

# Preface

Machines have always gone hand-in-hand with the cultural development of mankind throughout time. A book on the history of machines is nothing more than a specific way of bringing light to human events as a whole in order to highlight some significant milestones in the progress of knowledge by a complementary perspective into a general historical overview.

This book is the result of common efforts and interests by several scholars, teachers, and students on subjects that are connected with the theory of machines and mechanisms. In fact, in this book there is a certain teaching aim in addition to a general historical view that is more addressed to the achievements by “homo faber” than to those by “homo sapiens”, since the proposed history survey has been developed with an engineering approach.

The brevity of the text added to the fact that the authors are probably not competent to tackle historical studies with the necessary rigor, means the content of the book is inevitably incomplete, but it nevertheless attempts to fulfil three basic aims:

First, it is hoped that this book may provide a stimulus to promote interest in the study of technical history within a mechanical engineering context. Few are the countries where anything significant is done in this area, which means there is a general lack of knowledge of this common cultural heritage. IFToMM, the International Federation for the Promotion of Mechanism and Machine Science (MMS), which has also collaborated in producing this book, is carrying out an important labour in this respect through the Permanent Commission on History of MMS, but more engineers need to be involved in historical studies. In addition, knowledge of the historical-technical developments of machines and mechanisms will lead to greater motivation to currently increase the efforts that are needed to obtain results that are useful for advancing technology and hence for society. The Hispanic cultural area is perhaps an example of this type of relative deprivation, particularly when compared with the English-speaking world. The Spanish Association of Mechanical Engineering (AEIM) starting from its former president Vicente Díaz, which has also collaborated in this book, is determined to promote this task in its sphere of influence. Not only the language of this book but also its general structure, with emphasis on the graphical descriptions, are aimed at attracting generations of mechanical engineering students to this field, who could use similar books as textbooks for optional subjects in their more completed technical formation.

A second aim is to pay a debt of gratitude to the often anonymous personalities, who throughout history have turned their ingenuity to the construction of mechanical systems that have contributed to the development of mankind. Indebtedness is also directed towards those who reflected on the fundamentals of machine designs and constructions to open up new horizons to civilisation. These men undoubtedly contributed more to mankind than many others whose names fill the pages of universal history, being they politicians, military men, or scientists. However, these men remain practically unknown. Remembering them is not only an act of justice; it is also, and maybe above all, the way to reveal a vital path to new generations of mechanical engineers and a stimulus to follow their example, with the pride of belonging to a tradition that is of unquestionable historical importance.

The final aim of this book is to stimulate a multidisciplinary thinking to fertilise the advance of knowledge with contributions from the different branches of human wisdom. There are too many stimuli in the present-day world that tend to pigeon-hole the individual into ever more specialised fields and are therefore lacking in global vision. Mechanical engineering is also open to this risk and any attempt to open up new horizons will be more than welcome.

These ambitions are undoubtedly too many for such a small book, but they may give some idea of the enthusiasm that went into writing it.

Knowing their own history always strengthens a group's signs of identity. Building machinery and reflecting on the way it works has a long tradition in the past that continues with vigour in the present. Knowing the roots lends perspective to future actions by endowing them with a collective, continuous sense of development. If this book contributes to promoting this feeling, all the efforts will have been worthwhile.

This book would not have been possible without the help and support of many people. Those "authors in the shadows" have contributed ideas, images, and advice, which in one way or another, have led to the book's completion. Among the many names that should be mentioned are those colleagues from the Machine Engineering Division at Madrid Technical University (Pilar Lafont Morgado, Pilar Leal Wiña, Andrés Díaz Lantada, Héctor Lorenzo Yustos, Julio Muñoz García, and Juan Manuel Muñoz Guijosa) together with some other teachers and friends from other Spanish schools of engineering such as Felipe Montoya from University of Valladolid and even students as Raquel Bernardos. We should also like to thank Justo Nieto whose financial support through the "Foundation of the Valencian International University" has enabled the book to be published in a preliminary Spanish edition. The authors are also grateful to many colleagues within the IFToMM Permanent Commission on History of MMS who have helped them with comments and discussions during the last decade to become conscious that technical aspects of historical developments are worthwhile also for technical background and formation. Among the many colleagues from all around the world, the authors like to express gratitude to the last Chairmen of the Permanent Commission: Prof Teun Koetsier (from Amsterdam University), Prof Hong-Sen Yan (from Tainan University), and Prof Hanfried Kerle (from the Technical University of Braunschweig).

Apart from our gratitude to the persons closest to us, we must not forget that the pages of this book are full of machines and mechanisms that were thought out and drawn by brilliant minds that existed in the past, and without which there would be no *raison d'être*. The authors owe a debt of gratitude to all of them.

The Spanish authors would like to pay tribute to the memory of Professor Ignacio Medina. He was a fine example of the many people who have devoted their lives to science and the theory of machines and mechanisms. His teachings motivated both students and teachers in their study of this science. The figure in the cover represents a mechanism design for a pumping system by Francesco di Giorgio, as an example how an illustrated design can give a strong relevance of machine capabilities.

Finally, the authors are gratefully to their families whose patience and comprehension have permitted them to spend time and efforts on elaborating and completing this book.

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