

CONTENTS

Publisher's Note	vii	Diesel, Rudolf	140
Introduction	ix	Differential Equations	143
Contributors	xiii	Discoveries of Archimedes	147
Acceleration	1	Displacement	149
Acoustics	3	Dynamics (mechanics)	150
Aerodynamics	12	Earthquake Engineering	155
Aeronautical Engineering	18	Elasticity	160
Aerospace Design	22	Electromagnet Technologies	164
Ailerons, Flaps, and Airplane Wings	26	Electromagnetism	171
Airfoils	28	Engineering	177
Airplane Propellers	31	Engineering Tolerances	184
Amplitude	34	Equilibrium	186
Angular Forces	38	Equivalence Principle	190
Angular Momentum	41	Euclid	194
Archimedes	46	Euclidean Geometry	198
Archimedes's Principle	50	Euler Paths	204
Aristotle Isolates Science as a Discipline	53	Euler's Laws of Motion	205
Atoms	55	External Combustion Engine	208
Automated Processes and Servomechanisms	59	Fluid Dynamics	213
Ballistic Weapons	65	Fluid Mechanics and Aerodynamics	217
Bernoulli, Daniel	69	Flywheels	221
Bernoulli's Principle	72	Force (physics)	224
Billiards	75	Friction	227
Biomechanics	77	Galileo	233
Biomedical Engineering	82	Gauss's Law	236
Calculating System Efficiency	85	Grimaldi Discovers Diffraction	239
Calculus	87	Harmonic Oscillators	243
Carnot, Sadi	92	Heat Transfer	246
Celestial Mechanics	94	Helicopters	252
Centrifugation	97	Hertz, Heinrich Rudolf	259
Chaotic Systems	102	Hooke, Robert	261
Circular Motion	106	Hydraulic Engineering	265
Civil Engineering	108	Hydraulics	270
Classical or Applied Mechanics	115	Hydrodynamics	276
Clausius Formulates the Second Law of Thermodynamics	121	Inertial Guidance	283
Computer-aided Engineering	124	Internal Combustion Engine	288
Conservation of Energy	127	Jet Engines	293
Coriolis Effect	131	Kinematics	299
D'Alembert's Axioms of Motion	135	Kinetic Energy	302
Diesel Engine	137	Kirchhoff, Gustav Robert	303
		Lagrange, Joseph-Louis	307
		Laplace, Pierre-Simon	311

Leibniz, Gottfried Wilhelm	314	Stabilizers	447
Lenz's Law	318	Statics	449
Linear Motion	321	Steam and Steam Turbines	450
Load	324	Steam Energy Technology	453
Magnetism	329	Steam Engine	459
Materials Science	331	Stirling, Robert	462
Mechanical Engineering	336	Structural Engineering	466
Mechatronics	345	Superconductor	469
Moment of Inertia	348	Surface Tension	472
Momentum (physics)	351	Tesla, Nikola	475
Motion	353	Thermodynamics	479
Nanotechnology	355	Torque	485
Newton, Isaac	361	Transportation	488
Newton's Laws	365	Tull, Jethro	491
Pascal, Blaise	371	Turbines	496
Pendulums	374	Turbojets and Turbofans	499
Photoelectric Effect	380	Turboprops	503
Plane Rudders	385	Vacuum	507
Plasticity (physics)	388	Vacuum Technology	510
Poisson, Siméon Denis	390	Vectors	512
Potential Energy	393	Vectors (mathematics and physics)	517
Projectiles	397	Velocity	520
Propulsion Technologies	401	Vibration	522
Quantum Mechanics	407	Work and Energy	529
Rigid-Body Dynamics	413	Work-Energy Theorem	532
Robotics	418	Young, Thomas	535
Rotary Engine	426		
Solenoid	429		
Solid Mechanics	432	Bibliography	539
Speed	437	Glossary	563
Springs	439	Organizations	587
Stability	443	Subject Index	589