

CONTENTS.

— O —

SECTION I.

DEFINITIONS AND GENERAL PRINCIPLES.

Foot-Pound—Torque—Heat—B.T.U.—Steam—Table of Properties of Saturated Steam—Adiabatic Expansion and Isothermal Expansion—Dryness Fraction—Total Heat, &c.—Potential and Kinetic Energy—Blade Friction—Condensation Principle of Turbine—De-Laval Turbine—Parsons Turbine—Parallel Flow—Action of Steam in Parsons Turbine—Turbine Arrangements—Steam Flow through Turbines—Increase of Steam Volume, &c.—Blade Heights—Expansion Clearance—Blade Variation—Velocity Calculations—Absolute and Relative Velocity—Guide and Moving Blades—Work of Steam Acceleration—Blade Velocity—Steam Velocity—Heat Drops—Work done by Adiabatic Expansion—Vacuum in L.P. Turbines—Pressure Drops—Blades per Row—Tip Leakage—Turbine Efficiency—Actual Volumes of Steam in Turbines—Velocity Triangles—Number of “Expansions”—Packing Pieces—“Wing” Blades—Blade and Steam Speed Ratios—Cruising Turbines—Expansion Allowance—Cruising Thrusts—Cruising Turbine Glands and Drains—Steam Connections—Reverse Turbines—H.P. and L.P. A stern Turbines—Horse-Power of Turbines—Equivalent I.H.P.—Turbine Work Diagram—Number of Blade Rows—Initial Steam Velocity—Rotor and Dummy Diameters Compared—Water Condensed in Turbines—Power Developed by Turbines, &c.

PAGES

1-62

SECTION II.

WORKSHOP PRACTICE.

General—Construction of Rotors—Building of Rotors—Turning of Rotors—Turbine Casings—Blading: Various Systems—Blading of Rotors and Casings—Balancing of Rotors—Dummies—Main Bearings and Adjusting Blocks—Oil Baffles—Thrust Block—Adjusting of Dummy Clearance—Bedding of Rotors—Steaming of Turbines—Guide Columns—Turbine Casing Drains—Steam Connections—Turbine Mountings—Dummy Adjusting Gear—Calibration of Turbine Shafts—Forced Lubrication

63-137

SECTION III.

DATA FROM ACTUAL PRACTICE.

	PAGES
Steam Pressures and Volumes—Steam Volumes in Turbines—Heat Drop —Trials of U.S.S. "Chester"—Trials of "Lusitania"—Blade Tip Clearances—Fast Channel Steamer—Gland Pressures—"Carmania," "Mauretania," and "Lusitania"—Wear Down of Bearings—Tip Clearance—Turbine Pressure Data—Cross-Channel Steamers, &c.— Consumptions, &c.—High Vacuum—Speed Trials—Turbines in Vacuum—Coal Consumption—Blade Dimensions—"Dry" Air Pump —Governors—Wear and Corrosion—Causes of Breakdown—Number of Blades in "Expansions"—Trial Results, &c.—Turbine Efficiency —"Finger Plate" and "Bridge Gauge"—Drainings from Turbines— Blading Lists—Oil to Glands—Draining of Dummies—Micrometer Gauge—Propellers—Turbine and Propeller Efficiency Combined— Speed of Rotation—Propellers and Power—The "Curtis" Marine Turbine	138-254

SECTION IV.

TORSION METERS, &c.

The Bevis-Gibson Torsion-Meter—Turbine Advantages—Denny and Johnson Torsion-Meter—Recent Improvements in Turbine Construc- tion and Design—Running and Upkeep of Turbines—Combined Reciprocating Engines and Turbines—Boilers, Condensers, and Auxiliary Machinery—Problems for Junior Students—Solutions to Problems	255-323
--	---------

APPENDIX.

GENERAL NOTES.

Dummy Readings from Practice—Wear Down of Main Bearings— Efficiency of "Lusitania" Turbines—Propulsive Efficiency—Loss of Power due to "Windage"—Condition of Turbines after Service	324-328
--	---------

INDEX

329-337