Measurement and Instrumentation

Course Code: EEE 2211

AC Bridges

Md. Mahmudul Hasan
Lecturer, Dept. of Electrical & Electronic Engineering
Rajshahi University of Engineering & Technology
E-mail: *mh.mahmud.ruet@gmail.com*
mahmud@eee.ruet.ac.bd
Cell: 01837-540698

Syllabus

Introduction : Methods of measurement. Statistical method applied to field of measurement and error analysis and calibration.

Resistance, Inductance and Capacitance measurements: Different methods of measuring high, medium and low resistances. Methods of measuring self and mutual inductance and capacitance measurement. A.C. and DC bridge methods, Measurement of insulation and earth resistances. Localization of cable fault.

Magnetic measurement: Flux meter, Flux and Flux density measurement. Determination of iron losses and their separation.

Measuring instruments : Classification of measuring instruments. Ammeter, Voltmeter, wattmeter, AVO meter, Energy meter, Ampere-hour meter and Maximum demand meter for measuring AC and DC quantities. Speed, frequency and phase difference measurements. Illumination measurement.

Electronic measuring instruments: Digital instruments, VTVM, Q-meter and CRO.

Instrumentation : Extension of instrument range. Use of C.T. and P.T and calculation of their burden, Instrumentation of substation.

Measurement of non-electrical quantities: Transducer. Measurement of temperature, pressure, displacement, velocity, acceleration. Strain gauge and their applications.

Basic AC Bridge

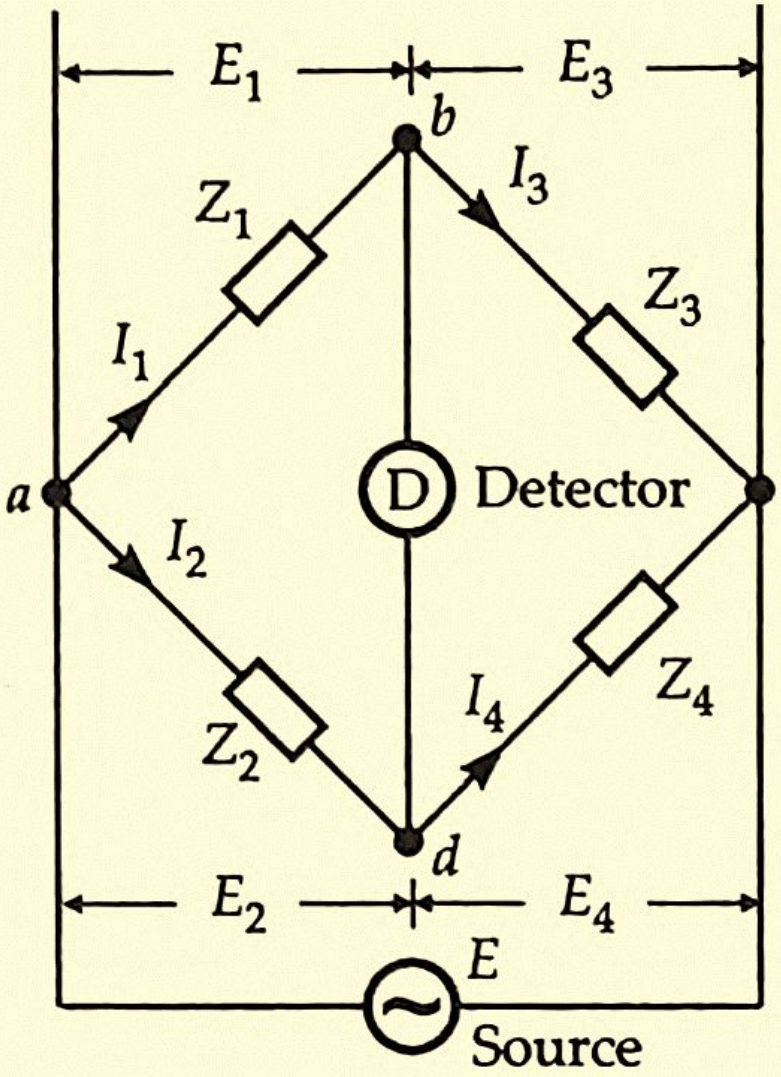
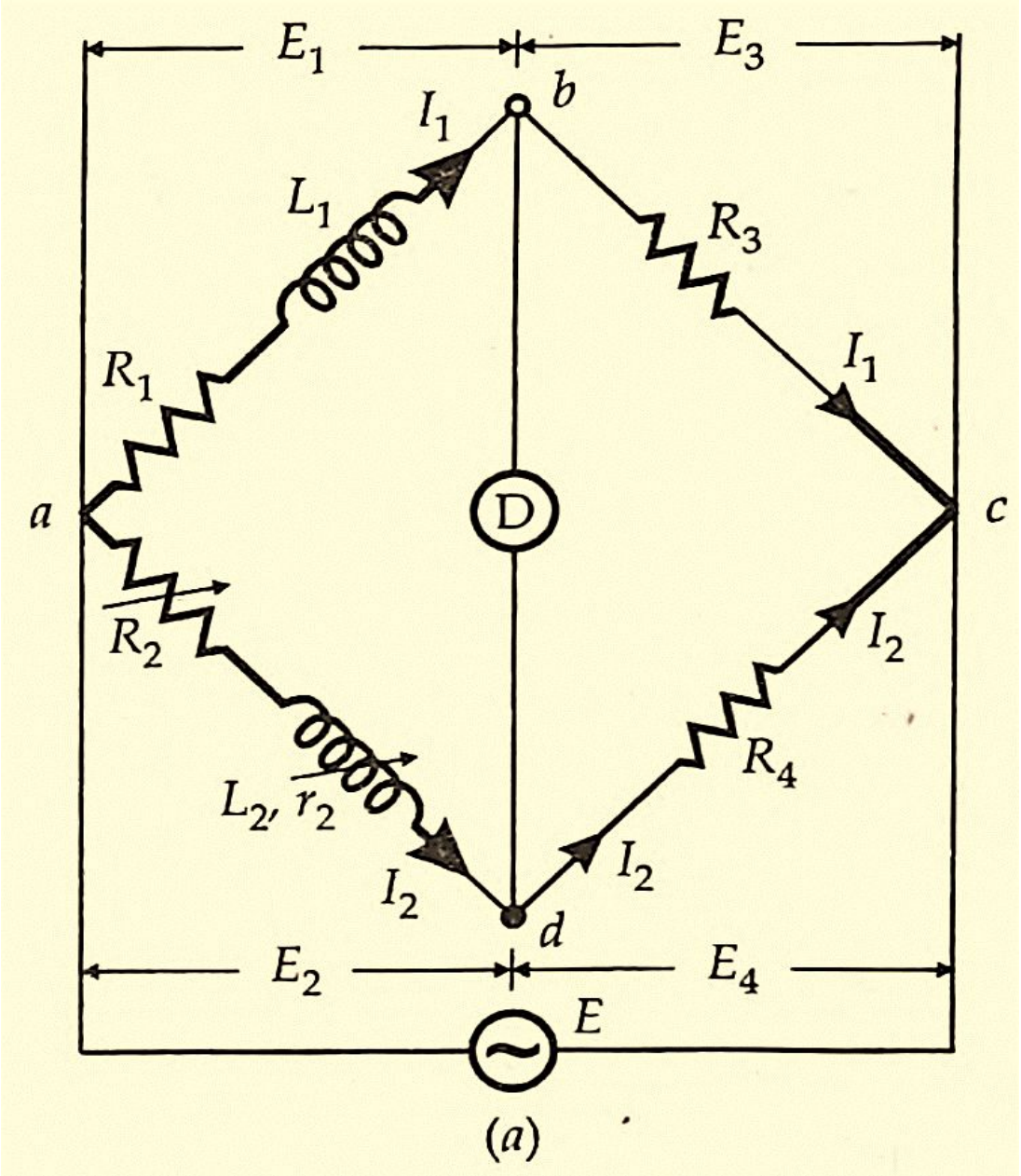


Fig. 16.1 Basic a.c. bridge network.

Maxwell's Inductance Bridge



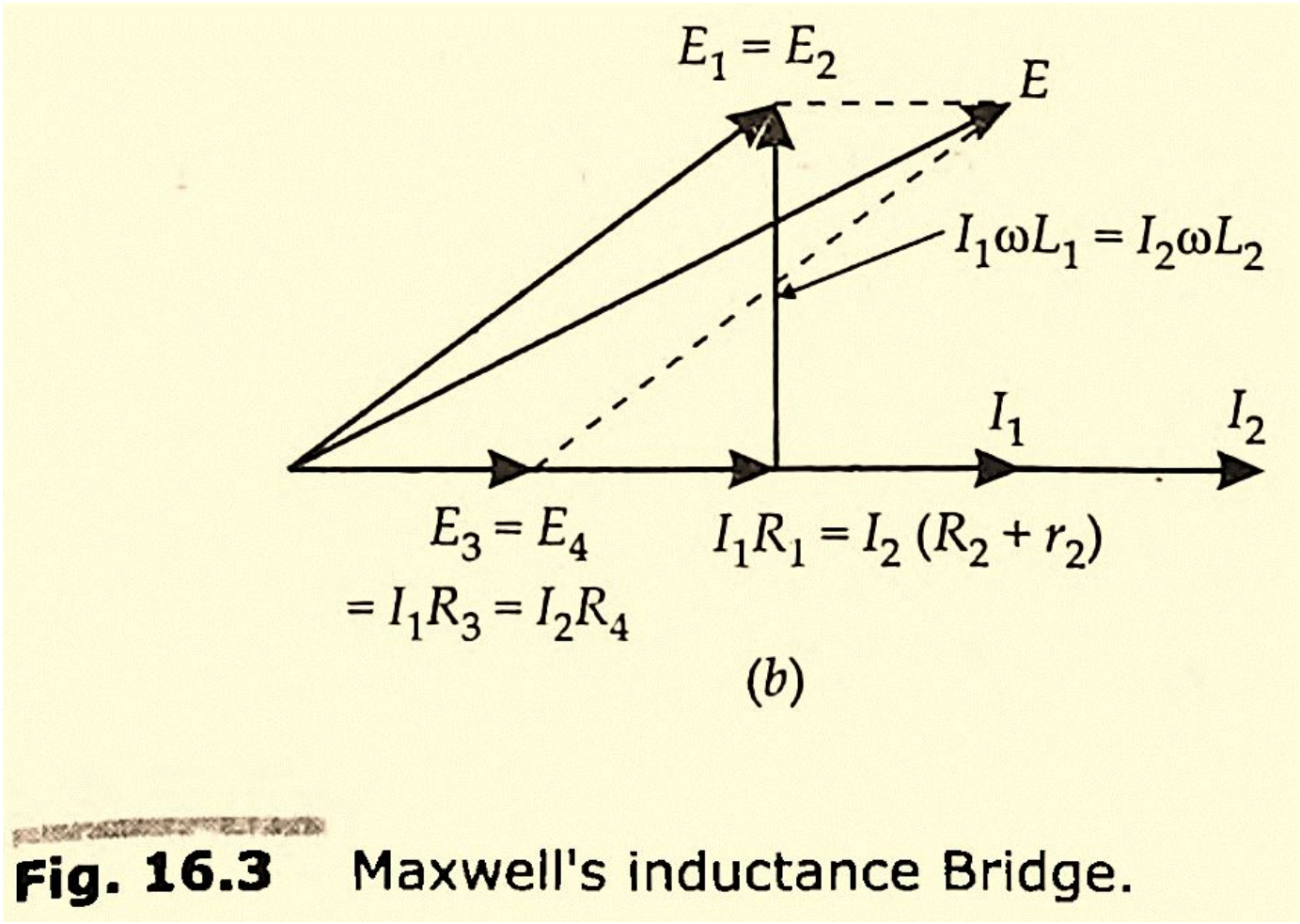
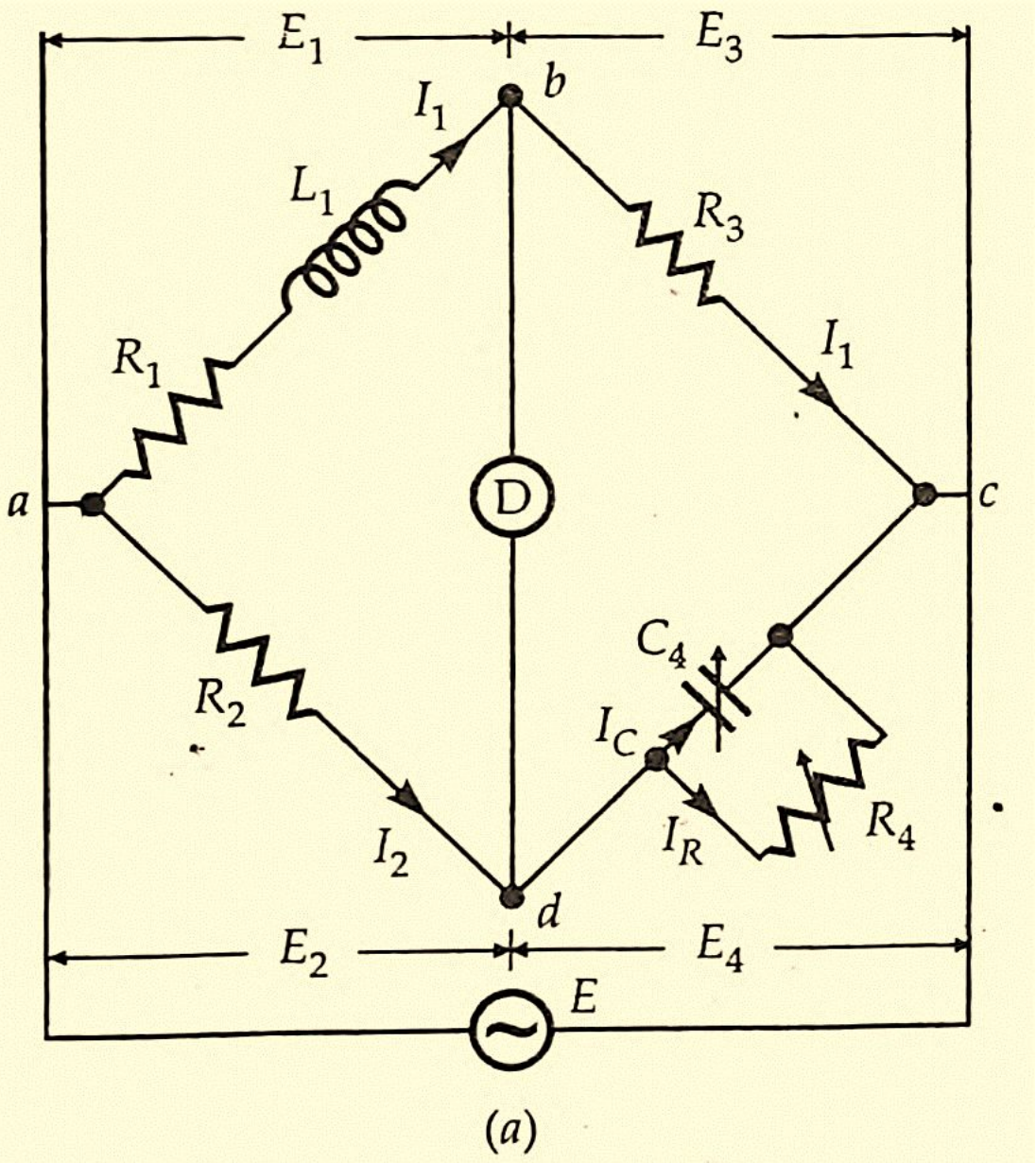


Fig. 16.3 Maxwell's inductance Bridge.

Maxwell's Inductance Capacitance Bridge



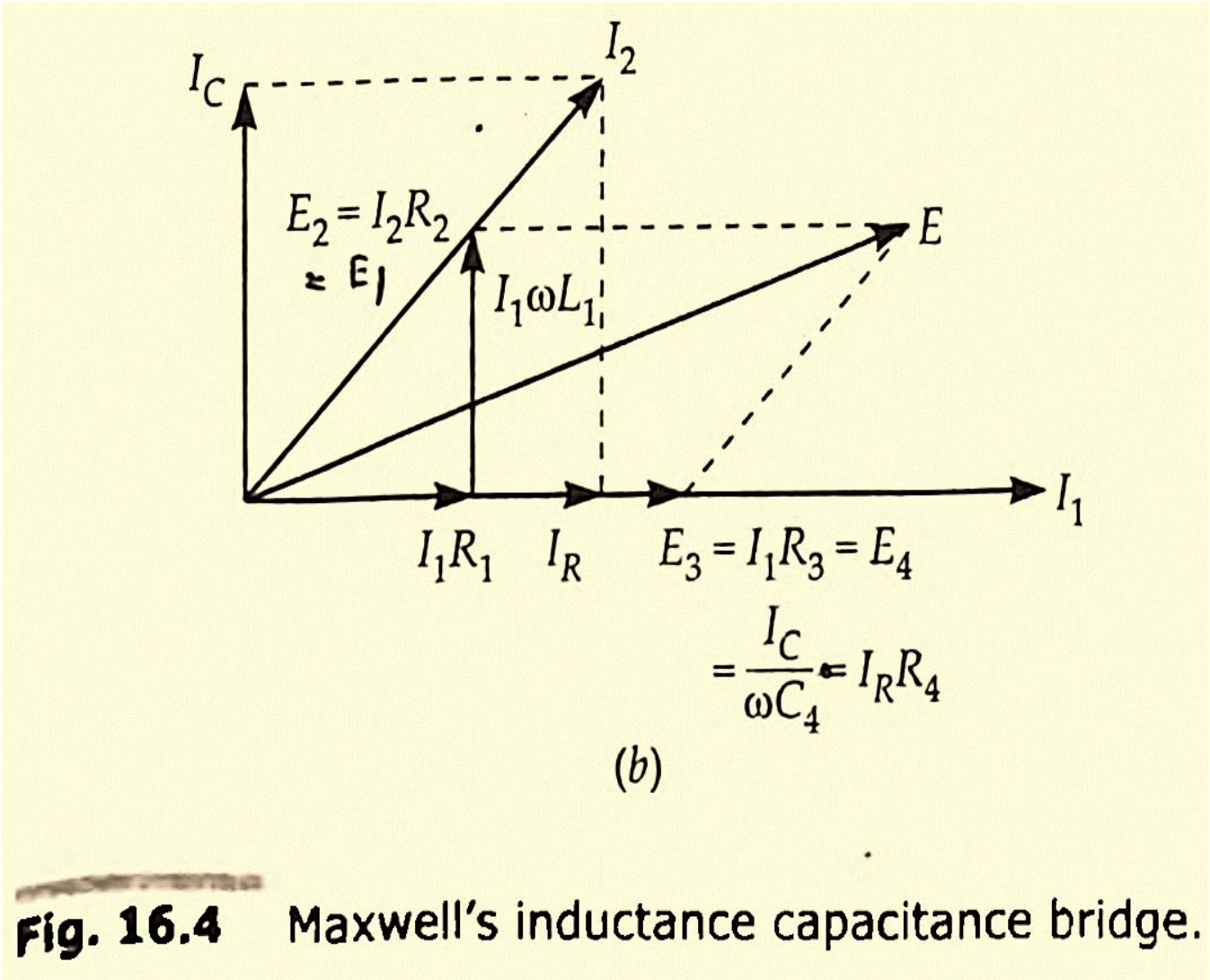
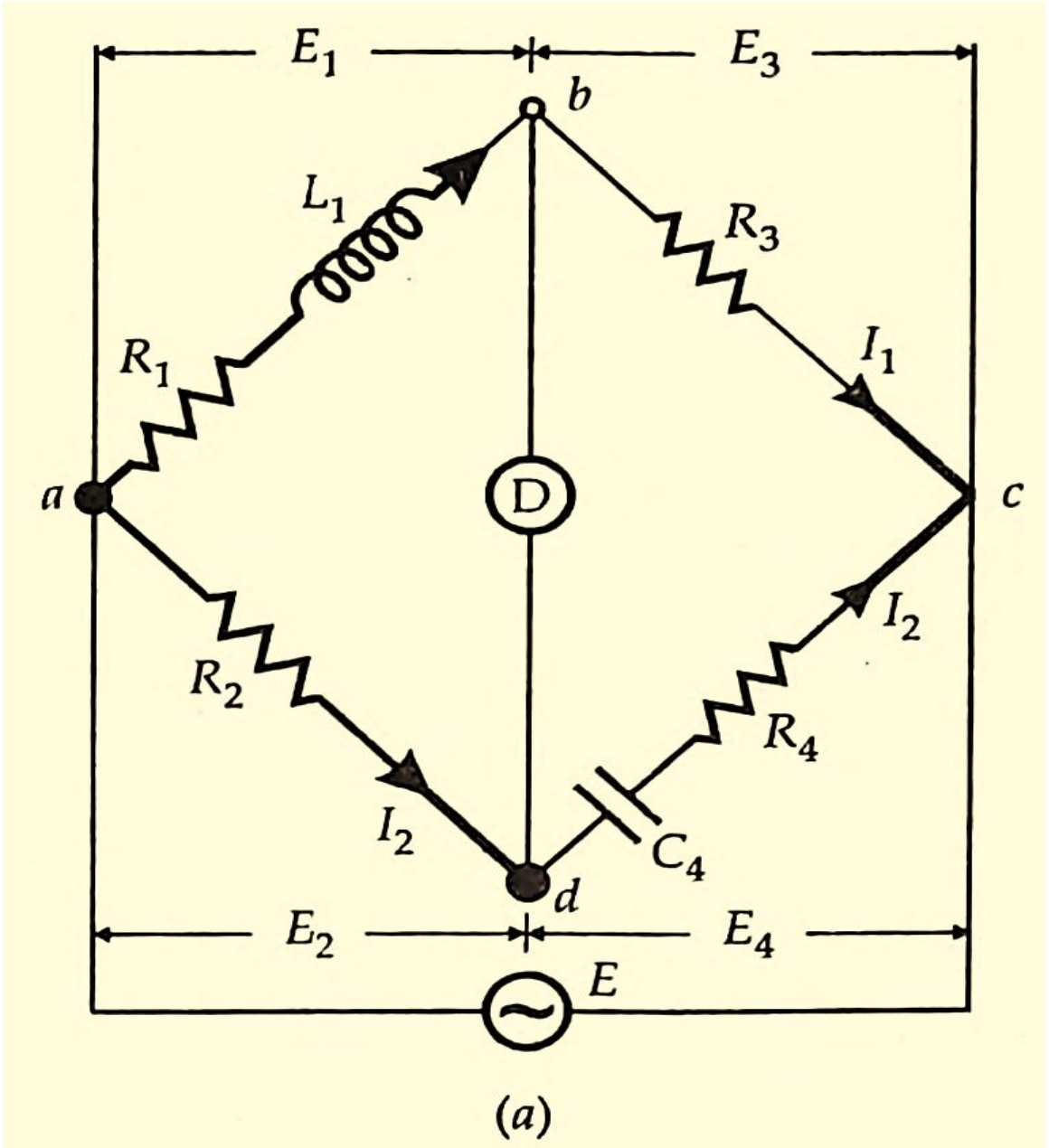


Fig. 16.4 Maxwell's inductance capacitance bridge.

Hay's Bridge



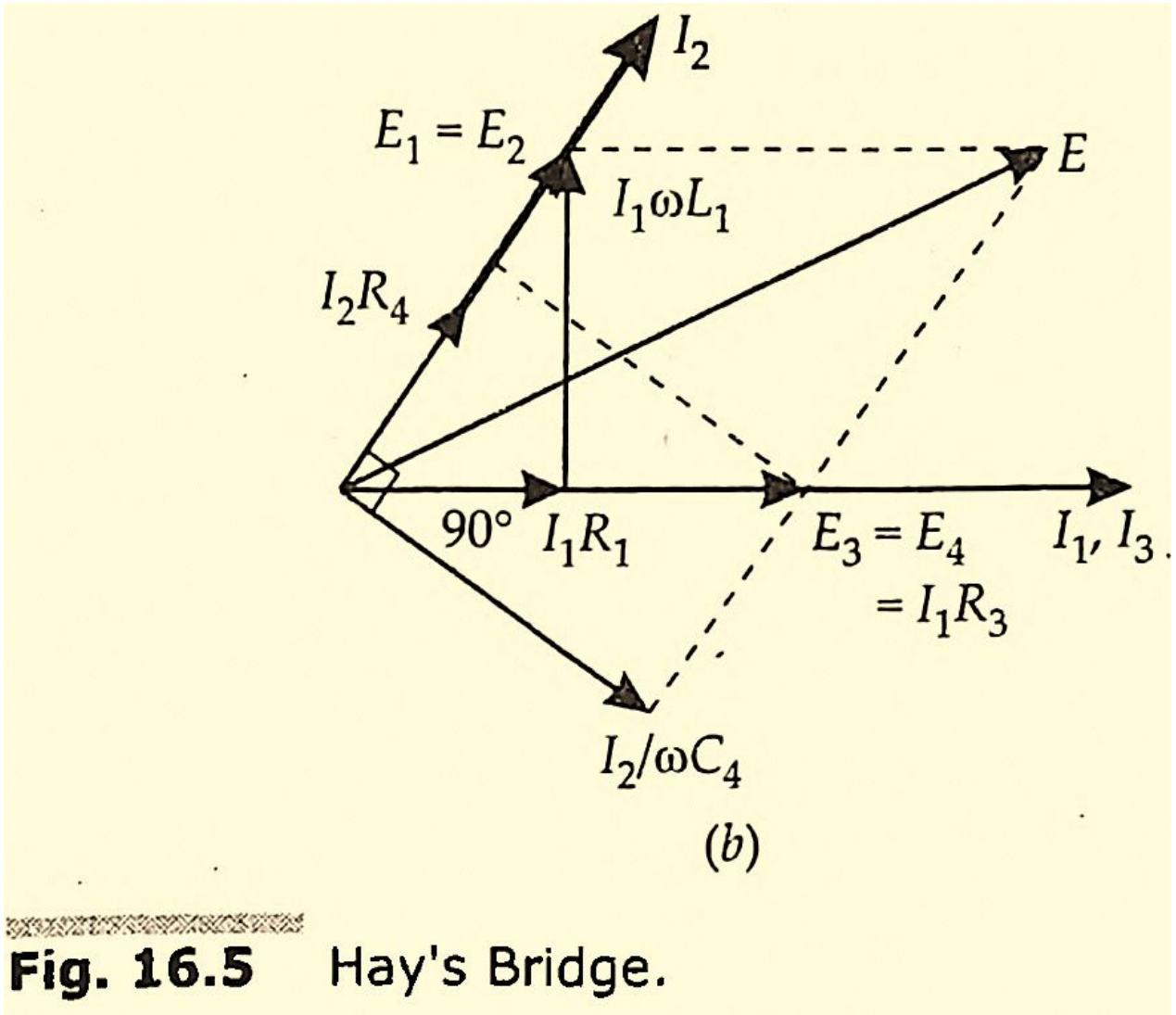
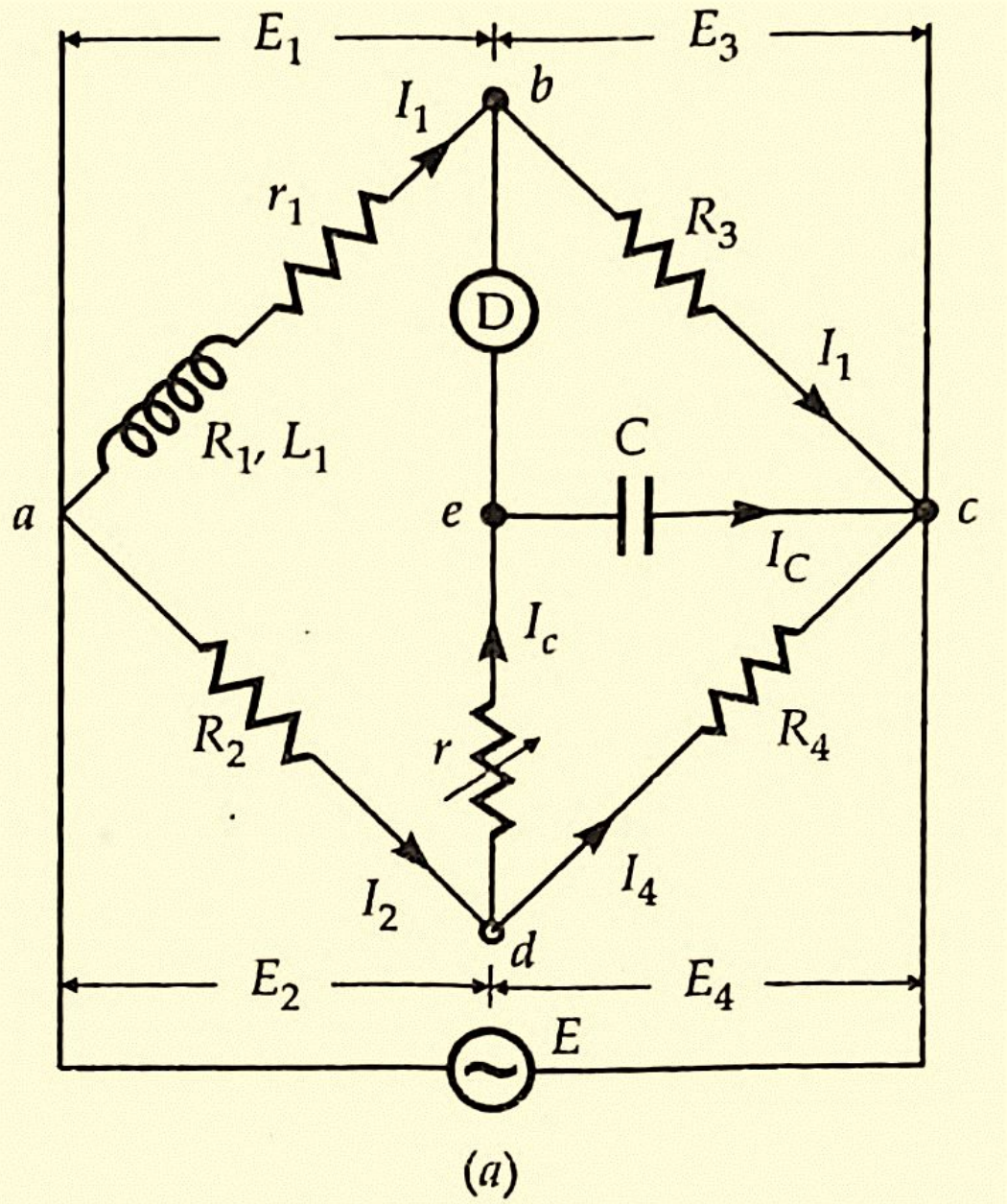


Fig. 16.5 Hay's Bridge.

Question: Differentiate between Maxwell's bridge and Hay's bridge on the basis of Q-factor.

Anderson's Bridge



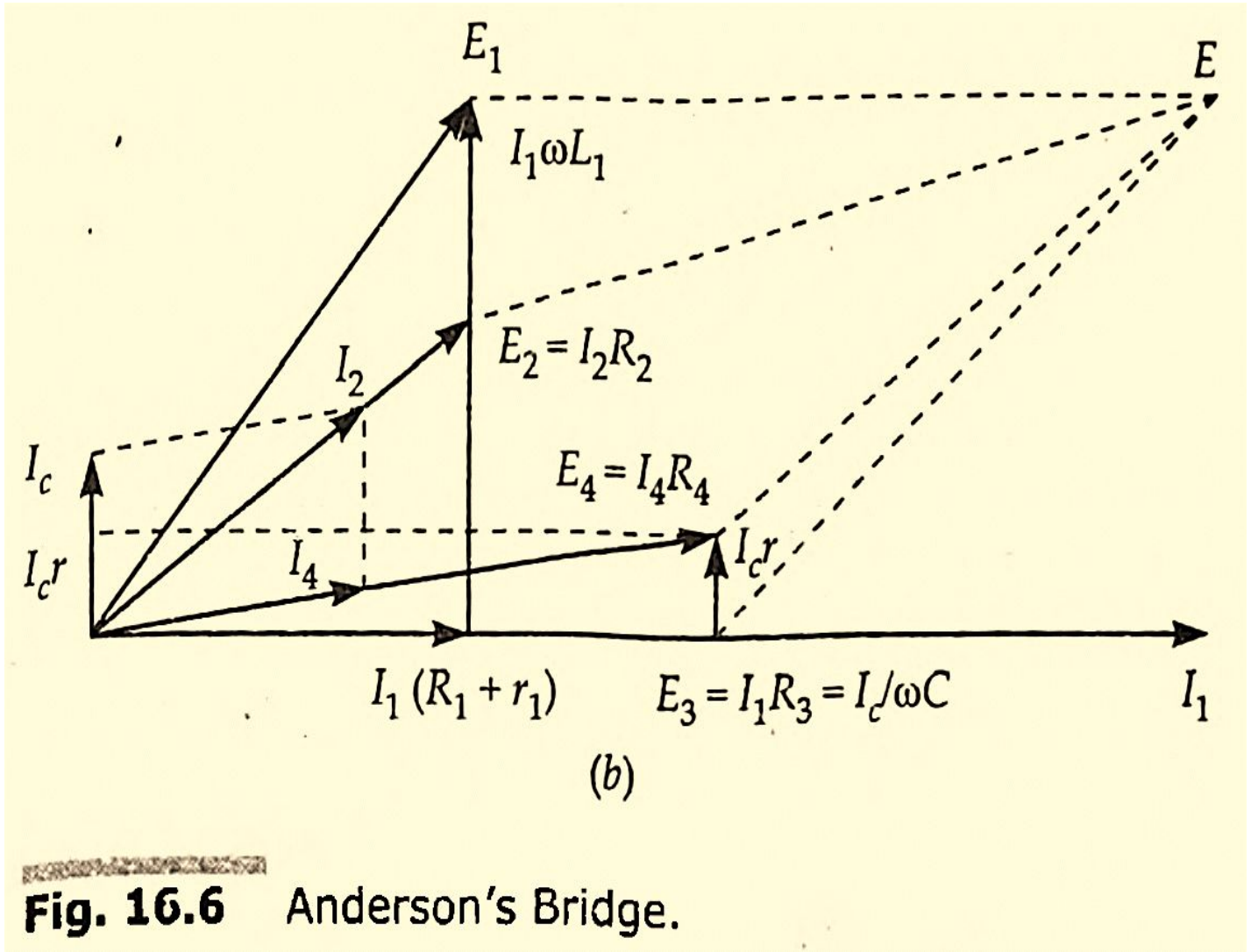
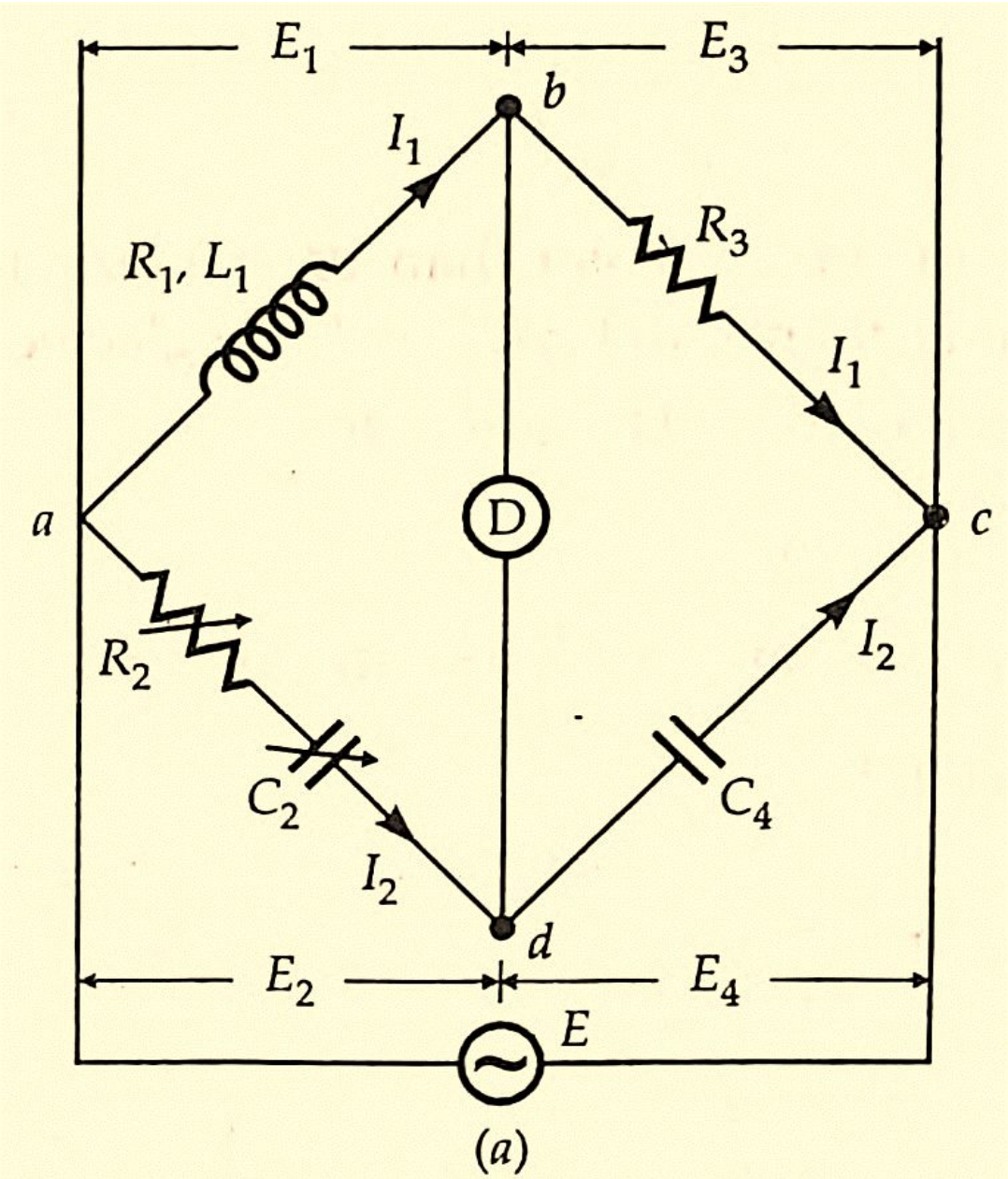


Fig. 16.6 Anderson's Bridge.

Owen's Bridge



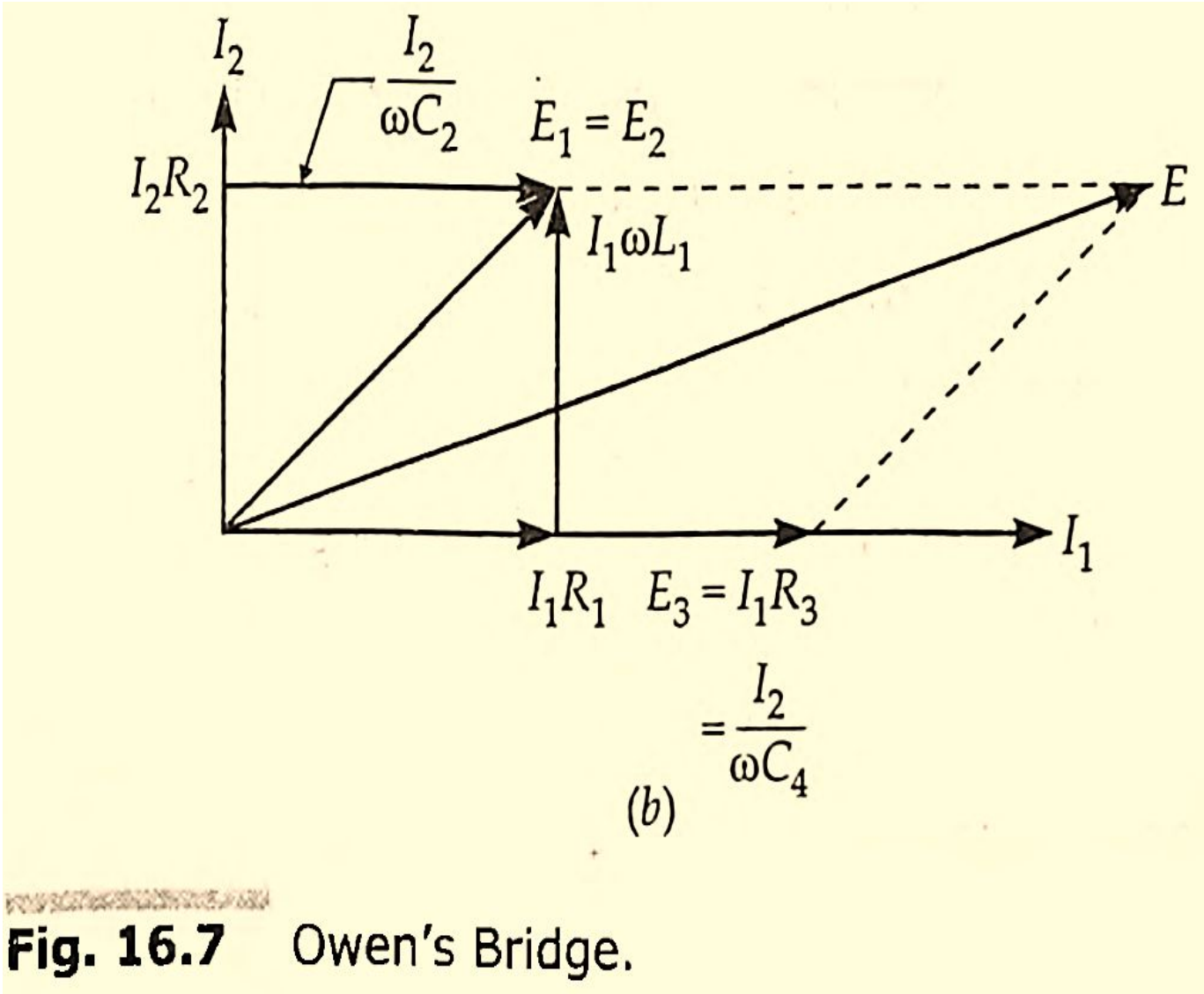
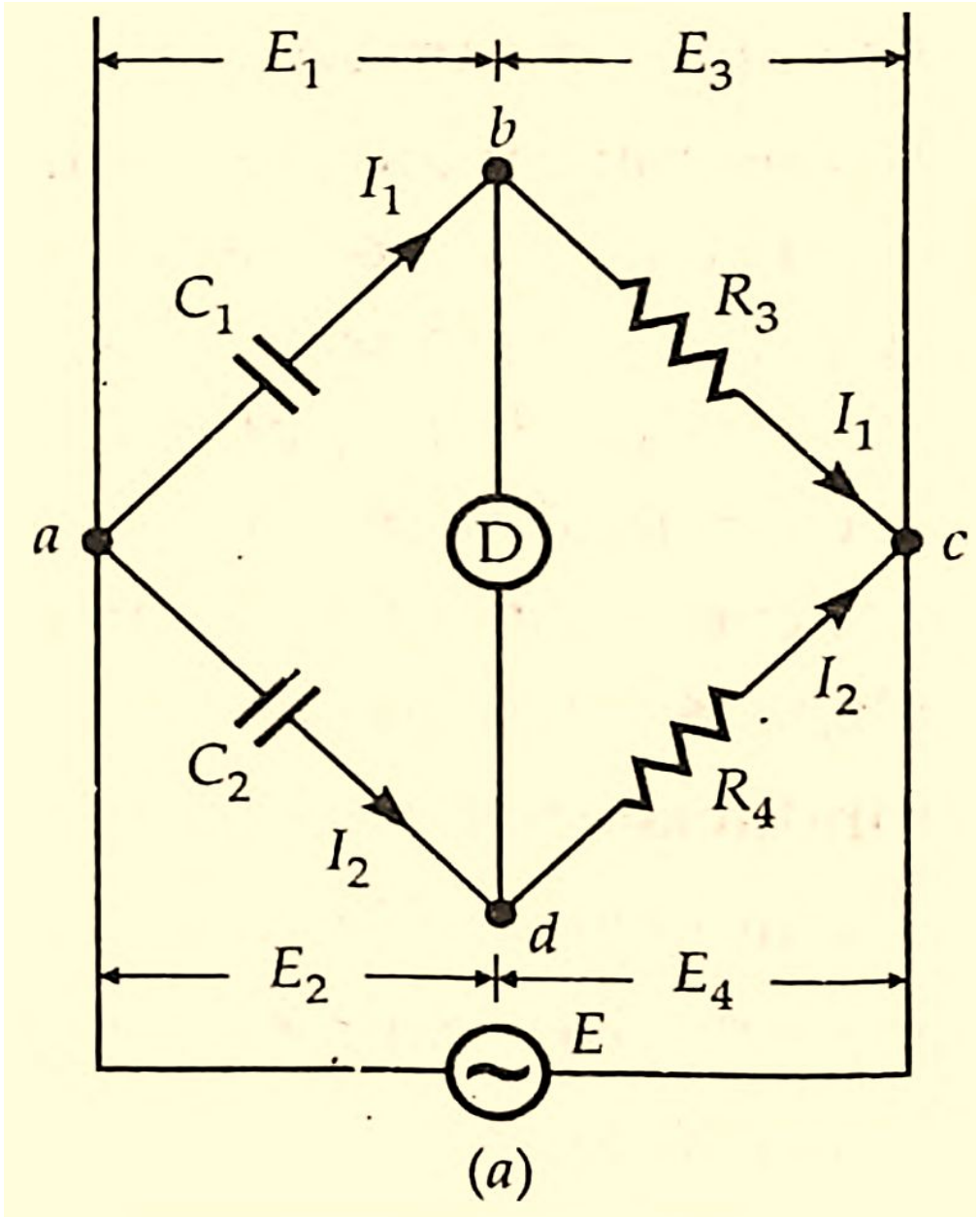


Fig. 16.7 Owen's Bridge.

De Sauty's Bridge



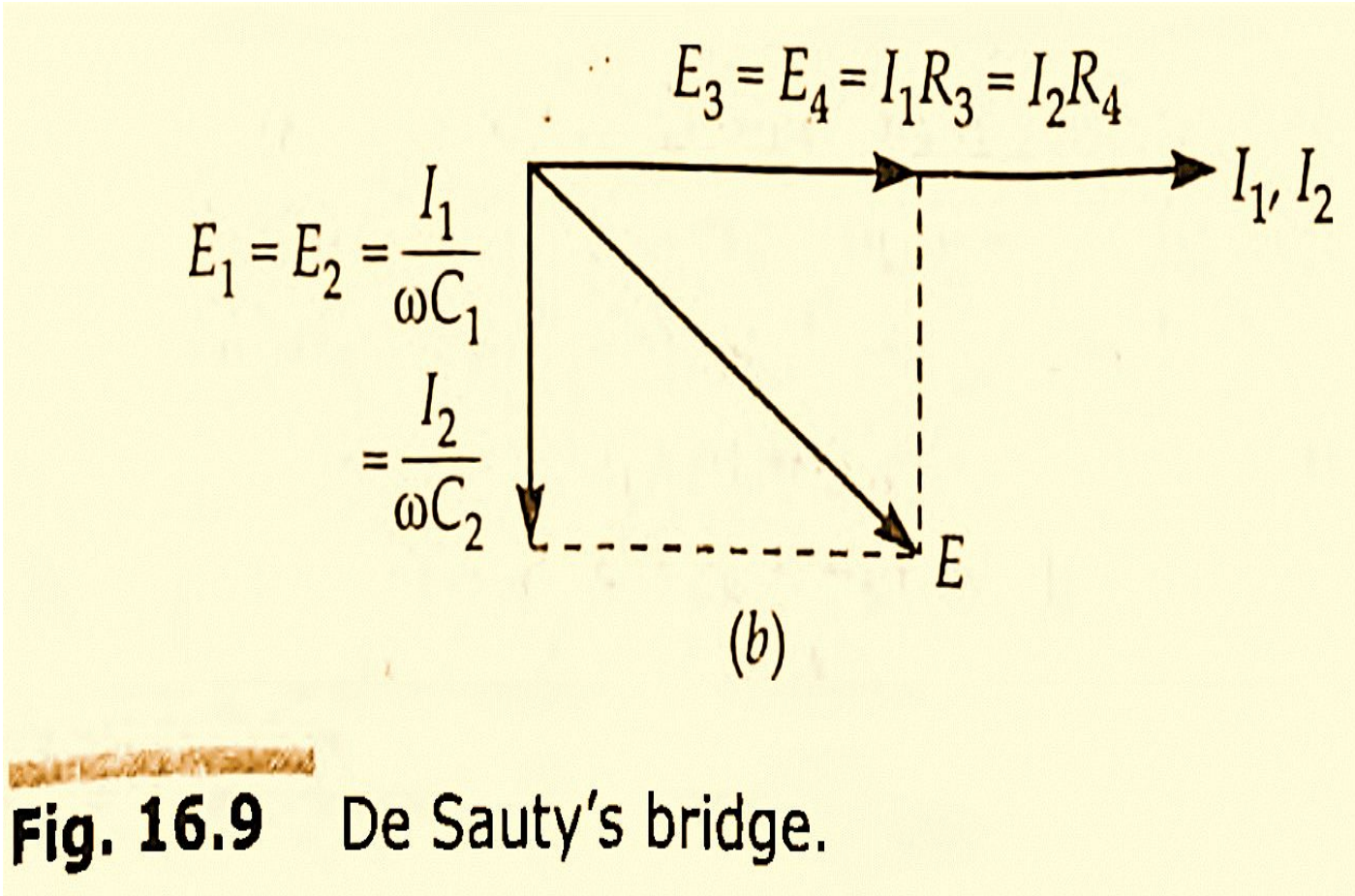
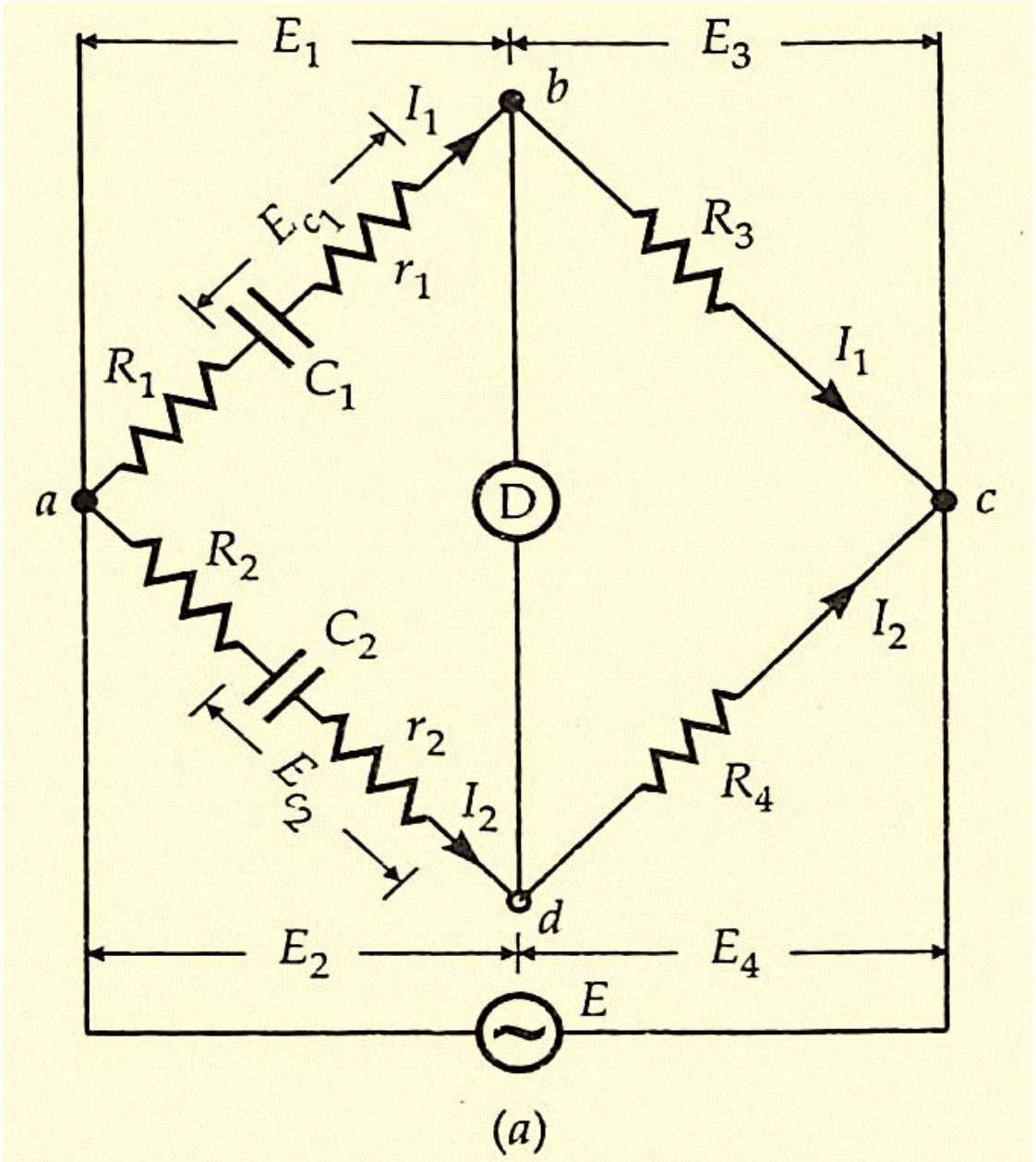


Fig. 16.9 De Sauty's bridge.

Modified De Sauty's Bridge



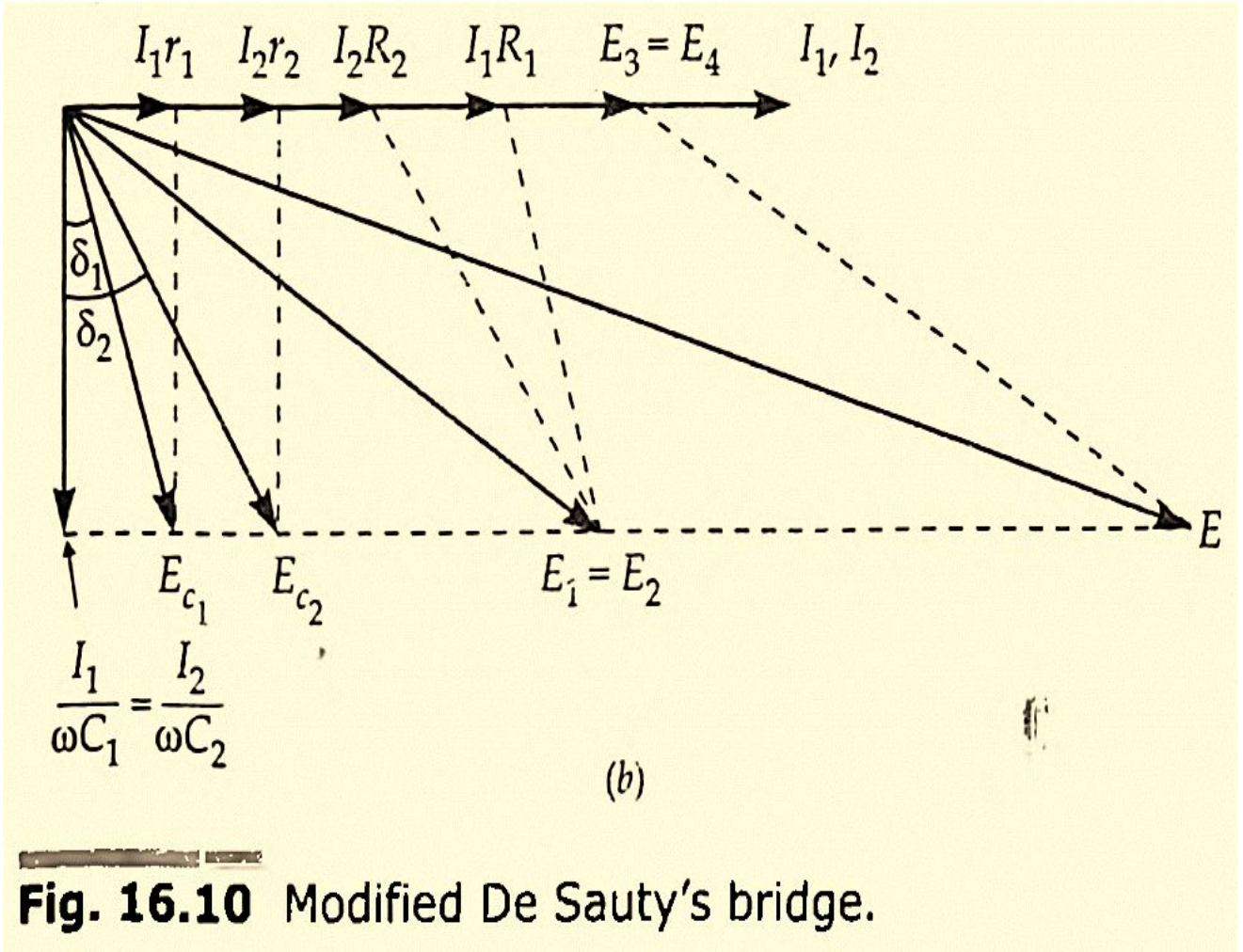
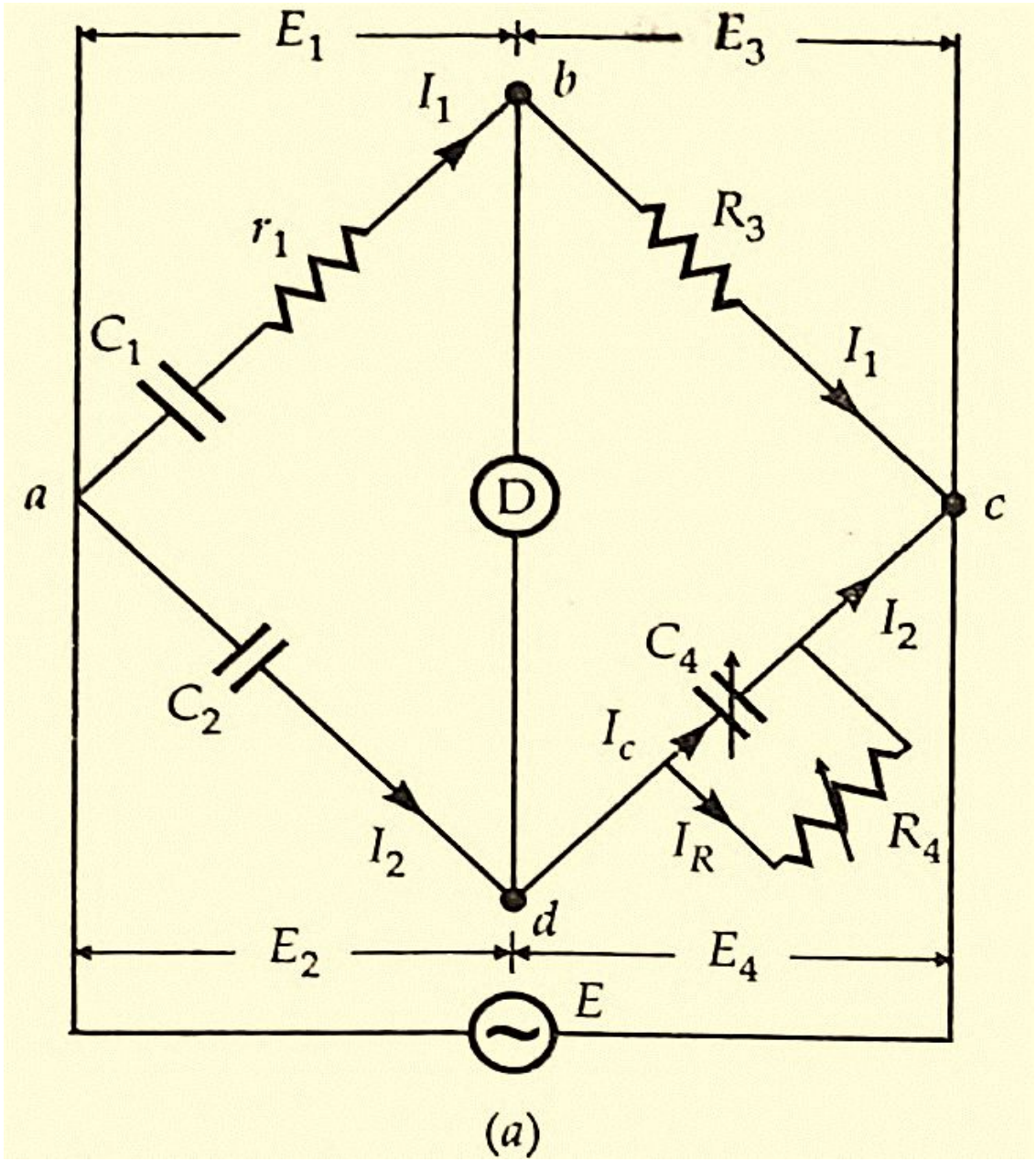


Fig. 16.10 Modified De Sauty's bridge.

Low Voltage Schering Bridge



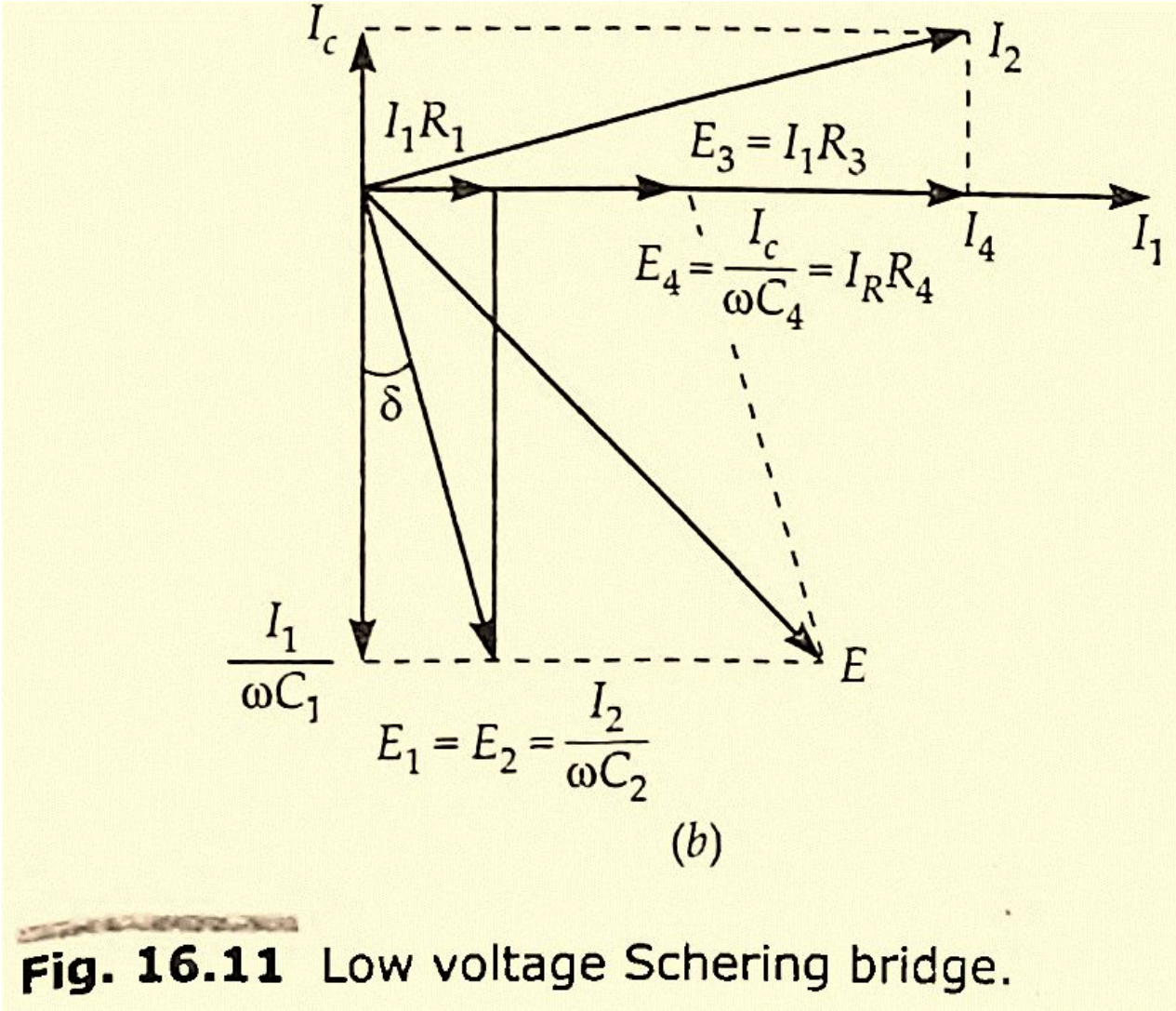


Fig. 16.11 Low voltage Schering bridge.

Measurement of Frequency: Wien's Bridge

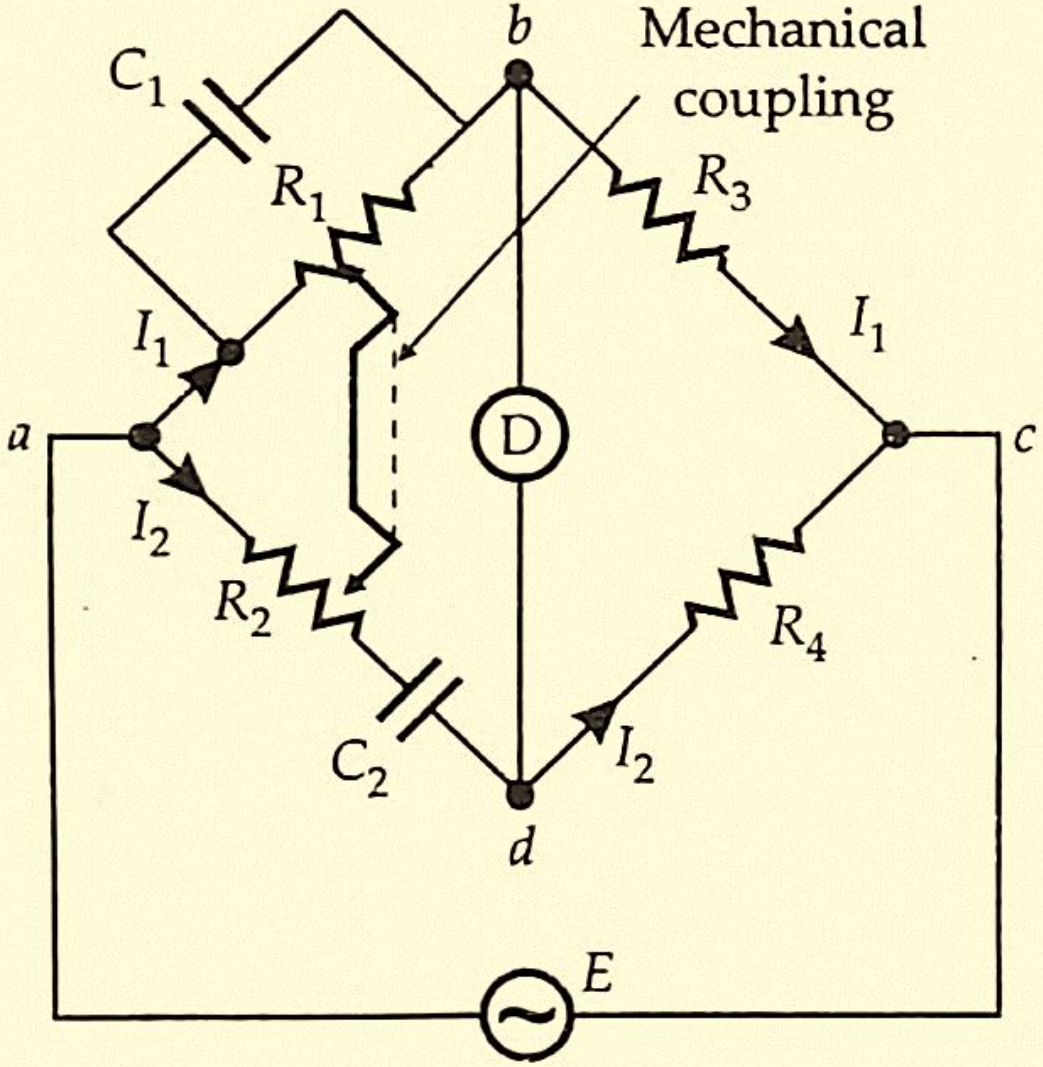


Fig. 16.20 Wien's Bridge.