

101  
G 185

A

# AINSLY'S ENGINEERS' MANUAL

OF THE

## LOCAL MARINE BOARD

### EXAMINATIONS,

FOR CERTIFICATES OF COMPETENCY, AS SECOND AND FIRST-CLASS ENGINEERS,



(WITH UPWARDS OF ONE HUNDRED AND FIFTY  
ILLUSTRATIVE DIAGRAMS, &c.)

Revised by TOM WAKE, Extra First-class Engineer, &c., Engineer  
and Nautical Academy, Athenæum, West Hartlepool.

*Twenty-fifth Edition.*

[Entered at Stationers' Hall.]

SOUTH SHIELDS:

PRINTED AND PUBLISHED BY THOMAS L. AINSLEY, MILL DAM.  
LONDON: R. H. LAURIE, 35, MINORIES; NORIE & WILSON, 136, MINORIES;  
J. IMRAY AND SON, 89, MINORIES; E. & F. N. SPON, CHURCH LANE;  
SIMPSON, MARSHALL, HAMILTON, KENT & Co., LIMITED, STATIONERS' HALL COURT;  
SAMPSON, LOW, MARSTON, & Co., FLEET STREET.  
GEORGE PHILIP AND SON, 32, FLEET STREET.  
LIVERPOOL: PHILIP & Co., LIMITED, CAXTON BUILDINGS.  
MELBOURNE AND SYDNEY: G. ROBERTSON.]

1904 .

A

SOUTH SHIELDS :  
THOMAS L. AINSLEY, PRINTER, MILL DAM,

РОССИЙСКОЕ  
ГОСУДАРСТВЕННАЯ  
БИБЛИОТЕКА

№ 7522-99  
1



## PREFACE.

---

THIS Work is intended for the use of Engineers desirous of obtaining Certificates of Competency, either as Second-Class or First-Class Engineer. The Work is drawn up with a view to *self-instruction*, or for the use of Schools.

It contains rules for working out the several Problems that are presented to candidates, with model solutions of, and numerous exercises to each Problem. A number of Examination Papers are also given. The chapter on the "Indicator" is illustrated by a large number of choice Diagrams, taken from Engines by the most eminent makers—including some from the Screw and Paddle Engines of the *Great Eastern*; H.M.S.S. *Nile*; the Iron-clad *Research*; the R.M.S.S. *China*; the *Sea King* (Confederate Cruiser); the S.S. *Hansa*, &c., &c.; also some rare and valuable ones from a *Compound Marine Engine* by Messrs. ROWAN & Co., &c. This species of engine combines the various improvements of a high pressure of steam with superheating and surface condensation, and is reported by Professor RANKINE to have acted with a smaller consumption of fuel than has been hitherto attained in any engine whatever.

The mode of reading Indicator Diagrams is fully treated of, and also practical hints are given as to the important information to be obtained from them. It also contains chapters on Surface Condensers, Superheated Steam, Proportions of Engines, and such other related subjects as are required for the *viva voce* Examinations.

The Answers are given in full at the end of the book, with copious details of the intermediate parts of the solution.

T. L. A.

*South Shields, July 15th, 1865.*

ADVERTISEMENT TO TWENTY-FIFTH EDITION.

---

THE present Edition of the Engineers' Manual has been thoroughly revised, and a number of New Examination Papers added, arranged in the form as at present given at the Examinations.

A chapter on the Verbal Questions, and several cards from Triple Expansion Engines, have been introduced.

TOM WAKE.

*January, 1904.*

## ERRATA ET CORRIGENDA.

---

Page 50—Example 11, for 7020 read 7920.

- „ 144—Bottom line, for that which is *divided* by the quotient read *denoted* by the quotient.
- „ 168—For  $\frac{2\frac{2}{7}}{7}$  read  $\frac{3\frac{2}{7}}{7}$ , and for  $\frac{1\frac{8}{7}}{7}$  read  $\frac{1\frac{8}{7}}{7}$ .
- „ 551—Paper V, Set B, No. 4—for diameter  $1\frac{1}{2}$ " read  $1\frac{1}{3}$ ".
- „ 644—Answer 91.  $1200 = \text{pitch} \times \text{revolutions} \times 1100 = \text{speed of ship}$ , should read  
 $1200 = \text{pitch} \times \text{revolutions}$ , and  $1100 = \text{speed of ship}$ .
- „ 671—Answer 115.  $\frac{90000 + t^2}{(L' + 1) + a''}$  should read  $\frac{90000 \times t^2}{(L' + 1) \times a''}$ .