

**CHANGE GEAR DEVICES.
SHOWING THE DEVELOPMENT OF
THE SCREW CUTTING LATHE AND
THE METHODS OF OBTAINING
VARIOUS PITCHES OF THREADS**

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OSCAR E. PERRIGO

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Señor E. Ferrero

Change Gear Devices

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Oscar E. Perrigo

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by

Oscar E. Ferrigo

Preface

Some time ago the author had occasion to make a more or less exhaustive examination of the subject of Change Gears for engine lathes, and the development of the devices for this purpose as represented by the existing patents which have been granted for the same. The search was one of long and arduous study and labor, and the subject seemed to possess sufficient interest to legal and mechanical men to warrant the publication of the results in such a permanent form that it might be preserved as a convenient and concise book of reference on this subject.

Most of the matter has been published in the columns of "Machinery," and has received the kind commendation of many thoughtful men.

There were one hundred and sixty-four patents examined, and out of this mass, twenty-nine were selected as bearing directly upon the Change Gear problem; the others being for forms of variable speed devices and similar inventions, not properly coming under the head of the Evolution of the Change Gear.

These twenty-nine patents have been very carefully considered and described, their special or distinguishing features illustrated and compared in a conscientious and disinterested manner, which it is hoped, will prove both instructive and useful to those who may be interested in this field of mechanical development.

OSCAR E. PERRIGO.

New Haven, Conn., September, 1903.

Introduction

The question of the change gears for lathes and the great amount of time and inventive genius that has been devoted to the matter in the last few years would seem to render the subject one of considerable interest to the men who design lathes, the manufacturers who build them, the men who buy or use them, and the men who are interested in the obtaining of patents upon their various and almost multitudinous devices.

The matter has been taken up with the view to ascertaining what there may be in this line which has been secured in the United States Patent Office; to give diagram illustrations of the prominent features of each device in itself, and to compare and contrast its various claims to usefulness, both in a commercial and in a practical way, with other inventions of its class.

It is undoubtedly true that there may be very commendable devices on the market to-day, put forth on a quasi claim of being patented, which have never seen the inside of the Patent Office, except possibly to be put on the immense list of rejected applications.

The careful and methodical reader is assured that although the copies of no less than one hundred and sixty-four patents have been considered, covering as they do many phases of variable speed mechanism, the twenty-nine patents hereinafter described and illustrated contain all of the subject matter from the patent of Bancroft and Sellers in 1854 to that of Newton, May 19, 1903.

And in reviewing these various patents the first

Honor where honor is due.

consideration has been to get at the *germ* of the invention, to illustrate its good points "for all they are worth," and in comparison with others to give all due credit which the mechanical knowledge of the writer feels to be fair and just. If inventors feel their devices are underrated they are heartily assured that there is no desire to in any way belittle their work, but rather to bestow "honor where honor is due."

It would seem appropriate just here to mention some of the points which impressed themselves on the mind of the writer during the long and careful consideration of this subject. Of course it is expected that there will be those who will not agree with the writer's opinions or deductions as to the construction or merit of the various inventions. To these good people there is one thing to be said. It is this. It is a most difficult undertaking to describe and analyze this number of patents, representing, in some cases, ideas so nearly similar as to be very difficult to decide their respective merits or similarities, or again, the subject of antagonistic interests, each supposed by their partisans to embody the only proper construction.

In all these perplexities, however thorough and painstaking a writer may desire to be in his work, and however anxious he may be to do exact justice to all, "it is impossible to suit everyone," and consequently that effort was discarded in the beginning.

One of the features in patent drawing which strikes a practical mechanic very forcibly is that very few of the drawings are so made that even an operative model could be made from them, much less a practical working machine, without supplying much in the way of mechanical detail and design.

Various views and groups of parts are found utterly