. (20%)

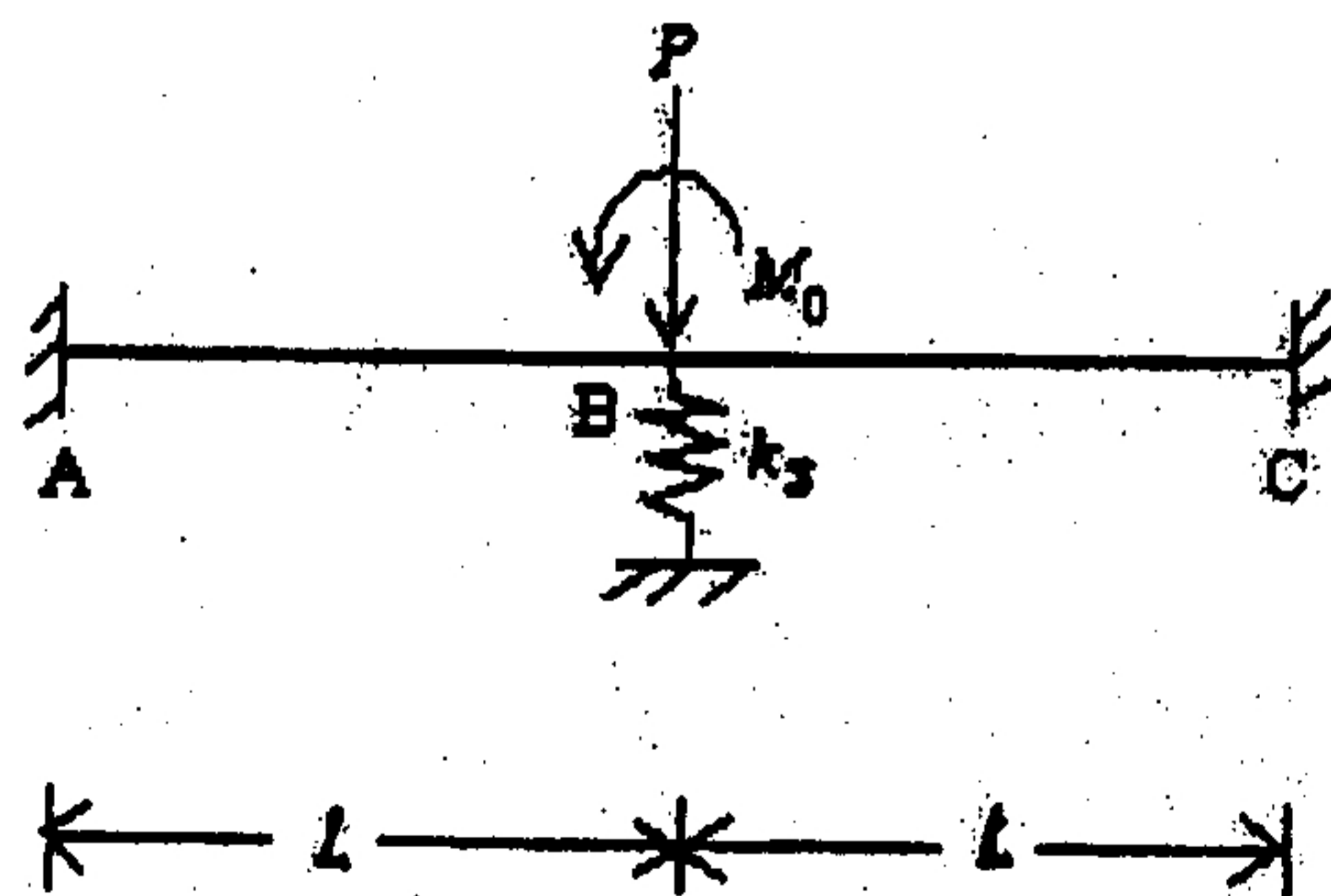


Figure 4