Feb. 6, 1934. O. E. KOEHLER 1,945,906

THREADING DIE AND HOLDER

Filed Jan. 16, 1933

BEST AVAILABLE COPY

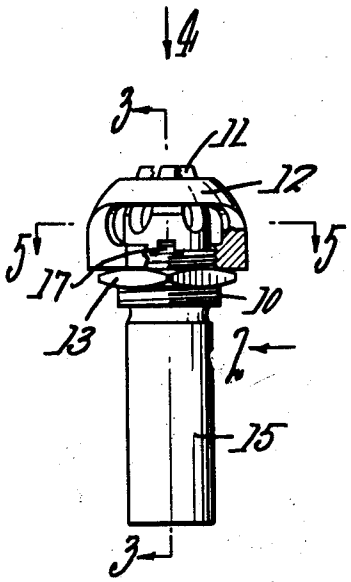


Fig. 1.

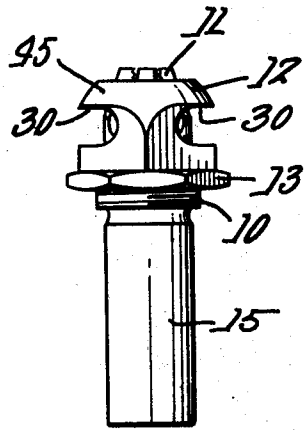


Fig. 2.

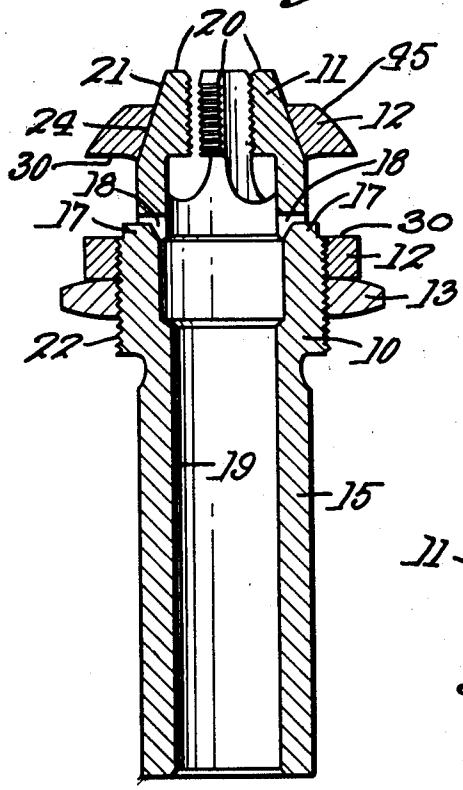


Fig. 3.

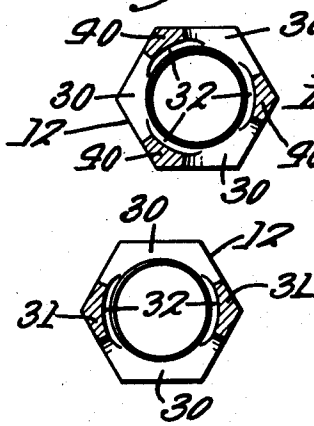


Fig. 6.

Fig. 5.

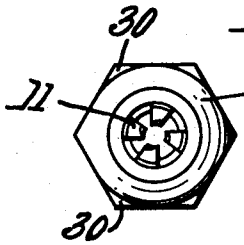


Fig. 4.

Inventor
Oscar E. Koehler
By Attorneys
Lauttgate Fay & Hawley

Patented Feb. 6, 1934 1,945,906

UNITED STATES PATENT OFFICE

1,945,906

THREADING DIE AND HOLDER

Oscar E. Koehler, Greenfield, Mass., assignor to Greenfield Tap & Die Corporation, Greenfield, Mass., a corporation of Massachusetts

Application January 16, 1933. Serial No. 651,919

8 Claims. (Cl. 10—123)

This invention relates to dies for cutting threads on screws, rods and similar articles, and to holders therefor.

My invention relates more particularly to improvements in the type of threading die and holder shown in the prior patent to Loomer, No. 1,212,971 issued January 16, 1917.

It is the general object of my invention to improve the construction of the threading die and holder shown in the Loomer patent, by which improvements the device is strengthened and adapted to resist severe strains and by which improvements ample and satisfactory chip clearance is provided.

My invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

A preferred form of the invention is shown in the drawing, in which

Fig. 1 is a side elevation of my improved threading die and holder, with certain parts shown in section;

Fig. 2 is a side elevation, looking in the direction of the arrow 2 in Fig. 1;

Fig. 3 is an enlarged sectional elevation, taken along the line 3—3 in Fig. 1;

Fig. 4 is a plan view, looking in the direction of the arrow 4 in Fig. 1;

Fig. 5 is a sectional plan view of the die-holding cap, taken along the line 5—5 in Fig. 1, and

Fig. 6 is a view similar to Fig. 5 but showing a slight modification.

Referring to the drawing, I have shown a threading device comprising a holder 10, a die 11, a cap 12 and a lock nut 13. The holder 10 is provided with a cylindrical shank 15 by which it may be supported in a chuck or otherwise secured.

At its opposite end the holder 10 is provided with diametrically opposed lugs or projections 17, adapted to be received in recesses 18 in the inner end face of the die 11. The holder 10 is also provided with an axial recess 19 through which the rods or other articles to be threaded may extend.

The die 11 is provided with upwardly extended threaded lands 20 having conical outer faces 21. The cap 12 is internally threaded in its lower portion to fit an externally threaded portion 22 of the holder 10. The cap 12 is also provided with a conical recess 24 fitting the conical outer faces 21 of the threaded lands 20.

The cap 12 is shown in the drawing as being of hexagonal shape and as adapted to receive a wrench for adjusting the die 11. It will be evident that by screwing the cap 12 on to the portion 22 of the holder 10, the die 11 will be firmly seated against the adjacent end of the holder 10, and it will also be evident that the size of the die may be adjusted by screwing the cap on or off of the holder 10 and thereby varying the pressure on the conical faces 21 of the threading lands. When the die is correctly adjusted, the check or lock nut 13 is tightened to retain the adjustment.

In order to provide chip clearance and also to provide for effective circulation of lubricant, the cap 12 is cut away at opposite sides as indicated at 30, these openings being so disposed that posts 31 are provided at opposite angles of the hexagonal cap. The inner faces of these posts 31 are also cut away to provide clearance spaces 32 around the die 11.

By placing the posts 31 at opposite corners of the hexagonal cap or nut 12, I am able to very substantially increase the cross section of the posts 31 without correspondingly increasing the dimensions of the cap 12 and I am also able to provide maximum clearance for the die 11.

The increased strength of the posts 31 is extremely important, as it solves a serious problem previously encountered in attempts to provide suitable clearance for the die 11.

The outer end of the hexagonal cap or nut 12 is preferably given a substantially conical shape as clearly shown at 45 (Figs. 2 and 3). This conical outer portion, in combination with the arrangement of the posts 31 at the angles of the cap 30, assists materially in applying a wrench to the cap for adjustment purposes, as a socket wrench slipped over the conical portion 44 and posts 31 very readily seats itself on the hexagonal cap 30.

Although I have shown my invention as used in connection with a hexagonal cap, it will be obvious that the invention can also be utilized in connection with caps of other cross section and it will be further obvious that the posts may be differently arranged. In Fig. 6, for instance, I have shown a cap in which three posts 40 instead of two are provided.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:—

1. In a threading die, in combination, an externally threaded holder, a die having spaced threading lands with conical outer surfaces, and a cap mounted on said holder and securing said die thereto, said cap comprising an internally threaded end portion engaging the threaded portion of said holder and an opposite end portion

provided with an internal conical surface engaging the conical surfaces of said lands, said cap being polyangular in transverse section and being provided with widely separated posts at selected corners of said cap by which the two end portions of said cap are connected, the polyangular section forming the posts merging into the conical portion of the cap and said cap being entirely open for chip clearance at the sides between said posts.

2. In a threading die, in combination, an externally threaded holder, a die having spaced threading lands with conical outer surfaces, and a cap mounted on said holder and securing said die thereto, said cap comprising an internally threaded end portion engaging the threaded portion of said holder and an opposite end portion provided with an internal conical surface engaging the conical surfaces of said lands, said cap being polyangular in transverse section and being provided with widely separated posts at selected corners of said cap by which the two end portions of said cap are connected, the outer faces of said posts coinciding with the outer faces of said polyangular cap, and said cap being entirely open for chip clearance at the sides between said posts.

3. In a threading die, in combination, an externally threaded holder, a die having spaced threading lands with conical outer surfaces and a cap mounted on said holder and securing said die thereto, said cap comprising an internally threaded end portion engaging the threaded portion of said holder and an opposite end portion provided with an internal conical surface engaging the conical surfaces of said lands, said cap being polyangular in transverse section and being provided with widely separated posts at selected corners of said cap by which the two end portions of said cap are connected, the polyangular section forming the posts merging into the conical portion of the cap, said cap being entirely open for chip clearance at the sides between said posts and said posts being spaced substantially outwardly from the outer surface of the die for additional circumferential clearance.

4. In a threading die, in combination, an externally threaded holder, a die having spaced threading lands with conical outer surfaces and a cap mounted on said holder and securing said die thereto, said cap comprising an internally threaded end portion engaging the threaded portion of said holder and an opposite end portion provided with an internal conical surface engaging the conical surfaces of said lands, said cap being polyangular in transverse section and being provided with widely separated posts at selected corners of said cap by which the two end portions of said cap are connected, said cap being entirely open for chip clearance at the sides between said posts, the outer faces of said posts coinciding with the outer faces of said cap and the inner face of each post being concave and spaced substantially outwardly from the outer surface of the die for additional circumferential clearance.

5. In a threading die, in combination, an externally threaded holder, a die having spaced threading lands with conical outer surfaces, said die and holder having axially abutting surfaces and having cooperating means to prevent relative rotation, a cap mounted on said holder and securing said die thereto, said lands protruding a substantial distance beyond said cap, said cap comprising an internally threaded inner end portion engaging the threaded portion of said holder and an outer end portion provided with an internal conical surface of substantially less length than said threaded lands and engaging the conical outer surfaces of said lands, said cap being polyangular in transverse section and being provided with posts at selected corners of said cap by which the two end portions of said cap are connected, the polyangular section forming the posts merging into the conical portion of the cap, and being entirely open for chip clearance between said posts, said die forming outwardly discharged chips and said cap being positioned on said holder and die in all adjustments thereof to divide the chip discharge and the lubricant for the die between the end of the die beyond said cap and the clearance openings between said posts.

6. In a threading die, in combination, an externally threaded holder, a die having spaced threading lands with conical outer surfaces, said die and holder having axially abutting surfaces and having cooperating means to prevent relative rotation, said lands protruding beyond a cap mounted on said holder and securing said die to said holder, said cap comprising an internally threaded inner end portion of substantially larger diameter than the maximum diameter of said die and engaging the threaded portion of said holder and an outer end portion provided with an internal conical surface engaging the conical surface of said die lands, said die forming outwardly discharged chips and said outer end portion being so located and being of such axial extent as to divide the chip discharge and lubrication between the end of the die beyond said cap and the inner openings of the cap in all adjusted positions thereof, said cap being polyangular in transverse section and having posts with inner surfaces spaced outward at a larger diameter than the cap threads so as to provide clearance between the outer surfaces of the die and the corresponding interior surfaces of said posts, the polyangular section forming the posts merging into the conical portion of the cap.

7. In a threading die, in combination, an externally threaded holder, a die having spaced threading lands with conical outer surfaces, said die and holder having axially abutting surfaces and having cooperating means to prevent relative rotation, and a cap mounted on said holder and securing said die thereto, said cap comprising an internally threaded inner end portion engaging the threaded portion of said holder and being polyangular in transverse section and being provided with posts at selected corners of said cap by which the two end portions of said cap are connected, the polyangular section forming the posts merging into the conical section of the cap and being entirely open for chip clearance between said posts, said threaded portion of said holder being substantially larger than said die and the inner surfaces of the cap posts being positioned to establish a large clearance space between that portion of the die which is of maximum diameter and the inner surfaces of the posts.

8. In a threading die, in combination, an externally threaded holder, a die having spaced threading lands with conical outer surfaces, said die and holder having axially abutting surfaces and having cooperating means to prevent relative rotation, and a cap mounted on said holder and securing said die thereto, said cap comprising an internally threaded inner end portion engag-

ing the threaded portion of said holder and an outer end portion provided with an internal conical surface engaging the conical outer surfaces of said lands and with a substantially conical outer surface, said die forming outwardly discharged chips and said cap being polyangular in transverse section and being provided with chip discharge openings between the two end portions of said cap, and the combined area of said chip discharge openings being substantially larger than the combined area of the chip discharge openings of said die, thereby permitting free chip discharge in all adjusted positions of the cap, the inner and outer end portions of the cap being connected by posts at selected corners of the cap, and the polyangular sections forming the posts merging into the conical portion of the cap.

OSCAR E. KOEHLER.