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O. W. BERG

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METHOD OF MAKING THREAD CUTTING DIES

Filed July 21, 1928

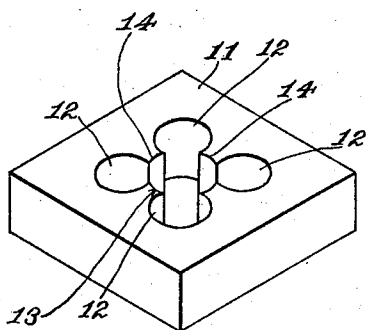


Fig. 1.

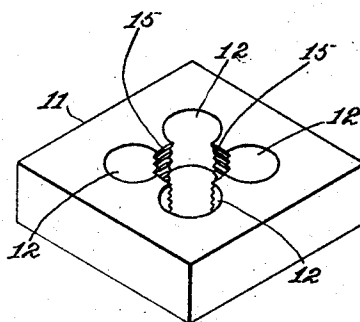


Fig. 2.

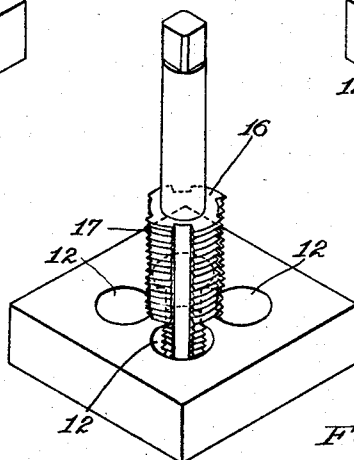


Fig. 3.

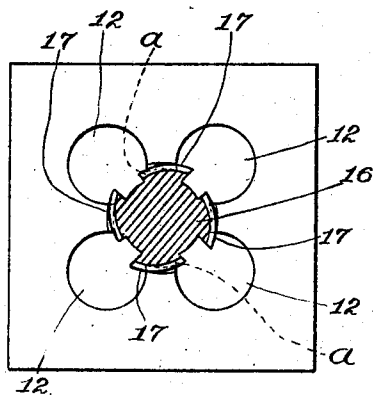


Fig. 4.

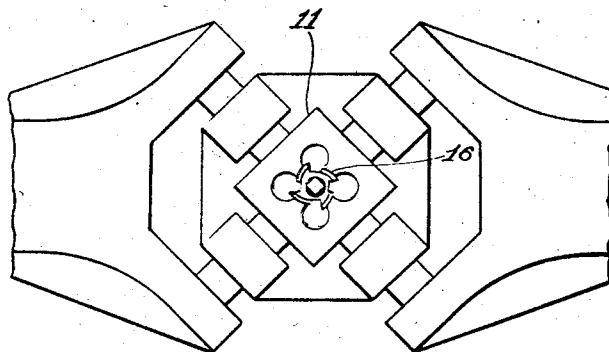


Fig. 5.

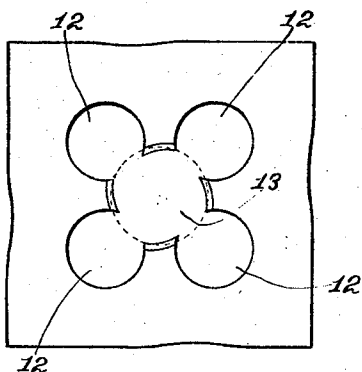


Fig. 6.

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UNITED STATES PATENT OFFICE

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METHOD OF MAKING THREAD-CUTTING DIES

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My invention relates to a solid thread cutting die to be employed for cutting threads on bolts, pipe and the like. As is well understood by those skilled in the art thread cutting dies have heretofore been made in two forms, either solid dies or dies with separate bits. The solid dies are much cheaper but it has not been possible to make them economically with the clearance for the cutting surfaces. In fact, it has been very difficult if not impossible to produce solid cutting dies smaller than about $\frac{1}{2}$ " dies with a clearance. My present invention provides a solid thread cutting die having a clearance at the heel of the cutting surface. The dies embodying my invention, therefore, have the chief advantages of the dies with loose cutters but can be made in accordance with my novel method hereindescribed much more cheaply.

The invention will be fully understood from the following description when taken in connection with the accompanying drawings and the novel features thereof will be clearly pointed out and defined in the claim at the close of this specification.

In the drawings:

Fig. 1 is a view in perspective of a blank.

Fig. 2 shows the blank with the preliminary threading.

Fig. 3 shows the blank with a master tap in place.

Fig. 4 is a horizontal section of the master tap and blank shown in Fig. 3.

Fig. 5 shows the blank being compressed onto the master tap.

Fig. 6 shows the completed cutter.

Referring to the drawings, I first prepare a blank 11 as shown in Fig. 1. This blank has four holes 12 drilled around and communicating with a central hole 13 to provide four lands 14 between the holes 12. The blank as thus prepared is tapped out in the ordinary manner to provide screw thread edges 15 as shown in Fig. 2. These edges 15 form arcs of a circle having the axis of the cutter as a center. Up to this point the procedure is the same as has heretofore been practiced in making ordinary solid cutters. If the cutter is hardened in this form no clearance is provided between the heel of each land

and the work. If clearance is not provided the friction of the land on the work prevents satisfactory operation of such tools.

To obviate this difficulty I provide a hardened master form 16 having spaced projecting portions 17 shaped complementary to the shape of the lands of the cutter to be produced, that is, having edges which incline or taper away from a circle having the axis of the form as a center. I then place this master form in position in the central hole 13 with the projecting portions opposite the lands within the central hole of the blank as shown in Figs. 3, 4 and 5. The relation of the parts at this time will be clearly seen from Fig. 4 where the clearance between the land 14 and the corresponding portion of the master form is indicated by *a*. The blank and the master form while thus relatively positioned are placed in a press indicated diagrammatically in Fig. 5 and pressure applied simultaneously to all four sides of the blank. This pressure is great enough to cause the metal to flow and to fill the spaces *a* between the ends of the lands and the sides of the master form. This gives to the lands the shape determined by the shape of the master form. This shape is clearly seen in Fig. 6 where it will be seen that each of the lands 14 has a clearance between the leading or cutting edge of the land and the heel or rear edge thereof. The master form is then removed and the cutter suitably hardened. The invention makes it possible to produce a solid cutter having the advantages of the loose or separate bit cutter at an expense only slightly greater than that of the ordinary solid cutter.

It is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practised or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation, and it is not intended to limit the invention beyond the terms of the claim hereto appended as considered in

view of the prior art and the requirements thereof.

What I claim is:

5 The method of making a thread cutting die which comprises preparing a blank having lands within a central hole, threading said lands, inserting therein a master form having a shape complementary to the shape of the cutter to be produced, compressing the
10 blank to cause the lands to take shape complementary to the shape of the master form, removing the form, and hardening the shaped blank.

In testimony whereof I affix my signature.

15 OSCAR W. BERG.

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