

**ELECTRICITY IN THEORY  
AND PRACTICE: OR,  
THE ELEMENTS OF  
ELECTRICAL ENGINEERING**

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Electricity in Theory and Practice: Or, The Elements of Electrical Engineering by Bradley A. Fiske

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**BRADLEY A. FISKE**

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# ELECTRICITY

IN THEORY AND PRACTICE;

OR,

THE ELEMENTS

OF

# ELECTRICAL ENGINEERING.

BY

LIEUT. BRADLEY A. FISKE, U. S. N.

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## PREFACE.

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THE design of this book is to form a bridge between the many works written on the theory of electricity and the many works written on its practical applications. It has been my experience that practical men and students have found great difficulty in seeing the relation between the theory of electricity and its practical applications, because they have had to study the theory from books devoted wholly to abstruse theory, and the practical applications from books devoted wholly to the practical applications. I have, moreover, been often told by practical men that a book showing the principles upon which practice depends, and explaining *the theory of the practical applications*, would be a help to many. This want I have tried to meet. May be my endeavor will at least serve to stimulate abler hands to labor in what seems to me a very useful field.

I owe much to the leading electrical journals: the New York *Electrician*, *Electrical Review*, and *Electrical World*, the London *Electrical Review* and *Electrician*, and *La Lumière Électrique*, as well as to the admirable writ-

ings of Professors Thompson, Ayrton, and Perry, Messrs. Cumming, Prescott, and many others. I am indebted also to Messrs. Edison and Weston and the *Electrical World* for valuable cuts, and to Mr. S. D. Mott for kind assistance in preparing the illustrations.

BUREAU OF ORDNANCE, NAVY DEPARTMENT,  
Washington, D. C., Oct. 2, 1883.

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#### NOTE.

It will be observed that the percentages, 85 per cent. and 80 per cent., given in the sixteenth and eighteenth chapters, do not indicate the real efficiency of a motor, but merely the ratio of the mechanical power given out to C'E'. The real efficiency is, of course, the ratio of the mechanical power given out to C' multiplied by the difference of potential between the brushes.



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