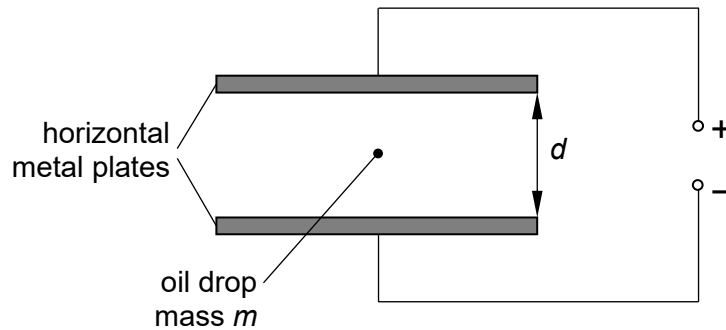


- 22 A negatively charged oil drop of mass  $m$  is between two horizontal parallel metal plates at a distance  $d$  apart.



When the potential difference (p.d.) between the plates is  $V_1$ , the oil drop rises at a constant speed. When the p.d. is decreased to  $V_2$ , the oil drop falls at the same constant speed.

Air resistance acts on the oil drop when it is moving. The upthrust on the drop is negligible.

The acceleration of free fall is  $g$ .

What is the charge on the oil drop?

- A**  $\frac{mdg}{V_1 - V_2}$       **B**  $\frac{mdg}{V_1 + V_2}$       **C**  $\frac{2mdg}{V_1 - V_2}$       **D**  $\frac{2mdg}{V_1 + V_2}$