Feb. 9, 1932. L. W. GATES 1,843,950

THREADING DIE

Filed May 5, 1928

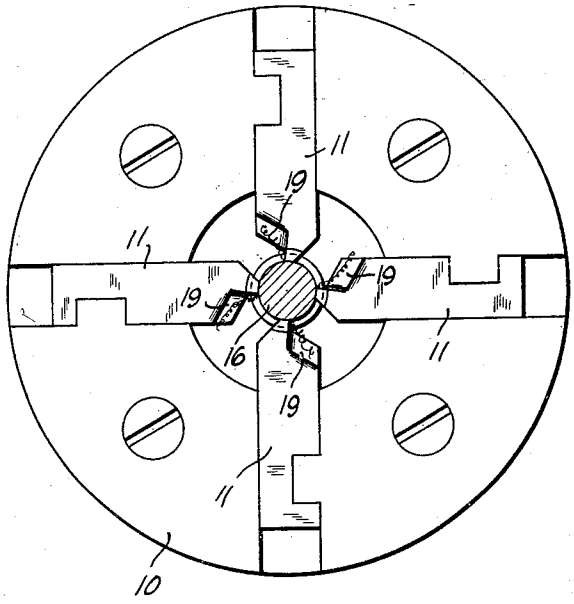


Fig. 1.

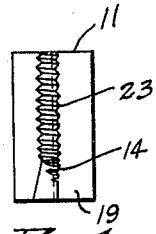


Fig. 4.

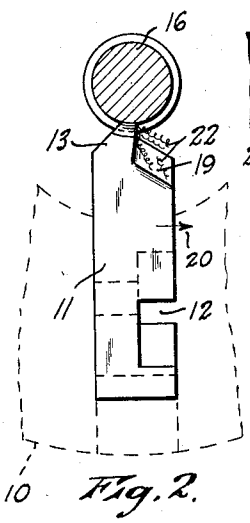


Fig. 2.

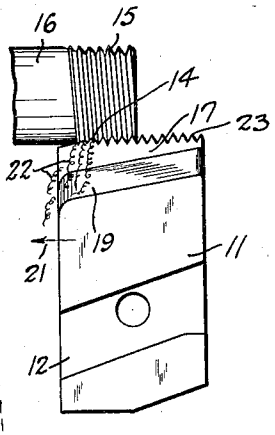


Fig. 3.

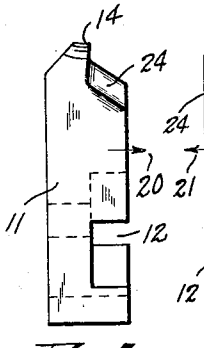


Fig. 5.

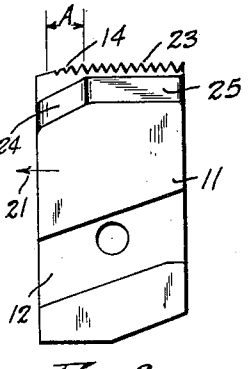


Fig. 6.

Inventor

Louis W. Gates

By Wooster & Davis

Attorneys

Patented Feb. 9, 1932 1,843,950

UNITED STATES PATENT OFFICE

LOUIS W. GATES, OF NEW HAVEN, CONNECTICUT

THREADING DIE

Application filed May 5, 1928. Serial No. 275,321.

This invention relates to a threading die, such as is used for cutting a screw thread on a bolt or the like, and has for an object to provide a die which will automatically keep itself clear of the chips cut during the threading operation and thus prevent the die from clogging.

With the above and other objects in view, the invention consists in certain novel features of construction and arrangement of parts which will be more fully described in connection with the accompanying drawings. In these drawings,

Fig. 1 shows somewhat diagrammatically the front of a threading die illustrating my invention.

Fig. 2 is a front edge view of the chaser constructed according to my invention and illustrating how it works in connection with a bolt.

Fig. 3 is a front elevation thereof.

Fig. 4 is a top plan or end view of the chaser.

Fig. 5 is a front edge view similar to Fig. 2 showing a chaser of a slightly different construction, and

Fig. 6 is a front elevation of the chaser of Fig. 5.

The dies using the chasers as now ordinarily constructed very often clog with the chips which are formed when cutting the thread, and considerable difficulty is encountered in clearing out the die so that it can be used, and, of course, the die is out of commission while it is clogged and being cleared, resulting in considerable loss of time. Also a clogged die gives very poor work. One method of keeping the die fairly clear is to force oil through it to force out the chips. This, of course, involves separate mechanism and also the objection of having a stream of oil running through the die all the time.

I have constructed a form of chaser which will of itself automatically force the chips out of the die as fast as they are formed keeping the die clear at all times and thus giving better work and saving time. Referring to the construction of Figs. 1 to 4 the body of a die is shown somewhat diagrammatically at 10 carrying any desired number of chasers 11, there usually being four chasers for a die. These chasers, as shown more clearly in Figs. 2, 3 and 4, each comprise a body portion substantially rectangular in cross section having a transverse somewhat inclined channel 12 cooperating with a suitable rib in the die for holding the chaser in position. At its inner end this chaser is reduced in thickness, as shown at 13, and on the free edge thereof is provided with the cutting teeth 14 for cutting the threads 15 in the bolt 16 or similar article as the die carrying the chasers is rotated about this element in the well known manner. In the chasers as now commonly constructed the front wall 17 of this reduced portion forwardly of the cutting edge extends backwardly therefrom straight across the chaser, and is curved outwardly at its lower end. When this chaser is used in the die the chips gather in the space formed by this recess and the walls of the die and clog, the chips becoming jammed in this space causing poor work and requiring that the machine be stopped until the chips can be cleared out of the die.

To overcome these objections I have constructed the chasers as shown on the drawings, and have made the chasers so that the chips are automatically forced laterally out of the dies as fast as they are formed, and there is, therefore, no chance of their becoming jammed in the die and clogging it. In doing this I have formed immediately in front of the cutting edges 14 an inclined wall 19, and this wall is inclined forwardly and downwardly away from the cutting edge 14 and also downwardly and laterally in the direction of the feed of the chaser along the bolt during the thread cutting operation. Thus the cutting edge remains substantially parallel with the axis of the member being cut and also lies in the substantially straight plane 17 which extends substantially normal to the surface being cut. In other words the cutting edge is not changed but is the same as has been found to be the best for this type of work, and, therefore, as far as the cutting of the thread is concerned the chasers operate in the same manner as before. The improvement is in effectively and

automatically getting rid of the chips and preventing clogging of these chips, and without requiring new technique in grinding or operation of the cutting edge. The chasers are used in the same manner as the old chasers but without clogging. Therefore, the men do not have to learn the handling of new devices. It will be seen that the chip ejecting wall or surface 19 merges into the plane 17 and is inclined outwardly and forwardly therefrom, and is also inclined outwardly and forwardly toward the leading end of the cutting edge. As shown in Fig. 2, a forward movement of the die about the bolt is the direction of the arrow 20, and the feeding movement is to the left in the direction of the arrow 21, Fig. 3. It will thus be seen that the inclined wall 19 is adjacent to the cutting edge 14 and extends longitudinally thereof immediaely in front of it. It will then be clear that as the chips 22 are formed by the cutting edges 14 they are forced against the inclined surface 19 and by the camming action thereof are forced laterally or to the left, as viewed in Fig. 3, out of the die, and there is no chance of their becoming jammed in front of the chaser and clogging the die. By this arrangement the chips are automatically forced out of the die by this surface 19 as fast as they are formed.

In Figs. 5 and 6 I have shown a slightly different arrangement of this inclined surface. In Figs. 2 and 3 this inclined surface extends entirely across the chaser, but as only a relatively small portion of the cutting edge thereof is used for cutting the thread it is not necessary that this inclined wall be extended entirely across the chaser. In this type of device practically all of the work of cutting the thread is done at the space indicated at (A) between the vertical lines, Fig. 6, the remaining teeth 23 on the chaser being used to keep the work in alignment and to feed the die forwardly at the proper rate to maintain the proper pitch. I therefore, may form the chip clearing and discharging surface 24, as indicated in Figs. 5 and 6, and locate it immediately in front of the cutting portion (A) only. This surface extends longitudinally of the cutting edge the same as the surface 19 in Fig. 3, and has exactly the same function of forcing the chips laterally and outwardly from the die. This surface is inclined downwardly and forwardly from the cutting edge in the direction of movement of the chaser about the bolt and downwardly and laterally in the direction of the feeding movement of the die along the bolt being threaded, the same as in the first form. The remainder of the inclined wall, indicated at 25, Fig. 6, may be extended straight across the chaser as there is no cutting done by the teeth 23, and therefore, no chips are formed by them to clog the die.

With the chasers constructed as above described the chips are automatically forced out of the die as soon as they are formed and the die is, therefore, always kept free with no danger of being clogged by accumulation of chips in the spaces in front of the chasers.

Having thus described the nature of my invention, what I claim is:

1. A chaser for thread cutting dies comprising a body having a thread cutting means at one end comprising a substantially straight cutting edge extending substantially parallel with the axis of the member being cut and lying in a straight plane extending substantially normal to the surface being cut, and a chip ejecting wall extending forwardly from this plane outwardly of the cutting edge and inclined both forwardly away from the cutting edge to throw the chips away from this edge and laterally in a direction longitudinally of the cutting edge toward its leading end to eject the chips from the die.

2. A chaser for thread cutting dies comprising a body having a cutting edge extending substantially parallel with the axis of the member being cut and lying in a substantially straight plane substantially normal to the surface being cut, and a chip ejecting wall merging into the surface of this plane outwardly of the cutting edge, said wall being inclined outwardly and forwardly from this plane to throw the chips away from this plane and also outwardly and laterally toward the leading end of the cutting edge to eject the chips from the die.

3. A chaser for thread cutting dies comprising a body having a cutting edge extending substantially parallel with the axis of the member being cut and lying in a substantially straight plane substantially normal to the surface being cut, and a chip ejecting wall merging into the surface of this plane outwardly of the cutting edge and inclined laterally and outwardly toward the leading end of the cutting edge to throw the chips forwardly from this plane and also eject them from the die.

In testimony whereof I affix my signature.

LOUIS W. GATES.