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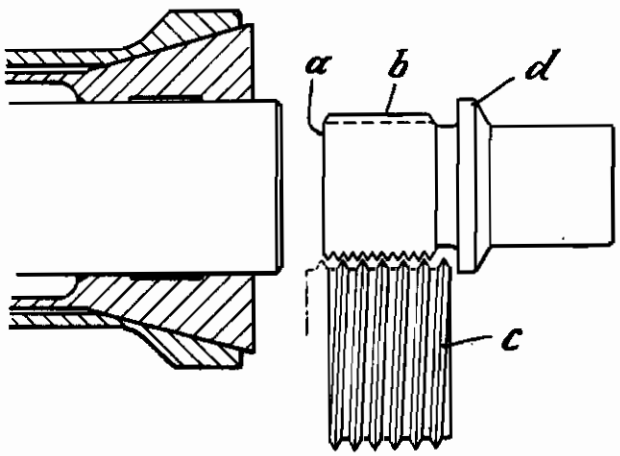

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METHOD AND TOOL FOR CUTTING THREADS

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This invention relates to a novel method and a new tool for cutting threads.

The known methods and appliances for cutting threads, for example, on a lathe, includes a cutting die for outside threads and a tap for cutting inside threads. The milling or grinding of threads is usually carried out in separate operations on special machines. The die and tap tools have limitations regarding costs and accuracy, particularly in the case of threads of relatively large diameter, and their use is further limited by the shape of the work piece on which the thread is to be cut. For example, a die cannot be successfully used in the case of a work piece having a flange or other enlargement disposed adjacent the thread portion. It is necessary in such cases to resort to the use of special thread cutters, even where the relatively high accuracy, which can be obtained with such cutters, for example, with single tooth cutters or the like, is not required. The disadvantage of such thread cutters resides in the time factor: more time is required to provide a thread with a thread cutter than with the other customary tools.

One of the objects of the present invention is to provide a new thread cutter and a method for cutting threads therewith in a considerably shorter time than was possible heretofore and with a higher degree of accuracy than can be obtained by using dies or taps of known structures.

The drawings illustrate an embodiment of the invention.

Reference character *a* indicates a work piece provided with an enlargement or flange *d* which excludes the efficient use of an ordinary die or the like for cutting a thread on the section *b*. The thread may be cut with the new thread cutter c to obtain the previously mentioned advantages.

The new thread cutter *c* may be made in the form of a round formed tooth provided with a plurality of cutting teeth which are axially spaced from each other in the illustrated embodiment by twice the pitch of the thread to be cut. This spacing, however, is not to be considered as an absolute rule; different spacing of the teeth may be adopted.

The cutting procedure may be generally similar to the one used with known thread cutters; that is, the cutter is successively adjusted so as to cut to a certain depth and is repeatedly carried after each depth adjustment lengthwise of the thread portion *b* until the desired thread is finished.

The known thread cutter having one or several teeth and operating according to this general procedure requires to be carried over the entire length of the thread, the first tooth taking care of the precutting and the other teeth successively finishing the thread, thus necessitating an axial path relative to the work piece which exceeds the length of the thread. The new method and tool disclosed herein depart from this procedure. The cutting teeth are identical as to form and shape, and the tool is moved axially relative to the work piece regardless of the length of the thread over a distance which is substantially equal to or only slightly greater than the distance between its cutting teeth, which may be the space corresponding to the distance determined by the pitch of the thread or any desired multiple thereof.

The cutting path of the tool becomes smaller with the increase in the number of its cutting teeth provided on a cutter of a given width. In the illustrated example showing a thread cutter with teeth spaced by twice the pitch of the thread, the cutter will move axially relative to the work piece over a distance slightly exceeding double the space of the pitch. Accordingly, the work piece must rotate slightly more than through two revolutions in order to cut the required thread. The initial position of the cutter is fragmentarily indicated in dotted lines and its end position in full lines. The resulting space indicates the relative axial operating motion which is substantially equal to the distance between the teeth of the cutter. The shortest cutting time is reached, provided the thread is not prohibitively long, by using a thread cutter made according to this invention and providing thereon teeth spaced by a distance substantially equal to the pitch of the thread. Each tooth will then cut only part of the thread, or a distance which is substantially equal to the pitch of the thread, and the work piece has to go only through a little more than a single revolution.

In this new method using, for example, a tool with a width which corresponds substantially to the length of the thread, the cutting path is wholly independent of the length of the thread and is, in the illustrated embodiment, only slightly greater than the distance between two cutting teeth. According to the cutting of the thread and the division or distribution of its teeth, one-third, one-half or all of the threads are cut simultaneously, rendering a very economical and efficient procedure.

The drawings illustrate particularly the cutting of outside threads. It will be understood, however, that the principles discussed are likewise applicable to cutting inside threads by means of a tool conforming in structure and use to the one which is specifically described and illustrated herein.

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