

A Catechism of the Steam Engine

A catechism of the steam engine in its various applications to mines, mills, steam navigation, railways, and agriculture: with practical instructions for the manufacture and management of engines of every class

by John Bourne

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A CATECHISM

OF THE

STEAM ENGINE

IN ITS VARIOUS APPLICATIONS TO

MINES, MILLS, STEAM NAVIGATION, RAILWAYS,
AND AGRICULTURE.

WITH

PRACTICAL INSTRUCTIONS

FOR THE

MANUFACTURE AND MANAGEMENT OF ENGINES OF EVERY CLASS.

BY

JOHN BOURNE, C. E.

NEW AND REVISED EDITION.

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1868.

PREFACE

TO THE FOURTH EDITION.



FOR some years past a new edition of this work has been called for, but I was unwilling to allow a new edition to go forth with all the original faults of the work upon its head, and I have been too much engaged in the practical construction of steam ships and steam engines to find time for the thorough revision which I knew the work required. At length, however, I have sufficiently disengaged myself from these onerous pursuits to accomplish this necessary revision; and I now offer the work to the public, with the confidence that it will be found better deserving of the favorable acceptance and high praise it has already received. There are very few errors, either of fact or of inference, in the early editions, which I have had to correct; but there are many omissions which I have had to supply, and faults of arrangement and classification which I have had to rectify. I have also had to bring the information, which

the work professes to afford, up to the present time, so as to comprehend the latest improvements.

For the sake of greater distinctness the work is now divided into chapters. Some of these chapters are altogether new, and the rest have received such extensive additions and improvements as to make the book almost a new one. One purpose of my emendations has been to render my remarks intelligible to a tyro, as well as instructive to an advanced student. With this view, I have devoted the first chapter to a popular description of the Steam Engine—which all may understand who can understand anything—and in the subsequent gradations of progress I have been careful to set no object before the reader for the first time, of which the nature and functions are not simultaneously explained. The design I have proposed to myself, in the composition of this work, is to take a young lad who knows nothing of steam engines, and to lead him by easy advances up to the highest point of information I have myself attained; and it has been a pleasing duty to me to smooth for others the path which I myself found so rugged, and to impart, for the general good of mankind, the secrets which others have guarded with so much jealousy. I believe I am the first author who has communicated that practical information respecting the steam engine, which persons proposing to follow the business of an engineer desire to possess. My business has, therefore, been the rough business of a pioneer; and while hewing a road

through the trackless forest, along which all might hereafter travel with ease, I had no time to attend to those minute graces of composition and petty perfection of arrangement and collocation, which are the attribute of the academic grove, or the literary parterre. I am, nevertheless, not insensible to the advantages of method and clear arrangement in any work professing to instruct mankind in the principles and practice of any art; and many of the changes introduced into the present edition of this work are designed to render it less exceptionable in this respect. The woodcuts now introduced into the work for the first time will, I believe, much increase its interest and utility; and upon the whole I am content to dismiss it into circulation, in the belief that those who peruse it attentively will obtain a more rapid and more practical acquaintance with the steam engine in its various applications, than they would be likely otherwise to acquire.

I have only to add that I have prepared a sequel to the present work, in the shape of a Hand-Book of the Steam Engine, containing the whole of the rules given in the present work, illustrated by examples worked out at length, and also containing such useful tables and other data, as the engineer requires to refer to constantly in the course of his practice. This work may be bound up with the "Catechism," if desired, to which it is in fact a Key.

I shall thankfully receive from engineers, either

abroad or at home, accounts of any engines or other machinery, with which they may become familiar in their several localities ; and I shall be happy, in my turn, to answer any inquiries on engineering subjects which fall within the compass of my information. If young engineers meet with any difficulty in their studies, I shall be happy to resolve it if I can ; and they may communicate with me upon any such point without hesitation, in whatever quarter of the world they may happen to be.

JOHN BOURNE.

9 BILLITER STREET, LONDON,
March 1st, 1856.

P R E F A C E

TO THE FIFTH EDITION.



THE last edition of the present work, consisting of 3,500 copies, having been all sold off in about ten months, I now issue another edition, the demand for the work being still unabated. It affords, certainly, some presumption that a work in some measure supplies an ascertained want, when, though addressing only a limited circle—discoursing only of technical questions, and without any accident to stimulate it into notoriety,—it attains so large a circulation as the present work has reached. Besides being reprinted in America, it has been translated into German, French, Dutch, and I believe, into some other languages, so that there is, perhaps, not too much vanity in the inference that it has been found serviceable to those perusing it. I can with truth say, that the hope of rendering some service to mankind, in my day and generation, has been my chief inducement in

writing it, and if this end is fulfilled, I have nothing further to desire.

I regret that circumstances have prevented me from yet issuing the "Hand-Book" which I have had for some time in preparation, and to which, in my Preface of the last year, I referred. I hope to have sufficient leisure shortly, to give that and some other of my literary designs the necessary attention. Whatever may have been the other impediments to a more prolific authorship, certainly one of them has not been the coldness of the approbation with which my efforts have been received, since my past performances seem to me to have met with an appreciation far exceeding their deserts.

JOHN BOURNE.

February 2d, 1857.

PUBLISHERS' NOTICE

IN offering to the American public a reprint of a work on the Steam Engine so deservedly successful, and so long considered standard, the publishers have not thought it necessary that it should be an exact copy of the English edition; there were some details in which they thought it could be improved, and better adapted to the use of American engineers. On this account, the size of the page has been increased to a full 12mo, to admit of larger illustrations, which in the English edition are often on too small a scale; and some of the illustrations themselves have been supplied by others equally applicable, more recent, and to us more familiar examples. The first part of Chapter XI, devoted in the English edition to English portable and fixed agricultural engines, in this edition gives place entirely to

illustrations from American practice, of steam engines as applied to different purposes, and of appliances and machines necessary to them. But with the exception of some of the illustrations and the description of them, and the correction of a few typographical errors, this edition is a faithful transcript of the latest English edition.

CONTENTS.

	PAGE
Classification of Engines.....	1
Nature and uses of a Vacuum.....	3
Velocity of falling Bodies and Momentum of moving Bodies.....	6
Central Forces.....	9
Centres of Gravity, Gyration, and Oscillation.....	12
The Pendulum and Governor.....	12
The Mechanical Powers.....	17
Friction.....	19
Strength of materials and Strains subsisting in Machines.....	25
CHAP. I.—GENERAL DESCRIPTION OF THE STEAM ENGINE.	
The Boiler.....	34
The Engine.....	46
The Marine Engine.....	55
Screw Engines.....	61
The Locomotive Engine.....	65
CHAP. II.—HEAT, COMBUSTION, AND STEAM.	
Heat.....	71
Combustion.....	73
Steam.....	82
CHAP. III.—EXPANSION OF STEAM AND ACTION OF THE VALVES.....	
CHAP. IV.—MODES OF ESTIMATING THE POWER AND PERFORMANCE OF ENGINES AND BOILERS.	
Horses Power.....	102
Duty of Engines and Boilers.....	108
The Indicator.....	112
Dynamometer, Gauges, and Cataract.....	116
CHAP. V.—PROPORTIONS OF BOILERS.	
Heating and Fire Grate Surface.....	121
Calorimeter and Vent.....	124
Evaporative Power of Boilers.....	130
Modern Marine and Locomotive Boilers.....	132
The Blast in Locomotives.....	134
Boiler Chimneys.....	133
Steam Room and Priming.....	140
Strength of Boilers.....	145
Boiler Explosions.....	149
CHAP. VI.—PROPORTIONS OF ENGINES.	
Steam Passages.....	154
Air Pump, Condenser, and Hot and Cold Water Pumps.....	159
Fly Wheel.....	165

	PAGE
Strengths of Land Engines.....	166
Strengths of Marine and Locomotive Engines.....	171
CHAP. VII.—CONSTRUCTIVE DETAILS OF BOILERS.	
Land and Marine Boilers.....	177
Incrustation and Corrosion of Boilers.....	188
Locomotive Boilers.....	199
CHAP. VIII.—CONSTRUCTIVE DETAILS OF ENGINES.	
Pumping Engines.....	206
Various forms of Marine Engines.....	214
Cylinders, Pistons, and Valves.....	218
Air Pump and Condenser.....	226
Pumps, Cocks, and Pipes.....	233
Details of the Screw and Screw Shaft.....	239
Details of the Paddles and Paddle Shaft.....	241
The Locomotive Engine.....	248
CHAP. IX.—STEAM NAVIGATION.	
Resistance of Vessels in Water.....	270
Experiments on the Resistance of Vessels.....	273
Influence of the size of Vessels upon their Speed.....	277
Structure and Operation of Paddle Wheels.....	278
Configuration and Action of the Screw.....	284
Comparative Advantages of Paddle and Screw Vessels.....	288
Comparative Advantages of different kinds of Screws.....	296
Proportions of Screws.....	304
Screw Vessels with full and auxiliary Power.....	303
Screw and Paddles combined.....	305
CHAP. X.—EXAMPLES OF ENGINES OF RECENT CONSTRUCTION.	
Oscillating Paddle Engines.....	308
Direct acting Screw Engine.....	323
Locomotive Engine.....	333
CHAP. XI.—ON VARIOUS FORMS AND APPLICATIONS OF THE STEAM ENGINE.	
Governor.....	342
Donkey Pumps.....	344
Portable Steam Engines.....	350
Stationary Engines.....	352
Steam Fire Engines.....	362
Steam Excavator.....	371
CHAP. XII.—MANUFACTURE AND MANAGEMENT OF STEAM ENGINES.	
Construction of Engines.....	378
Erection of Engines.....	388
Management of Marine Boilers.....	395
Management of Marine Engines.....	399
Management of Locomotives.....	403