# CHIMNEY DESIGN

CHRISTIE



D. VAN NOSTRAND
COMPANY

# CHIMNEY DESIGN AND THEORY

A BOOK FOR

ENGINEERS AND ARCHITECTS

BY

WILLIAM WALLACE CHRISTIE

CONSULTING ENGINEER; MEMBER OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS; MEMBER OF THE FRANKLIN INSTITUTE

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# PREFACE

UP to the present time, there has been but one book on the subject of "Chimneys" printed in the United States, that of Armstrong's, revised by F. E. Idell, and published in the "Van Nostrand Science Series." It is a treatment of chimney-draft only. Other than this, the only book of any pretension is that of Bancroft's, an English book, published in 1885, and no longer obtainable. Thus it may be seen that there is no book which contains the latest practice in regard to the theory and designing of chimneys as built in the United States.

The Transactions of the engineering societies and volumes of technical periodicals do not give very much that is of value excepting, however, the "Engineering News" and "Engineering Record," to whom, with Mr. Henry C. Meyer, Jr., I am especially grateful for courtesies extended.

Whenever any extracts are made use of they are credited as far as possible to their source, and my thanks are tendered for the use of same, and to Mr. F. E. Idell for many valuable suggestions and criticisms.

The absence of data on this important subject has induced me to prepare this treatise, and if it meets with the same success that attended my pamphlet, "Chimney Formulæ and Tables," 1897, and will prove to be a source of information and assistance to designers, my object will be attained.

WILLIAM WALLACE CHRISTIE.

PATERSON, N. J., May, 1899.

## PREFACE TO THE SECOND EDITION

For a second edition the book has been revised throughout, some twenty-five pages of text and twelve full-page illustrations being added.

Radial brick chimneys, which were just being introduced in the United States as the first edition went to press, are now treated of briefly.

I have tried in a limited space to round out the work, thus meeting some of the criticisms made by the reviewers of the original publication, and I will be grateful for any suggestions that may be sent me looking to the further improvement of the work.

Mechanical draft is not enlarged upon, it being a subject by itself.

I desire to thank those who by their interest in the first edition have made this revision now possible.

WILLIAM WALLACE CHRISTIE.

March, 1902.

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### INTRODUCTION AND HISTORY

#### INTRODUCTORY

The most prominent feature to the world at large, of every steam or power plant, and that by which the manufacturing character of a village or city is most easily distinguished, is the chimney.

It is an engineering work which is often given but little thought, so far as the proper size and proportions for the best results are concerned, by those for whom it is to be built.

Nothing in a steam plant is so conducive to great waste of fuel as a badly designed chimney; and it may be made the means of assisting or increasing a high efficiency in the plant, if properly proportioned for the quantity of gases which is to be passed through it.

Chimneys are built of brick, or steel, or stone; steel chimneys being sometimes stayed or guyed with iron rods or wire rope, and sometimes built self-sustaining; in all cases chimneys are set on heavy masonry foundations.

In the following pages the adjuncts and various types of chimneys will be treated separately.

#### Historical Notes.

According to Tomlinson, chimneys were probably in use in England before those of Padua, of which the earliest record is the year 1368, when Carrara, Lord of Padua, introduced them in Rome.