The Electrical Engineer is now confronted with a variety of new problems for whose solution he must look to a full development of the science of electro-dynamics. This in the near future will stand in the same relation to the electric-motor that the science of thermo-dynamics stands in now to the steam engine. And since no branch of dynamics has a better claim to be called an exact science than electro-dynamics, it will be able to offer not enly convincing but final solutions of these problems. To apply the principles of electro-dynamics to the direct-current motor is the aim of this book.

Writing for Electrical Engineers particularly, I take for granted a certain acquaintance with the use and design of motors, but, as the book is intended to be of service to engineers generally, unexplained technicalities have been avoided as far as possible.

There are now so many excellent text books on electricity and magnetism, that I offer no apology for omitting discussion of elementary principles here.

I have not considered it necessary to allude to the subject of self-induction, except in connection with the question of sparking. The advanced student will perceive the analogy between the law of acceleration given in Chapter VII. and that for the rise of current in an inductive circuit, and may be tempted to pursue the subject for himself.

The numerical accuracy attempted has been limited to that attainable with an ordinary ten-inch slide rule, on which all the examples have been worked out. Importance is attached to the graphic method of solution, and the diagrams we intended to serve as exercises for the student, who should work, at similar problems with different data by the same methods.

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