

THE AIR PROPELLER

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649418855

The Air Propeller by Frederick Bedell

Except for use in any review, the reproduction or utilisation of this work in whole or in part in any form by any electronic, mechanical or other means, now known or hereafter invented, including xerography, photocopying and recording, or in any information storage or retrieval system, is forbidden without the permission of the publisher, Trieste Publishing Pty Ltd, PO Box 1576 Collingwood, Victoria 3066 Australia.

All rights reserved.

Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

This book is sold subject to the condition that it shall not, by way of trade or otherwise, be lent, re-sold, hired out, or otherwise circulated without the publisher's prior consent in any form or binding or cover other than that in which it is published and without a similar condition including this condition being imposed on the subsequent purchaser.

www.triestepublishing.com

FREDERICK BEDELL

**THE AIR
PROPELLER**

THE AIR PROPELLER

BOOKS BY THE AUTHOR

On Electricity

The Principles of the Transformer

Direct and Alternating Current Manual

Experiments with Alternating Currents (being Part II of Volume II of A Laboratory Manual of Physics, edited by E. L. Nichols)

Alternating Currents: an Analytical and Graphical Treatment for Students and Engineers (jointly with A. C. Crehore)

Also, editions in French and German

On Aerodynamics

Airplane Characteristics, 1918; cloth, \$1.60.

The Air Propeller, 1919; paper, \$1.00.

The Airplane, in preparation for 1920; cloth, \$3.00.

Most of the chapters in this volume will consist of material to be published therein for the first time. Six chapters will consist essentially of material that has appeared in the two preceding volumes, revised and amplified.

Orders for any of the foregoing works may be sent to D. Van Nostrand Company, 25 Park Place, New York.

THE AIR PROPELLER

Its working characteristics and theory,
together with a brief discussion of the
airplane engine and the power avail-
able for airplane propulsion

BY

FREDERICK BEDELL, PH. D.

Professor in Physics, Cornell University
Author of Airplane Characteristics, etc.

Member Aeronautical Society of America, Past Vice-President
American Institute of Electrical Engineers, Fellow and Past
General Secretary American Association for the Advancement
of Science, Member the American Physical Society and Manag-
ing Editor of The Physical Review.

ILLUSTRATED

Library of
California

NEW YORK
D. VAN NOSTRAND COMPANY
25 PARK PLACE

1919

12/3/20

TL705
34

COPYRIGHT 1919
BY
FREDERICK BEDELL

UNIV OF
CALIFORNIA

PREFACE

It is with some hesitation that the writer adds to the literature of the propeller. He has been lead to do so, however, because many discussions of the subject are unsatisfying and in some cases are not in accord with fact. Indeed, misconceptions of the behavior of a propeller are not uncommonly held even by those who are otherwise well-informed on aerodynamic subjects.

The author has endeavored to present a brief and simple treatment of the propeller for those who want a practical working knowledge of its characteristics and a general knowledge of its theory. It is believed that the treatment will at the same time serve as a general introduction for those who wish to pursue the subject further and to make a more detailed study of the propeller, either in its theoretical or practical aspects.

As the material herein is soon to be revised and republished* in another form, the author would welcome criticism, and would be pleased to have his attention called to any error or obscurity in presentation. He desires to thank Professor S. Noda, Honorary Fellow in Physics, Cornell University, for valuable assistance in the preparation of this book, particularly in the calculation of the characteristics of the propeller.

ITHACA, N. Y.,
August, 1919.

*To be included in *The Airplane*, now in preparation; see notice preceding title page.

B

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

CONTENTS

	PAGE
POWER AVAILABLE FROM THE AIR PROPELLER AND THE AIRPLANE ENGINE - - - - -	9
THE AIRPLANE ENGINE - - - - -	11
THE AIR PROPELLER	
(a) Introductory - - - - -	19
(b) Conditions of Propeller Operation - - - - -	25
(c) Propeller Characteristics - - - - -	31
(d) Propeller Theory - - - - -	67
APPENDIX	
Glossary - - - - -	77
Power Characteristics (power required) - - - - -	91