

E. C. HENN.
DIE AND CARRIER.
APPLICATION FILED FEB. 10, 1910.

1,038,580.

Patented Sept. 17, 1912.

2 SHEETS—SHEET 1.

FIG. 1

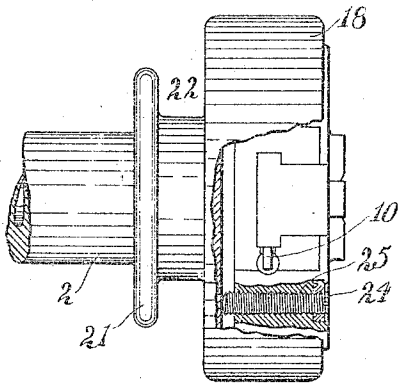


FIG. 2

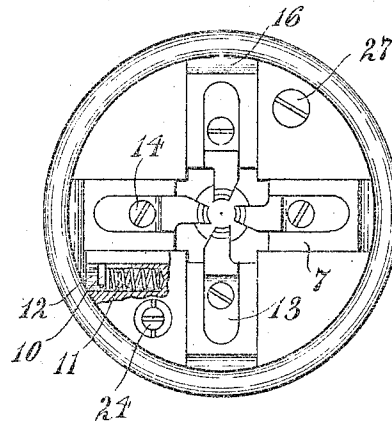


FIG. 3

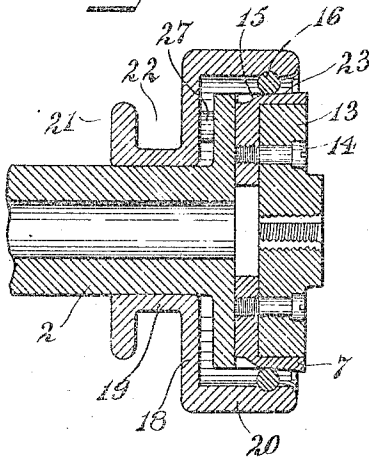
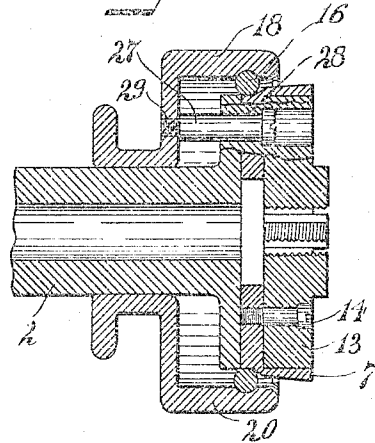


FIG. 4



Witnesses:
L. C. Badaeu.
H. D. Penney

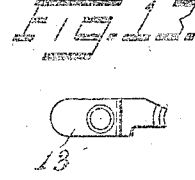
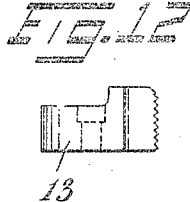
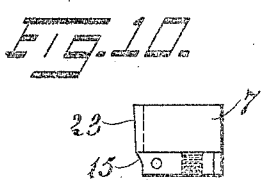
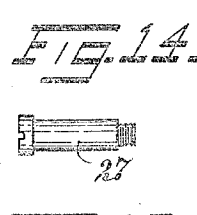
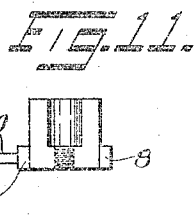
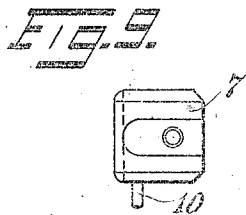
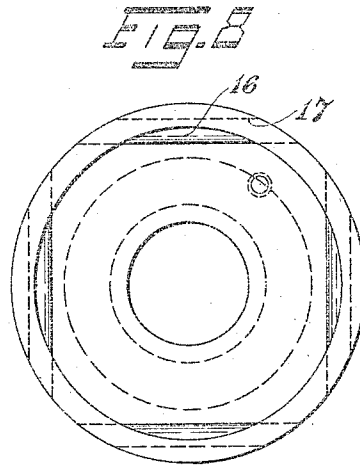
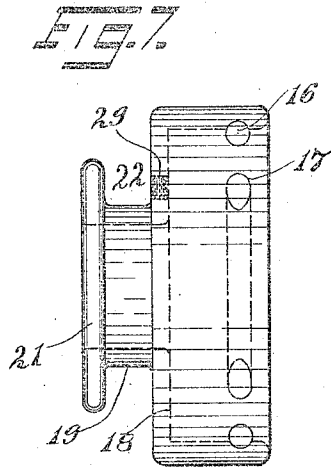
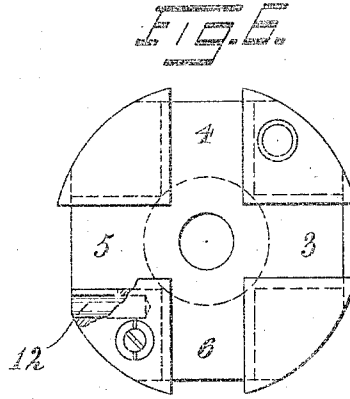
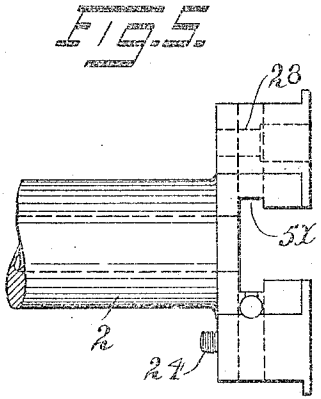
Inventor:
Edwin C. Henn,
By his Attorney, J. W. Richards.

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2 SHEETS—SHEET 2.



Witnesses:

L. D. Judeau.
H. D. Penney.

Inventor:

Edwin C. Henn,
By his Attorney, F. W. Richards.

UNITED STATES PATENT OFFICE.

EDWIN C. HENN, OF CLEVELAND, OHIO, ASSIGNOR TO THE NATIONAL ACME MANUFACTURING CO., OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

DIE AND CARRIER.

1,038,560.

Specification of Letters Patent.

Patented Sept. 17, 1912.

Application filed February 10, 1910. Serial No. 543,023.

To all whom it may concern:

Be it known that I, EDWIN C. HENN, a citizen of the United States, residing in Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Dies and Carriers, of which the following is a specification.

This invention relates to threading dies of the character known as opening, or self-opening, dies and has for its object to provide a tool of this character which will be simple in construction and can be easily operated; and at the same time can be readily adjusted to take up for wear and to change the diameter of the thread cut.

In the accompanying drawings showing one embodiment of my invention, Figure 1 shows the die in side elevation, partly broken away. Fig. 2 is an end elevation, partly broken away. Fig. 3 is a vertical section. Fig. 4 is a view similar to Fig. 3 with the chasers in the open position. Fig. 5 shows separately the die body. Fig. 6 is an end view of the die-body, partly broken away. Fig. 7 is a side elevation of the head alone. Fig. 8 is an end elevation of the head. Figs. 9, 10 and 11 show the carrier for the die-chasers. Figs. 12 and 13 show one of the die-chasers; and Fig. 14 shows a form of stop screw.

The device is shown as comprising a die-body 2 having four guides or ways 3, 4, 5 and 6 extending radially of the die-body. The rear portions of these ways are undercut, as shown at 5* in Fig. 5. In these ways slide carriers 7, shown in Figs. 9-11, having extensions 8 and 9, which slide in the recess portions 5* for retaining the carriers in the ways. Each of these slides has a projecting pin 10, which engages a coil spring 11 placed in a bore 12 in the die-body. These springs tend to shift the carriers outwardly from the axis of the body. In each of these carriers is secured a chaser 13 that may be secured therein by a screw 14.

Means are provided for causing the die-chasers and carriers to simultaneously advance toward the center or axis of the die, which will compress the springs. The compressed springs will react upon the die when the advancing means are withdrawn. The die carriers are shown each provided with a cam surface 15 at its outer portion. Four cam surfaces are provided, such as pins 16

secured in suitable bores 17, in the head member denoted generally by 18. The head-member comprises a sleeve 19 having a shell 20 inclosing the die-body and chasers; and also a flange 21 forming an annular groove 22 for engagement with a suitable operating device to shift the head axially on the die-body. The springs 11 will press the die-chasers and their carriers outwardly and cause engagement of the cooperating cam surfaces, as indicated in Fig. 4 in which the chasers are in open position. Upon the head being moved forwardly or toward the chasers, the pins 16 engaging the cam surfaces 15 will press the dies simultaneously inwardly toward the center or axis of the die, and bring them to their closed position, see Fig. 3, wherein the pins engage a flat portion 23 of the carriers for the chasers. In this position the chasers will be held in their closed position. Upon the head being drawn rearwardly, the springs will press the carriers outwardly and the cam surface 15 will permit the chasers to return to the open position.

Adjustable means are preferably provided for limiting the inward movement of the die-chasers and carriers, which is effected by having a screw 24 working in a threaded bore 25 in the die body, its inner end abutting the shell 20 of the head and limiting the closing movement of the die body and head. The face 23 of the carrier engaged by the cam 16 is preferably made on a slight taper whereby a fine adjustment of the position of the chaser when closed can be produced. Means are also preferably provided for limiting the opening movement of the head and die-body. A bolt 27 passes through a bore 28 in the die-body and is seated in a threaded hole 29 in the head. The head of the screw engaging a counter-sunk portion of the bore will limit the separating movement of the head and die-body.

By forming the cams as pins they can, in case of wear, be quickly and easily removed and replaced without interfering with the other mechanism of the die, and this cannot be as readily or as quickly done with other forms of dies. Not only this, but it is a very simple operation to insert these cam pins in their proper position during the manufacture of the cam cap, thus obviating the necessity of constructing the cam cap and cams in one piece, which would

make it much more difficult to manufacture and require the hardening of the entire cap in order to harden the cam surface points of contact, and after hardening it would be necessary to grind all of the parts of the cam cap, which is a very difficult operation, and if one or more of such points of contact became worn there would be no alternative but to make an entirely new cam cap. Therefore, by using cam pins the structure is very much more simple and such worn cam members can be more readily and quickly replaced, so that the cost of manufacture and assembling of the die is very much lessened and the structure can be readily cleaned and re-assembled in a few minutes as compared with several hours usually heretofore necessary in the cleaning and re-assembling of dies of this general character.

Having thus described my invention, I claim:

1. The combination of a die-body having a rearwardly extending shank and provided with undercut ways, members provided with thread-cutting means and having lateral extensions projecting into said undercut ways and movable radially of the body, a head slidable on said shank and having a shell encircling substantially the whole of said body, said members and head each having one a tapered surface and the other a surface cooperating therewith to move said members inwardly, springs located at the sides of the ways for moving said members outwardly, and means extending through the body from front to rear thereof and in engagement with rear of the shell for limiting the movement of said slidable head.

2. The combination of a die-body provided with undercut ways and having a rearwardly extending shank, members provided with thread-cutting means and having lateral extensions projecting into said undercut ways and movable radially in said body and each provided at its side with a projection, a spring carried by the body at one side of each way for engaging said projection to move the thread-cutting members outwardly from the center, each of said members having a tapered surface, a sliding shell encircling substantially the whole of said body and having surfaces on the inner side thereof cooperating with the tapered surfaces of said members for moving the members inwardly against the action of the springs and independent means extending through the body from front to rear thereof for limiting respectively the forward and rearward movements of said slidable head.

3. The combination of a die-body provided with undercut ways and having a rearwardly extending shank, members pro-

vided with thread-cutting means and having lateral extensions projecting into said undercut ways and movable radially in said body and each provided at its side with a projection, a spring carried by the body at one side of each way for engaging said projection to move the thread-cutting members outwardly from the center, each of said members having a tapered surface, a sliding shell encircling substantially the whole of said body and having round cams carried by and projecting transversely of the axis of the shell for cooperating with the tapered surfaces of said members for moving the members inwardly against the action of the springs and independent means extending through the body from front to rear thereof for limiting respectively the forward and rearward movements of said slidable head.

4. The combination of a die body provided with radially disposed ways, members provided with thread-cutting means movable in said ways, a head slidable longitudinally on the die body, springs for moving the said members outwardly from the center, cam surfaces between the head and said members for moving the members inwardly upon relative sliding movement of the head and die body, a screw adjustable in the die body and arranged to engage the head to limit the movement of the head on the die body in one direction, and a screw passing through an aperture in the die body and secured in the head for limiting the movement of the members in the opposite direction.

5. The combination of a die body provided with ways, members provided with thread-cutting means slidable in the ways toward and from the center, a head slidable on the die body and inclosing said members, said members being provided with tapered portions and the head being provided with cams cooperating upon the relative sliding movement of the head and die body, springs for pressing said members outwardly to retain said cams and tapered surfaces in engagement, the die body having a threaded bore, a screw operating in said bore for engaging the head and limiting the movement of the head and die body in one direction, the die body having a bore therethrough, and a bolt passing through said bore and secured in the head for limiting the separating movement of the die body and head.

6. The combination of a die-body having a rearwardly extending shank and provided with undercut ways, members provided with thread-cutting means and having lateral extensions projecting into said undercut ways and movable radially of the body, a head slidable on said shank and having a shell encircling substantially the whole of

said body, said members and head having one a tapered surface and the other a surface coöperating therewith to move the said members inwardly, springs located at the sides of the ways for moving said members outwardly, and an adjustable device projecting through the body from the front thereof and engaging the rear wall of the shell for limiting the movement of the head.

7. The combination of a die-body having a rearwardly extending shank and provided with undercut ways, members provided with thread-cutting means and having lateral extensions projecting into said undercut ways and movable radially of the body, a head slidable on said shank and having a shell encircling substantially the whole of said body and having integral therewith a grooved portion for sliding said head,

said members and head having one a tapered surface and the other a surface coöperating therewith to move the said members inwardly, springs located at the sides of the ways for moving said members outwardly, an adjustable screw passing through the body from the front thereof to engage the rear wall of the head to limit the forward movement of the head on the die-body in one direction, and an adjustable screw turned into said rear wall and having its head engaging a part of said die-body to limit the rearward movement of such head.

EDWIN C. HENN.

Witnesses:

W. R. MITCHELL,
W. F. McMILLAN.