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D. STERN

2,774,083

LOCKING MEANS FOR CAM OPERATED CHASERS

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FIG. 1.

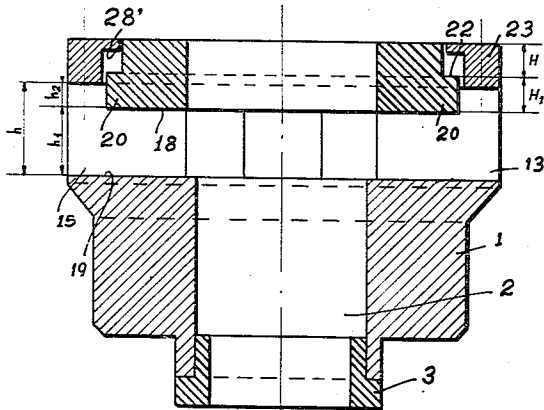


FIG. 3.

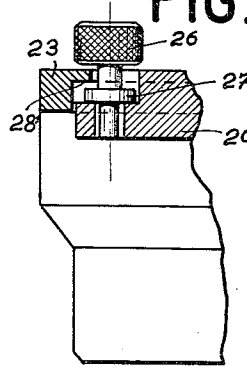


FIG. 2.

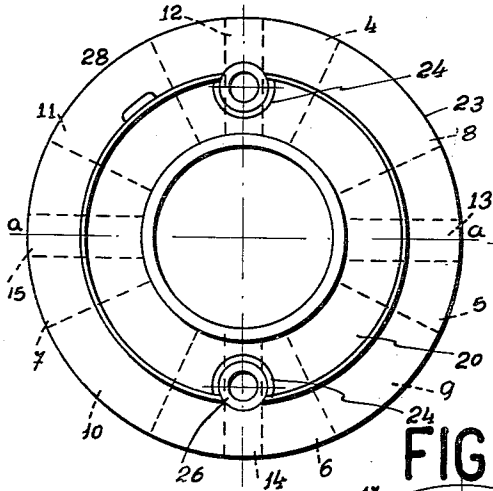


FIG. 4.

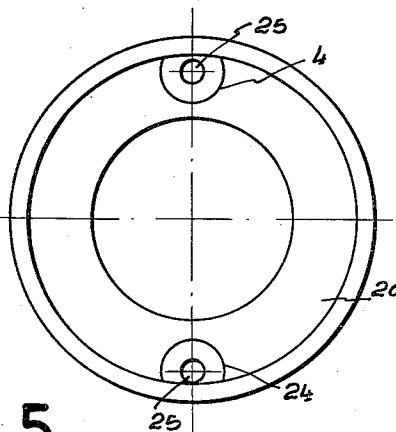


FIG. 5.

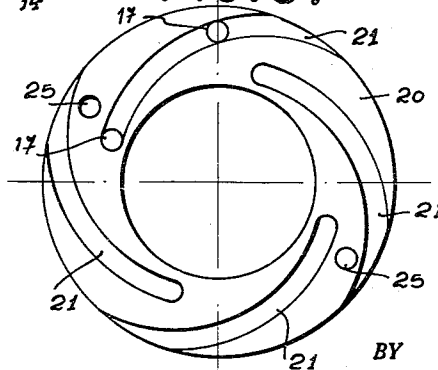
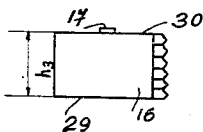


FIG. 6.



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LOCKING MEANS FOR CAM OPERATED CHASERS

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5 Claims. (Cl. 10—122)

The present invention relates to important improvements in the manufacture of screw cutting devices, mandrels and the like. The object of the present invention is to reduce the cost of such devices by simplifying and eliminating complicated parts, difficult to adjust and costly to manufacture.

A typical example is that of the ordinary taps and dies, in that the member which provides for the advancing and correct positioning of the edges that cut the thread, must be mounted with a high degree of accuracy, and with minimum tolerance, the manufacturing of which requires a work of high precision, as otherwise the cutting action is poor and the tool faulty. It is for this reason that the cost of such tools is so high.

Such condition which prevent the manufacture in a large scale at a low cost of the dies more commonly used, are practically eliminated by the improved construction of the present invention. The levelling surface of the cutting edges is held by the bottom surface of a plurality of radial cavities, and by a pressure member so that the radial cavities effected by plain milling and the knives or cutters are accurately made and the manufacture is greatly simplified, to thus make possible the offer to the buyers of an efficient, safe and durable product, easy and simple to operate and capable of making perfect screw threads.

Finally, the operation of the member pressing the cutting edges is carried out with plain screws, of special shape, which will at the same time act as resting means for the rotation of the member which causes the radial displacement of the cutting edges.

In order that the present invention may be clearly understood and readily carried into effect, same will hereafter be described with full details with reference to the accompanying illustrative drawings, wherein:

Fig. 1 is a section of a die made according to the invention, the section being effected through the line *a—*a** of Figure 2.

Fig. 2 is a front view of the improved die shown in section in Fig. 1.

Fig. 3 is a detail of the mounting of the operative screws, the outer ring and the disc that will cause the radial displacement of the cutting edges.

Fig. 4 shows as seen from its upper face, the annular turnable part that provides for the radial displacement of the cutting edges and which presses them against their seats.

Fig. 5 shows the same turnable annular part of Fig. 4, but seen from its lower face.

Fig. 6 shows a side elevation of a cutting edge of the type used in the device of the present invention.

In all the above figures the same reference numbers designate same or equivalent parts.

With reference to the drawings, the device of the present invention in its application to the making of a die comprises a body 1, of suitable shape, which is longitudinally traversed by the opening 2 which, at one of its ends, is capable of carrying mounted thereon, in some remova-

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ble manner, the cylindrical guiding member 3 intended to act as a guide for the part to be worked with the tool of the present invention. The other end of the body is formed with a plurality of segments or sections which, in the example shown, are four and are designated as 4, 5, 6, 7 (but that may be more or less as found convenient) the segments being alternately spaced with free zones 8, 9, 10, 11, and in which segments there has been milled the radial slots 12, 13, 14, 15 intended to receive and at the same time to act as a guide for the cutter 16, the cutter 16 being formed with a projection on its upper surface.

The segments of body 1 are of the height "*h*" and present a turned portion 18 embracing a thickness corresponding to the height *h*₂, so that in the turned zone reduces relative of the segments down to bottom 19 of slot *h*₁, to thus shape a shoulder.

Resting over the turned portion 18 of the segments, there is mounted, turnable, the annular body 20 which, at its lower face is provided with spiral slots 21, as many in number as there are cutters or knives, the said slots tightly lodging projections 17 of the knives. The annular body 20 presents at its upper face, the peripheral turned recess 22 extended over a height indicated in the drawing in Fig. 1 with *H*. The construction described makes possible the arrangement through suitable means (for example screws not shown) of a retaining ring 23 that is secured on the upper edge of the segments, where the height *H*₁ is larger than the height *h*₂ before mentioned.

The cutting edges will be numbered in sequence, and by the given relation existing between the projections 17 thereof and the spiral slots of the annular body 20, the radial direction of the cutting edges will take place when the annular body is angularly displaced.

For the purposes of providing such turning action or to provide for the securing of the cutting edges, the device comprises two or more recesses 24 provided in the annular body 20, such recesses being of semi-circular shape to make possible within the space comprised between the spirals, threaded holes 25. Within these threaded holes will be lodged screws 26 which are provided with the annular projection 27, and which may be introduced by making notches flush with the recess 28 of the inner edge of retaining ring 23.

The device operates in the following manner: when the screws are driven downwards, i. e. in the direction of body 1, the annular projection 27 thereof remains far from the reduced edge 28' of the retaining ring 23, and therefore, the annular member 20 may be angularly turned in either direction using for the purpose the screws as handles. The turning of said annular member makes the cutting edges related with the said member through its projections 17, to move radially in either direction according to the movement that has been given to the annular member. Once the position required of the cutting edges has been obtained, screws 26 are rotated in a reverse direction, that is, in the direction of the retaining ring, thus making the annular projection of said screws press against the reduced edge 28' of the retaining ring 23, and there will take place the displacement of the annular member 20 downwards, its turning being thereby prevented. The height of the cutter 16 from the lower edge 29 up to the upper edge 30, designated as *h*₃, should be a fraction of a mm. larger than the height *h*₁. Thus the annular member 20 will press the cutter against the bottom of the slots which lodge them, thereby securing them in the working position required.

It is to be understood that the present invention is in no way limited to the example shown and described, but that the same may have various modifications and structural changes without departing in any way from the spirit of the present invention.

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I claim:

1. A threading die comprising, in combination, support means having an axis and an end portion; at least one pair of die members slidably mounted opposite each other in said end portion on opposite sides of said axis and adjustable thereto; cam disc means mounted turnably about said axis and operatively connected to said die members to adjust their position relative to said axis during turning movement of said cam disc means, said cam disc means having a pair of parallel faces substantially normal to said axis and one of said faces being in contact with said die members; an abutment ring surrounding said cam disc means and fixedly connected to said end portion of said support means, said abutment ring having an abutting face facing the other of said faces of said cam disc means and being spaced therefrom; and a pair of locking means screwed into said cam disc means, said locking means located respectively on opposite sides of said axis, each of said locking means having a locking face facing said abutting face and located between said other face of said cam disc means and said abutting face of said abutment ring, said locking faces being movable from a first position where said locking faces are spaced from said abutting face to a second position where said locking faces are clamped against said abutting face, whereby when said locking faces are in said first position said cam disc means is freely turnable to adjust said die members and when said locking faces are in said second position said cam disc means is pressed against said die members so that said cam disc means is prevented from turning and said die members are locked in their positions.

2. A threading die comprising, in combination, support means having an axis and an end portion; at least one pair of die members slidably mounted opposite each other in said end portion on opposite sides of said axis and adjustable thereto; cam disc means mounted turnably about said axis and operatively connected to said die members to adjust their position relative to said axis during turning movement of said cam disc means, said cam disc means having a pair of parallel faces substantially normal to said axis and one of said faces being in contact with said die members; an abutment ring surrounding said cam disc means and fixedly connected to said end portion of said support means, said abutment ring having an abutting face facing the other of said faces of said cam disc means and being spaced therefrom; and a pair of locking means screwed into said cam disc means, said locking means located respectively on opposite sides of said axis, each of said locking means having a locking face facing said abutting face and located between said other face of said cam disc means and said abutting face of said abutment ring, said locking faces being movable by partly unscrewing said locking means from said cam disc means from a first position where said locking faces are spaced from said abutting face to a second position where said locking faces are clamped against said abutting face, whereby when said locking faces are in said first position said cam disc means is freely turnable to adjust said die members and when said locking faces are in said second position said cam disc means is pressed against said die members so that said cam disc means is prevented from turning and said die members are locked in their positions.

3. A threading die comprising, in combination, support means having an axis and an end portion; at least one pair of die members slidably mounted opposite each other in said end portion on opposite sides of said axis and adjustable thereto; cam disc means mounted turnably about said axis and operatively connected to said die members to adjust their position relative to said axis during turning movement of said cam disc means, said cam disc means having a pair of parallel faces substantially normal to said axis and one of said faces being in contact with said die members; an abutment ring surrounding said cam disc means and fixedly connected to said end portion of said

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support means, said abutment ring having an abutting face facing the other of said faces of said cam disc means and being spaced therefrom; and a pair of locking screws screwed into said cam disc means, said locking screws located respectively on opposite sides of said axis and parallel thereto, each of said locking screws having a flange portion located between said other face of said cam disc means and said abutting face of said abutment ring, and each of said flange portions having a locking face facing said abutting face, said locking faces being movable by partly unscrewing said locking screws from said cam disc means from a first position where said locking faces are spaced from said abutting face to a second position where said locking faces are clamped against said abutting face, whereby when said locking faces are in said first position said cam disc means is freely turnable to adjust said die members and when said locking faces are in said second position said cam disc means is pressed against said die members so that said cam disc means is prevented from turning and said die members are locked in their positions.

4. A threading die comprising, in combination, support means having an axis and an end portion; at least one pair of die members slidably mounted opposite each other in said end portion on opposite sides of said axis and adjustable thereto; cam disc means mounted turnably about said axis and operatively connected to said die members to adjust their position relative to said axis during turning movement of said cam disc means, said cam disc means having a pair of parallel faces substantially normal to said axis and one of said faces being in contact with said die members; an abutment ring surrounding said cam disc means and fixedly connected to said end portion of said support means, said abutment ring having an abutting face facing the other of said faces of said cam disc means and being spaced therefrom; and a pair of locking screws screwed into said cam disc means and located respectively on opposite sides of said axis and parallel thereto, each of said locking screws having a head portion protruding beyond said abutment ring and a flange portion located between said other face of said cam disc means and said abutting face of said abutment ring, each of said flange portions having a locking face facing said abutting face of said abutment ring, said locking faces being movable by partly unscrewing said locking screws from said cam disc means from a first position where said locking faces are spaced from said abutting face to a second position where said locking faces are clamped against said abutting face, whereby when said locking faces are in said first position said cam disc means is freely turnable to adjust said die members and when said locking faces are in said second position said cam disc means is pressed against said die members so that said cam disc means is prevented from turning and said die members are locked in their positions.

5. A threading die comprising, in combination, a tubular casing having an axis and an end portion, said end portion having an end face and being formed with at least a pair of slots extending in radial direction and respectively on opposite sides of said axis through said tubular casing; a die member slidably mounted in each of said slots and having a working face facing said axis and adjustable thereto and an end face substantially normal to said axis and projecting slightly beyond said end face of said tubular casing; cam disc means mounted turnably about said axis and operatively connected to each of said die members to adjust the position of said working face relative to said axis during the turning movement of said cam disc means, said cam disc means having a pair of parallel faces substantially normal to said axis and one of said faces being in contact with said end faces of said die members; an abutment ring surrounding said cam disc means and fixedly connected to said end portion of said tubular casing, said abutment ring having a rim portion extending transversely to said abutment ring to

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ward said axis, said rim portion having an abutting face facing the other of said faces of said cam disc means and being spaced therefrom; and a pair of locking screws screwed into said cam disc means, said locking screws located respectively on opposite sides of said axis and parallel thereto, each of said locking screws having a head portion protruding beyond said abutment ring and a flange portion located between said other face of said cam disc means and said abutting face of said rim portion of said abutment ring, each of said flange portions having a locking face facing said abutting face of said rim portion, said locking faces being movable by partly unscrewing said locking screws from said cam disc means from a first position where said locking faces are spaced from said abutting face to a second position where said locking

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faces are clamped against said abutting face, whereby when said locking faces are in said first position said cam disc means is freely turnable to adjust said die members and when said locking faces are in said second position said cam disc means is pressed against said die members so that said cam disc means is prevented from turning and said die members are locked in their positions.

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