

**TEETH OF WHEELS, COMPREHENDING
PRINCIPLES, AND THEIR APPLICATION
IN PRACTICE, TO MILLWORK AND
OTHER MACHINERY. WITH
NUMEROUS FIGURES**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649054442

Teeth of Wheels, Comprehending Principles, and Their Application in Practice, to Millwork and Other Machinery. With Numerous Figures by Robertson Buchanan & Peter Nicholson

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

ROBERTSON BUCHANAN & PETER NICHOLSON

**TEETH OF WHEELS, COMPREHENDING
PRINCIPLES, AND THEIR APPLICATION
IN PRACTICE, TO MILLWORK AND
OTHER MACHINERY.
WITH NUMEROUS FIGURES**



TEETH OF WHEELS,

COMPREHENDING

PRINCIPLES, AND THEIR APPLICATION
IN PRACTICE,

TO

MILLWORK
AND OTHER MACHINERY.

WITH NUMEROUS FIGURES.

BY ROBERTSON BUCHANAN,
ENGINEER.

REVISED

BY PETER NICHOLSON, ARCHITECT, &c.

LONDON :

PRINTED BY AND FOR WILLIAM SAVAGE,
NO. 28, BEDFORD BURY.

1808.



PREFACE.

LED from situation, as well as curiosity, to attend very minutely to some parts of practical mechanics, one of the objects, which early attracted the notice of the author of the following short Essay, was the figure of the Teeth of Wheels. He observed, that, in forming these teeth, workmen followed rules for which they could assign no satisfactory reason. Nor did he then find in books the information he wanted: the subject seemed to him to require a detail and simplification, which no English writer, with whom he was acquainted, had given it.—After-

wards, indeed, he found that some French mathematicians had treated it with much attention. But their works, though sufficiently clear to those who have studied mathematics, are too abstract to be of general utility. In the following Essay, therefore, such an elucidation of the subject has been attempted, as might render it plain to the operative mechanic—an object, which will appear the more important, the more we consider the great variety of useful purposes to which wheel-work is applied.

De La Hire and Camus, are the two French writers, who have treated most extensively this branch of mechanics.—From the work of the latter, who has written more accurately, and more fully, the author has borrowed largely; nor has he scrupled to take from others,

whatever he found to suit his purpose, and to make the fullest use of the communications of his friends.

Of the method followed, it will be sufficient to remark, that the subject naturally suggested these two general divisions—First, the Principles of the Configuration of the Teeth of Wheels:—Secondly, the application of these to practice.

The first chapter contains the Principles—The second, their Application, with certain modifications—1st to *Spur Geer*, under which are comprehended, the *Wheel* and *Trundle*; the *Wheel* and *Pinion*; the *internal Pinion*, and the *Rack* and *Pinion*.—And, 2dly, to *Bevel Geer*.

A third chapter is added, which con-

tains a manner of forming *Spur Wheels*, upon principles somewhat different from those considered in the preceding chapter.

In the following pages, no pretensions are made, either to invention or profound investigation. The writer has studied perspicuity alone, and will have completely attained his object, if he has only been fortunate enough to give such a view of the various kinds of teeth, as will enable the artist to form some judgment of their respective merits, and to execute any of them with accuracy and ease. For this purpose it has been his aim to divest every part of the subject of obscurity, and to accommodate it to those who possess not the advantages of a mathematical education. But he is far from saying, that they will not find some difficulties, particularly in the first chap-

ter ; nor will they, perhaps, fully understand the truths it contains, till they see their relation to practice pointed out in the second.—He found, that without becoming exceedingly prolix, there was no avoiding the use of some mathematical terms, but of these he has given definitions, either as the terms themselves occur, or at the conclusion of the Essay*.

* This Preface was written several years before the translation of Camus was published.

1 Union Place, Glasgow,
February, 1807.

14

25

3

2

1

143

4

5