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Motor Vehicles and Motors

'Cheap or rapid or convenient road transport for man and goods is one of the most important of all contributions to national comfort and prosperity.' An early evangelist for the automobile, William Worby Beaumont (1848–1929) drew on his engineering background to produce the first volume of this work in 1900, when motor vehicles were still relatively new to British roads. Rapid developments in the automotive industry prompted the publication of a second volume in 1906. Replete with technical drawings and photographs, the work describes in great detail the design, construction and operation of the earliest motor vehicles, including those powered by steam, electricity and fuels derived from oil. Volume 1 traces the development of the automobile, from various attempts to produce steam vehicles light enough to run on roads through to the advances of Daimler and Benz. It also includes an overview of attempts to harness electrical power to propel road vehicles.

Cambridge University Press

978-1-108-07060-7 - Motor Vehicles and Motors: Their Design, Construction and Working by Steam, Oil and Electricity: Volume 1

W. Worby Beaumont

Frontmatter

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Motor Vehicles and Motors

*Their Design, Construction
and Working by Steam, Oil and Electricity*

VOLUME 1

W. WORBY BEAUMONT



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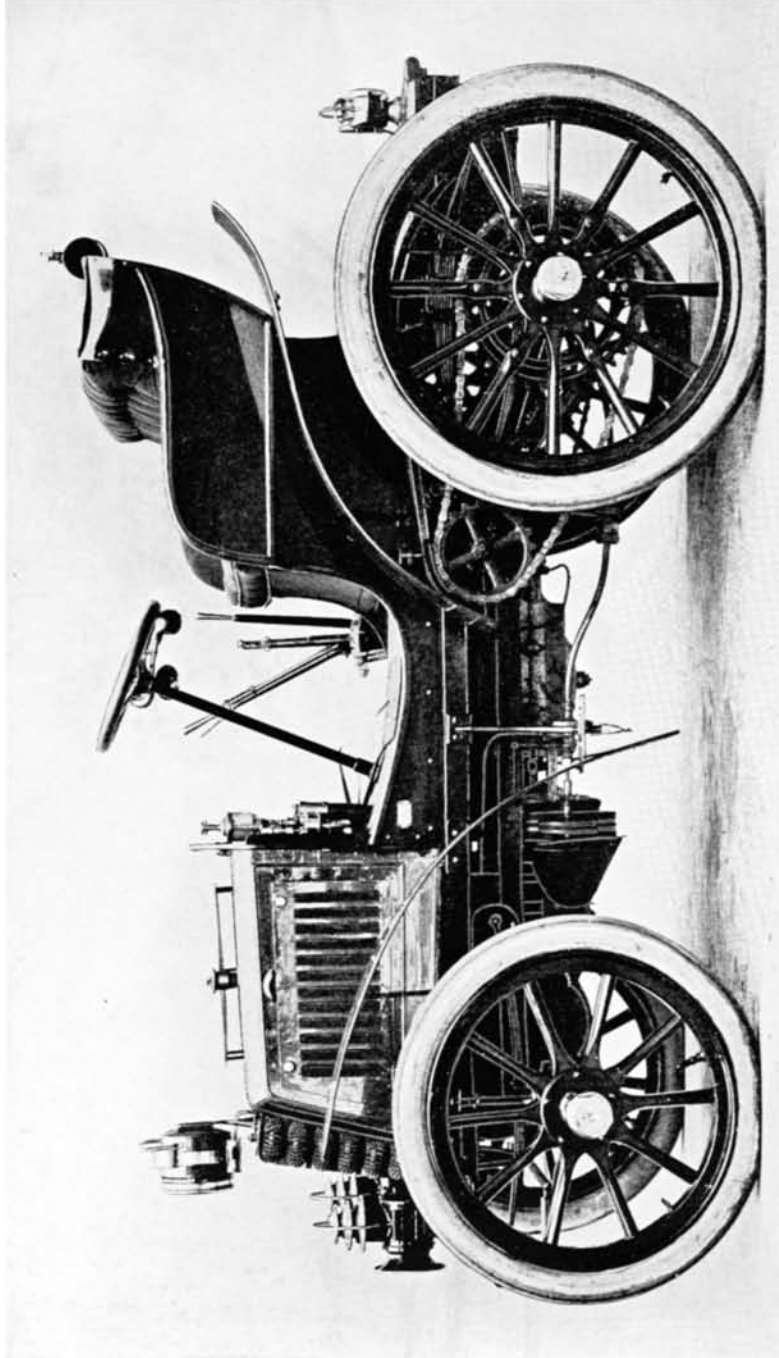
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12 HP. PANHARD & LEVASSOR DAIMLER MOTOR CARRIAGE. (See pp. 140, 380.)

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MOTOR VEHICLES AND MOTORS

THEIR DESIGN CONSTRUCTION AND
WORKING BY STEAM OIL
AND ELECTRICITY

BY W. WORBY BEAUMONT

*Mem. Inst. Civil Engineers, Member of the Inst.
Mechanical Engineers, and Member of
the Inst. Electrical Engineers*

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BUTLER & TANNER,
THE SELWOOD PRINTING WORKS,
FROME, AND LONDON.

PREFACE

THE object of this book is to put its readers into possession of an accurate and critical account of modern forms of mechanically-propelled road vehicles of various kinds, and to give as many illustrations and descriptions as may be necessary to represent the chief types of motors and vehicles of the ninety-ninth year of the nineteenth century.

**Objects and
scope of
book and
illustrations**

The history of efforts in the past to produce satisfactory self-moving vehicles is also so far treated as is necessary,—by drawings, descriptions and statistics,—to show what was accomplished or designed, and may be now usefully imitated or avoided.

It is intended, firstly, to be a book that shall be useful to engineers and motor vehicle constructors; and secondly, that those who take an intelligent interest in the construction and working of motor vehicles shall find in it more definite information, description, and explanation than has yet been placed before them on these subjects.

Nearly all the drawings have been made in the office of the author specially for this book, and now appear for the first time. Only two sets of the many herein published have been provided as they now appear, and it is claimed that the completeness of the drawings here given, showing not only disconnected details but everything in its place, makes them unique. Moreover, it may be mentioned that nearly all the line engravings herein appearing, having been produced from drawings specially made, will bear inspection with a magnifying glass; and in a few examples, such as Fig. 57, which show so much crowded into a small space, this may be necessary, but every detail and connection will, I believe, be found complete.

PREFACE

**Rapid
progress
since 1896**

Progress is now so rapid in the development of the various mechanical constituents of motor vehicles, more especially of those propelled by petroleum spirit motors, that even before the appearance of this book, some important details not included in the descriptions may appear. Sufficient experience has, however, already accumulated to show that the types of vehicles now most prominent are likely for a considerable time to be, in principle, and in the main features, those chiefly followed.

**The motor
vehicle
a difficult
mechanical
problem**

It may be safely said that the mechanically-propelled road carriage, which shall satisfy the requirements of a vehicle intended to take the place of a horse-hauled vehicle, offers to mechanical engineers and carriage builders one of the most difficult and comprehensive problems ever placed before them. This is in great measure an explanation of the seeming slowness with which the motor carriage is taking the place it is destined to occupy.

**Legal
restriction
and want of
experimental
experience in
England**

It must be remembered, however, that it was not until the end of 1896 that the designer and maker of a mechanically-propelled road carriage was permitted under the laws of the United Kingdom to make any road trials. Without such trials neither the experience nor the knowledge necessary to successful construction could be obtained.

**Foreign
freedom of
use of
roads and
activity**

Hence, although England is the true home of the motor vehicle, the constructors of other countries, particularly France and Germany, not fettered by such restrictions on the enterprise of the men who benefit their country by originating industrial enterprise, have had the honour of making their country the home of the modern motor vehicle.

In Great Britain are many thousands of miles of good high-roads, almost as good as an equal number of miles of the main roads of France, but our friends across the Channel are now making a dozen vehicles to England's one. In America, a great home of masters in practical mechanical engineering, there is not one mile of good road to our one hundred, and most of their street paving is so bad, or so spoilt by street railways, that trouble was the most certain reward of any attempts to use mechanical road carriages. Road construction is now, however, a subject of practical attention in the States, and this fact, and the potent fact of a probable market in Europe, is stirring

PREFACE

the severely practical American combination of mechanic and business man to that activity which will ere long put excellent American motor carriages of consolidated patterns on European roads.

British engineers and manufacturers are, however, now beginning to realise that, strange as it may seem, they are free to run motor carriages on British roads more or less free of Bumbledom, and the progress they have made in the three years of their emancipation has already shown itself in the practical results of many excellent vehicles and in the employment of some thousands of people.

Many, however, of those who are at work on the mechanical road vehicle are insufficiently acquainted with what has already been done by those who are far on the road to success, and they are in consequence repeating old designs and old experiments, only to arrive at similar conclusions and disappointments. To these, as well as to the users, or would-be users, of motor carriages, it is hoped that this book will be of service.

**Lessons
from past
achievements**

Cheap or rapid or convenient road transport for man and goods is one of the most important of all contributions to national comfort and prosperity. For those who by ingenuity, diligence, much patience and much expense, provide this means of transport there should be no ungrudging reward. Unfortunately, there are no adequate means of securing this reward; for the end of years of work, though crowned with practical success, may leave the persevering worker in possession of a successful vehicle very little of which is protected under the Patent laws. That which is the most difficult to achieve may, after many trials, and many tons of scrap, which has cost much of several lives and almost its weight in gold, be achieved in the end by what may seem simple means. For this reason a knowledge of those things which have been the subject of past invention and of patents is of importance to those working in this field, and it is hoped that this book will provide much of that information.

**Importance
of quick
and cheap
transport**

**Protection
of invention
in motor
vehicle
design**

I wish here to acknowledge my indebtedness to several of those whose vehicles and motors are herein illustrated for permission to make sketches from their vehicles, and to others for tracings and photographs, from which suitable drawings have been made for reproduction here.

I would especially record the valuable aid I have received from my

PREFACE

assistant, Mr. C. R. D'Esterre, by whom many of the drawings herein given have been made entirely from measurement sketches of vehicles and their motors and gearing, and also for his assistance in the preparation of the chapter on electrical ignition apparatus. In respect of several vehicles drawings sufficient for the intended completeness of engravings for this book were not forthcoming from the makers. From sketches of the vehicles, their engines or motors and mechanism taken to pieces for the purpose, with permission of their owners, many of the working drawings herein have been made, and in this respect I have to thank Mr. F. H. Butler, the Hon. Mr. C. S. Rolls, Major Holden, Mr. H. Hewetson, Mr. A. F. Mulliner, Messrs. Brown Bros., Dr. E. E. Lewhess, Mr. S. F. Edge, Mr. H. A. House, Jun., Mr. W. C. Bersey, Mr. H. N. Searle, Mr. R. M. Ford, and Mr. F. R. Simms, and several whose names occur in connection with the vehicles illustrated.

The chapters originally intended to be written by Mr. Dugald Clerk, on the physics and economics of internal combustion motors, and a descriptive index to patents relating to motor vehicles, having been unavoidably delayed, will appear shortly as a separate volume.

W. W. B.

OUTER TEMPLE, LONDON,
March, 1900.

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