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W. J. HOGG

1,783,539

THREADING DIE

Filed March 20, 1928

Fig. 1.

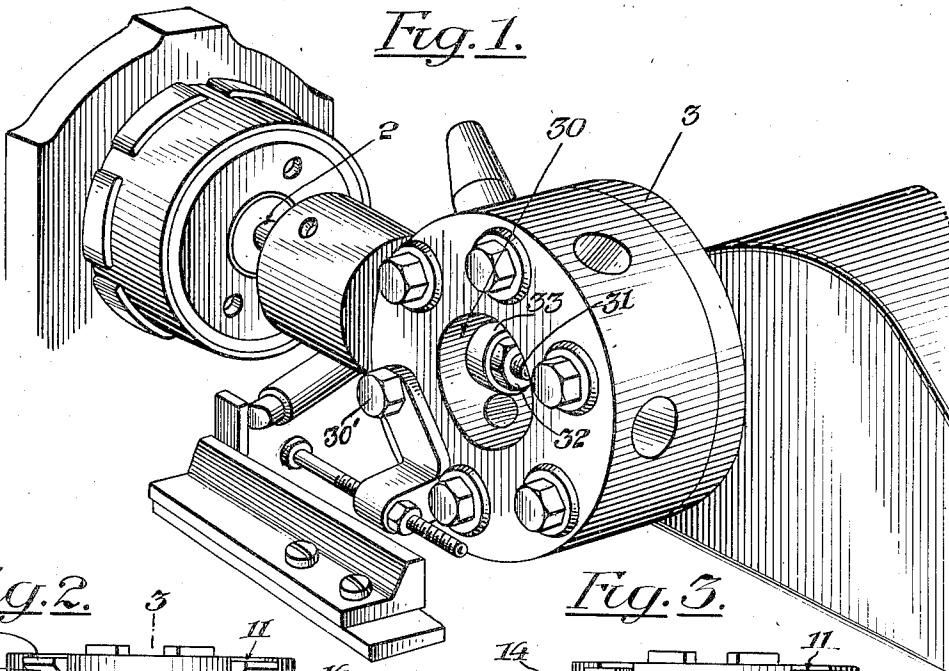


Fig. 2.

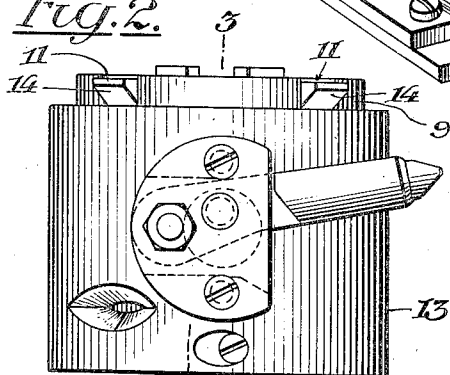


Fig. 3.

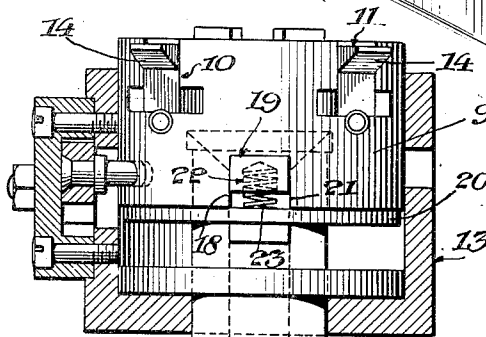


Fig. 4.

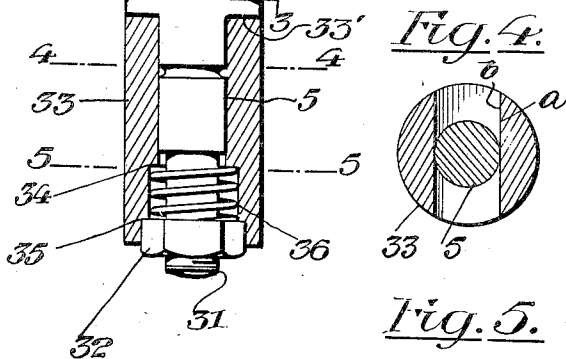
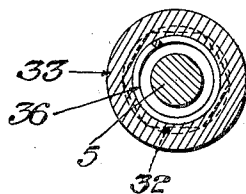


Fig. 5.



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THREADING DIE

Application filed March 20, 1928. Serial No. 263,013.

This invention relates to threading dies of that class particularly adapted for use with metal working machines, such as single spindle or hand screw machines, the object of the invention being to provide an improved die whereby the float thereof can be adjusted without removing the die from the machine.

A further object of the invention is the provision of an improved self-opening die having a floating shank.

In the drawings accompanying and forming a part of this specification—

Figure 1 is a perspective view illustrating so much of a Brown and Sharpe automatic screw machine as is believed necessary properly to show this improved threading die in position;

Fig. 2 is a side view of this improved threading die with the shank thereof in section;

Fig. 3 is a longitudinal, sectional view of this improved die taken on line 3—3, Fig. 2;

Fig. 4 is a cross-sectional view of the shank taken on line 4—4, Fig. 2; and

Fig. 5 is a cross-sectional view of the shank taken on line 5—5, Fig. 2.

Similar characters of reference indicate corresponding parts in the several views.

Before explaining in detail the present improvement and mode of operation thereof, I desire to have it understood that the invention is not limited to the details of construction and arrangement of parts which are illustrated in the accompanying drawings, since the invention is capable of other embodiments, and that the phraseology which I employ is for the purpose of description and not of limitation.

In the present instance this improved die is shown applied to a Brown and Sharpe automatic screw machine, which, as is well-known, has a single rotating work spindle, such as 2. In the front thereof and slidingly supported for movement toward and from this work spindle, is a horizontally supported

tool turret 3 provided with means for attaching thereto a series of tools, and this turret is suitably indexed by means, which it is not necessary to show, to carry each tool successively into position to perform its work on the stock carried by the work spindle, this work spindle being rotated by suitable means not deemed necessary to show.

It is the practice, when necessary to thread a piece of work, to mount on this tool turret a threading die, the chasers or cutters of which, when a "Namco" die is used, being automatically opened by the work drawing these cutters or chasers out of the cap, whereupon the chasers are automatically closed in readiness for the next piece of work, and the means for closing the chasers in the form of die illustrated herein is shown and described in my contemporaneously-pending application, Serial No. 254,358, filed February 15, 1928, owned by The National Acme Company, and therefore, a further description thereof herein is deemed unnecessary.

The main features of the die head herein shown are also substantially similar to those shown and described in the contemporaneously-pending application owned by The National Acme Company, Serial No. 155,374, filed December 17, 1926, and only a brief description thereof is, therefore, deemed necessary herein.

This die comprises a body 9 having a shank 5 and this body is provided with a series of radially-located slots 10 for the reception of the cutters or chasers 11, which are shifted outwardly by suitable springs, the chasers or cutters being closed or collapsed when the body is forced into the cap 13 by means of cam-faces 14 carried by the chasers. Suitable adjusting means is provided for setting the chasers to cut the desired thread.

The die body 9 is provided with a pair of radially extending aligned recesses 18 for the reception of a pair of opposed radially-extending driving lugs 19 integral with the

die shank 5. These driving lugs are retained in place by a retaining ring 20 secured to the rear of the die body by suitable screws. The recesses 18 are of such depth relative to the driving lugs 19 as to form a clearance space 21 between the driving lugs and the retaining ring 20 when the die is in its normal assembled condition.

The driving lugs 19 are provided with openings 22 for the reception of springs 23, the opposite ends of which engage the retaining ring 20. These springs 23 maintain the die body 9 in a fixed end relation relative to the driving lugs 19,—that is to say, they hold the driving lugs in engagement with the front walls of the recesses 18 (see Fig. 3), while permitting forward movement of the die body relatively to these driving lugs and the shank 5, owing to the clearance space 21, thereby properly to position the threading dies or chasers 7 for opening movement to release the work.

This construction thus provides a floating die head, but any adjustment of this floating head is not possible except by removal of the die from its turret and, therefore, I have also provided this die with a floating shank, which permits longitudinal adjustment of the shank to compensate for the difference between the lead of the thread which is being cut and the forward travel of the tool turret or slide and by reason of the axial opening 30 in the tool turret, this adjustment can be effected without removing the die from the turret. In this improved die the shank 5 has a threaded end 31 provided with a threaded nut 32 and the shank is reduced for the reception of a bushing 33 in position to engage the shoulder 33' of the shank formed by the reduced portion thereof, and the bushing is recessed or bored to provide a pair of shoulders 34 and 35 and in this recess is located a coil spring 36 engaging one of the shoulders as 34 of the bushing for holding the bushing in place on the threaded end of the die shank. The nut 32 is carried on the threaded end of the shank adjacent to the other shoulder as 35 of the bushing for compressing the spring and thereby adjusting the amount of float the die shank is to have. If no float is required, the nut is tightened against the shoulder of the bushing, as shown in Figs. 2 and 3, the nut being adjustable away from this shoulder to regulate or adjust the amount of float the die shank is to have. This construction is particularly useful when the travel of the tool turret 3 of a Brown and Sharpe machine is slower than the lead of the thread being cut and allows the die head to move forward ahead of the travel of the turret, the adjusting nut 32 being effective to adjust or set the amount of float required, and, as will be observed, this adjusting nut is accessible thru the axial bore 30 of the tool turret without removing the die from the turret, while the

bushing is clamped in the radial opening of the turret by a fastening bolt, such as 30', the bushing 33 and shank 5 being so connected that rotation of one relatively to the other is prevented, and for this purpose the bushing has its bore formed with flat faces *a* (see Fig. 4) co-operating with similar flat faces *b* of the shank, so that rotation of the die shank is prevented when the bushing is clamped in the tool turret.

Thus I have provided a die in which the body is not only a floating one, but in which the shank is also a floating one, and in which the adjustment of the shank to regulate the amount of float of this shank can be taken care of without removing the die from the tool turret by reason of the fact that this adjustment can be effected at the rear end of the shank.

It is to be understood that by describing in detail herein any particular form, structure or arrangement, it is not intended to limit the invention beyond the terms of the several claims or the requirements of the prior art.

Having thus explained the nature of my said invention and described a way of constructing and using the same, although without attempting to set forth all of the forms in which it may be made, or all of the modes of its use, I claim:

1. In a metal working machine, the combination of a tool turret having a centrally-located bore and a radial opening communicating with said bore, a threading die having an adjustable shank located in said radial opening with the end thereof projecting into said central bore, said shank comprising a reduced portion forming a shoulder, a bushing fitting the reduced portion of the shank with the inner end terminating at and in position to engage the shank shoulder, means located at the end of the shank and accessible through the central bore of the turret for adjusting the shank, means between said last means and bushing whereby one part of the shank has a floating movement relative to the other, means carried by the turret for clamping the bushing of the shank in the turret, and said bushing and shank having means for preventing the rotation of one relatively to the other.

2. In a metal working machine, the combination of a tool turret having a centrally-located bore and a radial opening communicating therewith, a threading die having an adjustable shank located in said radial opening with the end thereof projecting into said central bore, said shank comprising a reduced portion forming a shoulder and provided with a threaded end, a bushing fitting the reduced portion of the shank with its inner end terminating at and in position to engage the shank shoulder and having a pair of shoulders, means located at the end of the shank and accessible through the central

bore of the turret for adjusting the shank and comprising an adjustable nut on the threaded end of said shank and in position to engage one of the bushing shoulders, a spring
5 between said nut and the other bushing shoulder whereby one part of the shank has a floating movement relatively to the other, means carried by the turret for clamping the bushing of the shank, and said bushing and shank
10 having means for preventing the rotation of one relatively to the other.

Signed at Cleveland, Ohio, this 17th day of March, 1928.

WILLIAM J. HOGG.

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