

- 3 An aluminium sheet is suspended from an oscillator by means of a spring, as illustrated in Fig. 3.1.

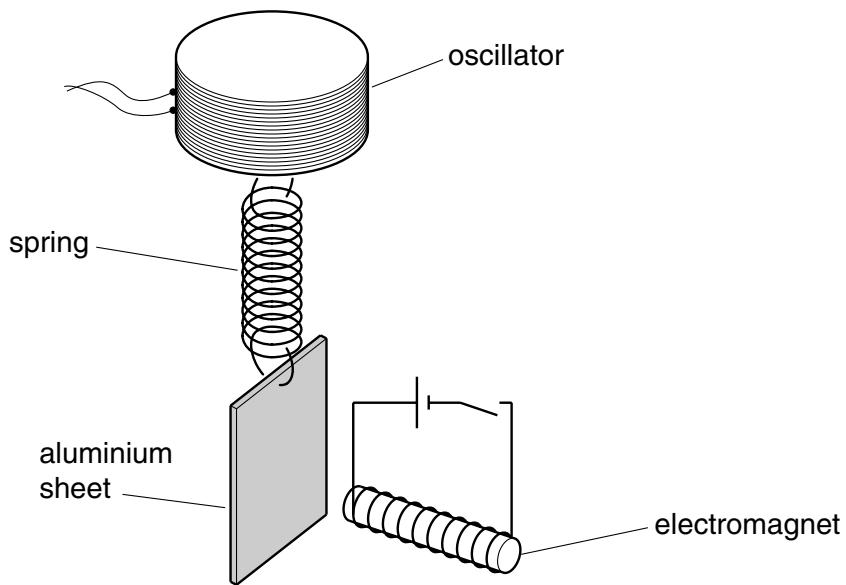


Fig. 3.1

An electromagnet is placed a short distance from the centre of the aluminium sheet.

The electromagnet is switched off and the frequency f of oscillation of the oscillator is gradually increased from a low value. The variation with frequency f of the amplitude a of vibration of the sheet is shown in Fig. 3.2.

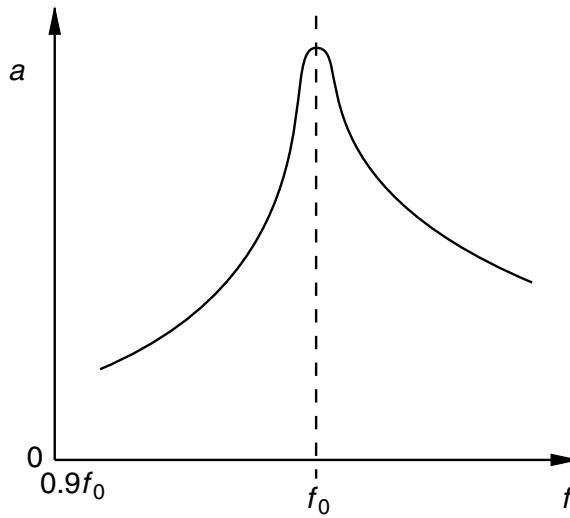


Fig. 3.2

A peak on the graph appears at frequency f_0 .

- (a) Explain why there is a peak at frequency f_0 .

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- (b) The electromagnet is now switched on and the frequency of the oscillator is again gradually increased from a low value. On Fig. 3.2, draw a line to show the variation with frequency f of the amplitude a of vibration of the sheet. [3]
- (c) The frequency of the oscillator is now maintained at a constant value. The amplitude of vibration is found to decrease when the current in the electromagnet is switched on.

Use the laws of electromagnetic induction to explain this observation.

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