

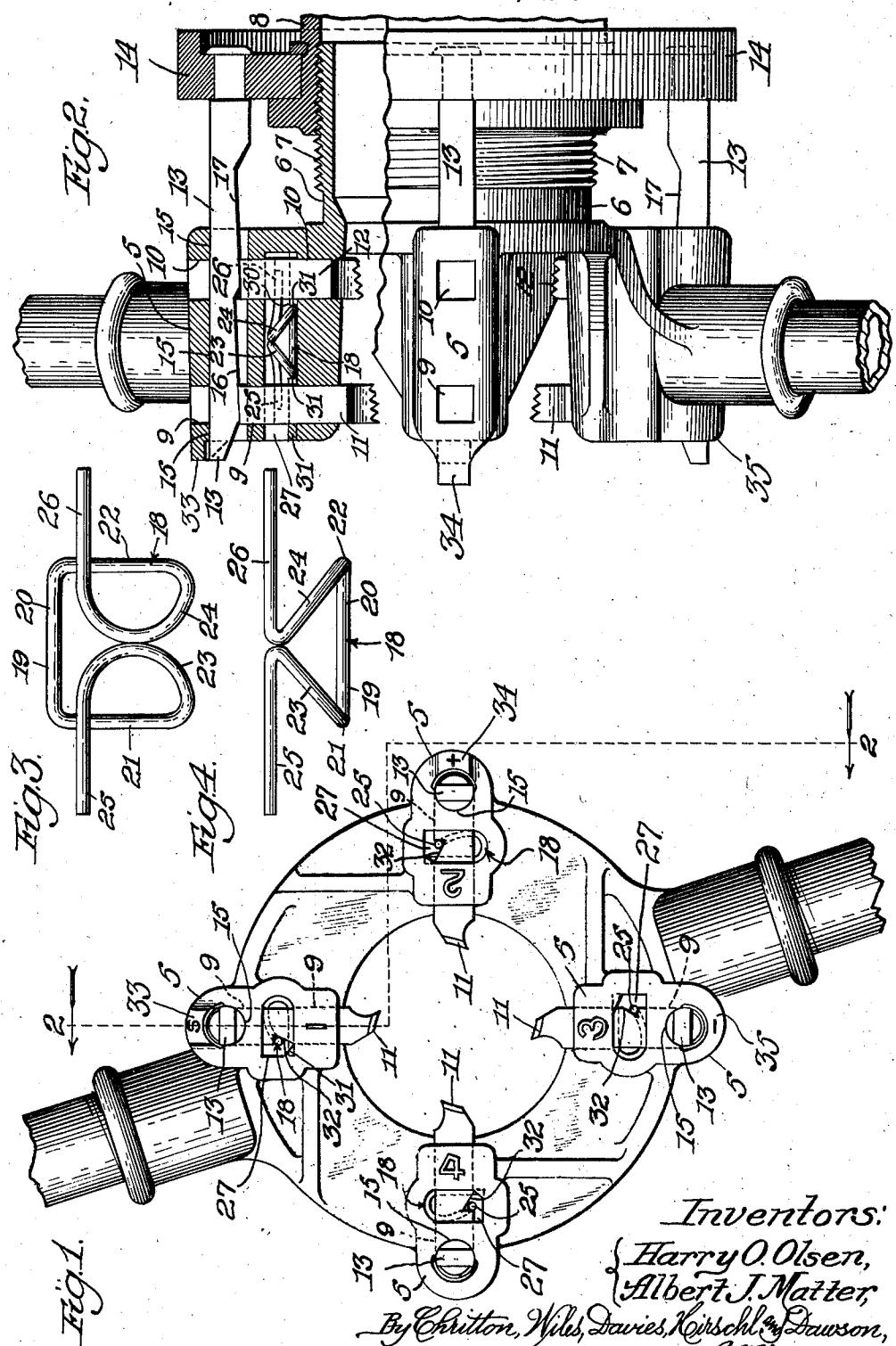
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DIESTOCK

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DIESTOCK

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Our invention relates to improvements in die stocks of the general type comprising radially movable chasers and means cooperating therewith to control the receding movement of the chasers as the operation of cutting the thread on an object, such as for example a pipe, progresses.

One of our objects is to provide a construction of die stock of the type referred to which shall be adapted for the threading of articles of different diameters selectively without requiring the adjustment or repositioning of the chasers for the different diameter articles thereby facilitating the use of the stock in the threading of articles of different diameters.

Another object is to provide a novel, simple and inexpensive construction of spring means.

Another object is to provide in a die stock of the type referred to and provided with plural sets of chasers for articles of different diameters, a novel, simple and economical construction of means controlling the receding of the chasers as the thread-cutting operation progresses; and a novel, simple and economical construction of spring means associated with the chasers for yieldingly urging them to receded position.

Another object is to provide indexing or positioning means for facilitating the setting of the parts of the die stock for cutting a standard size of thread or a slightly larger or smaller thread, when desired, and other objects as will be understood from the following description.

Referring to the accompanying drawing:

Figure 1 is an end view of a die stock embodying my invention.

Figure 2 is a section taken at the irregular line 2—2 on Fig. 1 and viewed in the direction of the arrows.

Figure 3 is a plan view of one of the similar springs for urging the chasers toward receded position; and

Figure 4, a view in side elevation of the spring of Fig. 3.

The particular construction shown which constitutes an embodiment of our invention in which provision is made for the selective threading of two different diameters of articles, comprises a ring member 5 having a coaxial hub portion 6 at one side thereof externally threaded as represented at 7, at which it has threaded connection with the cylindrical hub portion 8 (shown in part only), of a holder in which the article to be threaded would be rigidly clamped in accordance with common practice, the die stock and work holder in producing a thread on the article being

relatively rotated, in which movement the die stock and work holder, by reason of the threaded connection between them, have relative movement toward each other.

The ring member 5 is provided with two sets 9 and 10 of radial openings at different positions along the longitudinal axis of the stock for receiving and guiding two sets 11 and 12 of radially movable thread-cutting chasers, each set comprising four chasers spaced apart 90°.

The chasers cooperate with means for controlling the receding of the chasers as the cutting of the thread on the article progresses, the means shown comprising pins 13 of like form and size secured at one end to a ring 14 journaled on the hub portion 8 of the work holder and held against longitudinal movement thereon. The pins 13 which at their outer ends extend guidingly through openings 15 in the ring member 5 are formed intermediate their ends with taper surfaces 16 and 17 which oppose the outer ends of the sets 11 and 12 of the chasers, respectively, the chasers being held at all times against these taper surfaces by spring means hereinafter described.

The arrangement and proportioning of the chasers and taper pins is such, as shown, that the inner cutting ends of the set 11 of chasers extend closer to the longitudinal axis of the stock than the set 12, the set 12 of chasers, by way of example, being provided to thread a 2" pipe and the set 11 of chasers a 1½" pipe; it being understood that the article to be threaded extends into the die stock from the right hand side in Fig. 2.

By this arrangement either size pipe may be threaded without adjustment or rearrangement of the chasers, thus saving considerable time in the selective threading of articles of different diameters.

Whether used to thread one or the other of two different diameter articles, the chasers operating on the article move radially outwardly under the control of the spring means and the taper surfaces of the pins 13, and thus produce the desired tapering thread on the article.

The spring means referred to preferably comprise a set of spring members 18, one for each of two adjacent chasers of the sets thereof, each member, formed of spring wire, being shaped to present a central yoke portion 19 having a cross piece 20 and substantially parallel legs 21 and 22 from the outer ends of which arms 23 and 24, respectively, curved toward the center of the yoke 19 and the cross piece 20, extend upwardly in

upwardly converging relation as shown in Fig. 4 and terminate in substantially straight oppositely extending portions 25 and 26 substantially parallel with the cross piece 20 and located above the plane of the latter.

The several spring members 18 are located in openings 27 in the ring members which intersect the openings 9 and 10 in which the chasers are slidably, the openings 27 containing fillets 30 at their opposite ends located in corners of these openings with their inner ends spaced apart and extending inwardly beyond the openings 9 and 10 as illustrated in Fig. 1 of the fillets for one spring, the inner ends of the fillets 30 affording opposed shoulder portions 31.

In assembling the parts of the die stock the spring members 18 are introduced lengthwise into the openings 27 to seat their yoke portions 19 at their cross pieces 20 in the recesses afforded between the pairs of shoulders 31, which latter prevent endwise displacement of the spring members in the openings 27, the end portions 25 and 26 of the spring members extending into the planes of the adjacent openings 9 and 10, the pins 13 in this operation being withdrawn from the ring 5. The chasers are then introduced into the openings 9 and 10 from the exterior of the ring 5 and in such movement the end portions 25 and 26 of the spring members enter recesses 32 in the chasers. The pins 13 are then inserted into the openings 15 to the position shown in which operation the chasers are forced radially inward deforming the ends of the spring members 18 against their spring tension as shown in Fig. 2 whereby in the use of the stock for threading an article, the springs continuously urge the chasers against the taper surfaces of the pins 13 during the movement of the stock along the pins toward the work holder.

It is sometimes desirable, in practice, to provide for the cutting of a thread of slightly greater or slightly smaller size than a given standard size thread, as for example a few thousandths of an inch different from the standard size thread. This may be effected in the construction shown as to both sets 10 and 11 of the chasers by relatively longitudinally moving the sets of chasers and the pins 13 in a direction toward or away from each other in the direction of the length of the pins by turning the die stock at its threaded connection 7 with the workholder 8 in one direction or the other, as the case may be, to effect the proper setting of the device preliminary to starting the thread cutting operation.

To facilitate the preliminary setting of the parts of the die stock for either a standard size thread or an oversize thread or an under size thread, indexing or positioning means are provided. These means in the construction shown comprise surfaces 33, 34 and 35 on the ring member 5 extending to different, proper, distances in a direction lengthwise of the pins 13.

When the sets of chasers and the pins 13 are relatively adjusted as stated to a position in which the outer end surface of the one of the taper pins 13 adjacent the surface 33 is flush with the surface 33, as shown in Fig. 2, the chasers and pins 13 will be in the proper relative positions for cutting a standard thread—in the example shown a 1½ inch thread by the set 11 of chasers, and a 2 inch thread by the set 12 of chasers. When the sets of chasers and the pins 13 are relatively adjusted to a position in which the outer end surface of the one of the pins 13 adjacent the surface 34 is flush with the surface

34, the sets of chasers and pins 13 will be in the proper relative positions for cutting slightly larger size threads than the standard size threads; and when the sets of chasers and pins 13 are relatively adjusted to a position in which the outer end surface of the one of the taper pins adjacent the surface 35 is flush with the surface 35, the sets of chasers and the pins 13 will be in the proper relative positions for cutting slightly smaller size threads than the standard size threads.

Preferably the surfaces 33, 34 and 35 will have associated therewith, as shown, indicia, such as the S + and — signs, respectively, to facilitate the making of the adjustments referred to.

As will be noted from Fig. 2, the portions of the taper surfaces 16 and 17 which are contacted by the outer ends of the chasers 11 and 12, respectively, at the start of the threading operation, are located at the same distance from the longitudinal axis of the die stock. This is desirable as thereby the standard form of chasers may be used and the cutting edges of the chasers for both sizes of pipes will be in the proper position relative to the longitudinal axis of the die stock.

Furthermore, this feature permits replacing both sets of standard chasers for threading two sizes of pipes, with two other sets of standard chasers for threading two other sized pipes, or removing one set of chasers, as for example the chasers 12 and replacing them with another set of standard chasers, as for example the chasers 11 and replacing the chasers 11 with standard chasers for threading a smaller sized pipe.

While we have illustrated and described a particular embodiment of our invention we do not wish to be understood as intending to limit it thereto as the structure shown may be variously modified and altered and the invention embodied in other forms of structure without departing from the spirit of the invention; thus while we have shown the stock as having two sets only of chasers for threading only two standard sizes of articles, it will be understood that, if desired, more than two sets of chasers, adapting the structure for threading more than two standard sizes of articles, may be provided, the set for the largest article being the closest one to the work holder and the remaining sets being decreasingly graduated in size therefrom in a direction away from the work holder.

Furthermore, as to the feature of conditioning the device for cutting oversize and undersize threads described and shown in a die stock having a plurality of sets of chasers, it will be understood that this feature may also be provided in a die stock having a single set only of chasers.

What we claim as new and desire to secure by Letters Patent is:

1. A die stock for cooperation with a workholder, comprising a plurality of sets of radially movable chasers located in different planes transversely of the axis of the die stock, the chasers of the respective sets, in the normal condition of the die stock, being positioned inwardly to progressively greater distances from the end of the die stock nearest the workholder toward its opposite end, adapting the die stock for threading articles of different sizes.

2. A die stock for cooperation with a workholder, comprising a plurality of sets of radially movable chasers located in different planes transversely of the axis of the die stock, the chasers of the respective sets, in the normal condition of the die stock, being positioned inwardly to pro-

gressively greater distances from the end of the die stock nearest the workholder toward its opposite end, adapting the die stock for threading articles of different sizes, and means for permitting radial outward movement of the chasers during the threading operation.

3. A die stock for cooperation with a workholder, comprising a plurality of sets of radially movable chasers located in different planes transversely of the axis of the die stock, the chasers of the respective sets, in the normal condition of the die stock, being positioned inwardly to progressively greater distances from the end of the die stock nearest the workholder toward its opposite end, adapting the die stock for threading articles of different sizes, and means for permitting radial outward movement of the chasers during the threading operation, said means including a tapered member against which a chaser of each set thereof bears, said member and die stock being relatively movable as the threading proceeds.

4. In a die stock, the combination of a ring member, sets of chasers located in different planes transversely of the axis of the die stock and radially slidable in said ring member, means controlling the radial outward movement of said chasers, and spring devices on said ring member each cooperating with a chaser of each set thereof and simultaneously urging the chasers of each set into cooperative relationship with said means.

5. In a die stock, the combination of a ring member, sets of chasers located in different planes transversely of the axis of the die stock and radially slidable in said ring member, means controlling the radial outward movement of said chasers, and spring devices on said ring member each having end portions engaging with a chaser of each set thereof and simultaneously urging the chasers of each set into cooperative relationship with said means.

6. In a die stock, the combination of a ring member, sets of chasers located in different transverse planes spaced along the axis of the die stock and radially slidable in said ring member, means controlling the radial outward movement of said chasers, and spring devices on said ring member each having a holding portion between its ends at which it is held to said ring member, spring end portions engaging with a chaser of each set thereof and transverse portions connecting said holding portion and said end portions together, said spring devices yieldingly urging the chasers into cooperative relationship with said means.

7. In a die stock, the combination of a ring member, sets of chasers located in different transverse planes spaced along the axis of the die stock and radially slidable in said ring member, means controlling the radial outward movement of said chasers, and spring devices on said ring member each having a holding portion between its ends at which it is held to said ring member, spring end portions engaging with a chaser of each set thereof and transverse convoluted portions connecting said holding portion and said end portions together, said spring devices yieldingly urging the chasers into cooperative relationship with said means.

8. In a die stock, the combination of a ring member having radial guideways located in different transverse planes spaced along the axis of the die stock and openings extending crosswise of, and intersecting said guideways, sets of chasers radially slidable in said guideways, means controlling the radial outward movement of said

chasers, and spring devices located in said openings each having end portions engaging with a chaser of each set thereof and urging the chasers into cooperative relationship with said means.

9. In a die stock, the combination of a ring member having radial guideways located in different transverse planes spaced along the axis of the die stock and openings extending crosswise of, and intersecting, said guideways, inwardly extending spaced apart stops in said openings, sets of chasers radially slidable in said guideways, means controlling the radial outward movement of said chasers, and spring devices located in said openings each having a portion entered between said stops and held thereby against lengthwise movement and end portions engaging a chaser of each set thereof and urging the chasers into cooperative relationship with said means.

10. In a die stock, the combination of a ring member having radial guideways located in different transverse planes spaced along the axis of the die stock and openings extending crosswise of, and intersecting, said guideways, inwardly extending spaced apart stops in said openings, sets of chasers radially slidable in said guideways, means controlling the radial outward movement of said chasers, and spring devices located in said openings each having a portion entered between said stops and held thereby against lengthwise movement and transversely extending portions terminating in outwardly oppositely extending end portions for engagement with a chaser of each set thereof and urging the chasers into cooperative relationship with said means.

11. In a die stock, the combination of a ring member having radial guideways located in different transverse planes spaced along the axis of the die stock and openings extending crosswise of, and intersecting, said guideways, inwardly extending spaced apart stops in said openings, sets of chasers radially slidable in said guideways, means controlling the radial outward movement of said chasers, and spring devices located in said openings each having a portion entered between said stops and held thereby against lengthwise movement and transversely extending coil portions terminating in outwardly oppositely extending end portions for engagement with a chaser of each set thereof and urging the chasers into cooperative relationship with said means.

12. In a die stock, the combination of a ring member, chasers radially movable in said ring member, and tapered members against which said chasers bear, said chasers and tapered members being relatively movable in a direction lengthwise of said tapered members, said tapered members permitting radial outward movement of said chasers during said relative movement, said ring member having a plurality of circumferentially spaced surfaces extending forwardly to different distances in a direction lengthwise of the tapered members for cooperation with ends of said tapered members for determining the proper relative positioning of said chasers and tapered members, preliminary to starting the cutting operation, for cutting a standard thread or a slightly oversize or undersize thread.

13. In a die stock, the combination of a ring member, a plurality of sets of chasers radially movable in said ring member, said sets of chasers being located in different planes transversely of the axis of the die stock, the chasers of the respective sets, in the normal condition of the die

stock, being positioned inwardly to progressively greater distances from the end of the die stock nearest the workholder toward its opposite end adapting the die stock for threading articles of different sizes, tapered members against each one of which a chaser of each set thereof bears, said chasers and tapered members being relatively movable in a direction lengthwise of said tapered members, said tapered members permitting radial outward movement of said chasers during said relative movement, and means, including portions of certain of said tapered members for indicating the relative positioning of said chasers and tapered members, preliminary to starting the cutting operation, for cutting standard threads or slightly oversize or undersize threads.

14. In a die stock, the combination of a ring member, sets of chasers located in different planes transversely of the axis of the die stock and radially slidably in said ring member, the chasers of each set being circumferentially spaced, means controlling radial outward movement of said chasers, and spring devices on said ring member each having a central portion adapting the device to be held in position on said ring member and transversely extending portions terminating in outwardly oppositely extending end portions for engagement with adjacent chasers of each set, said spring devices yieldingly urging the chasers into cooperative relationship with said means.

15. In a die stock, the combination of a ring member, sets of chasers located in different planes transversely of the axis of the die stock and radially slidably in said ring member, the chasers of each set being circumferentially spaced, means controlling radial outward movement of said chasers, and spring devices on said ring member and each having a central yoke portion adapting the device to be held in position on said ring member and transversely extending coil portions on the arms of the yoke terminating in outwardly oppositely extending end portions for engagement with adjacent chasers of each set, said spring devices yieldingly urging said chasers into cooperative relationship with said means.

16. A die stock for cooperation with a workholder, comprising a plurality of sets of radially movable chasers located in different planes transversely of the axis of the die stock, the chasers of each set being circumferentially spaced, the chasers of the respective sets, in the normal condition of the die stock, being positioned inwardly to progressively greater distances from the end of the die stock nearest the workholder toward its opposite end, adapting the die stock for threading articles of different sizes, the adjacent chasers of said sets being disposed in line longitudinally of the die stock.

17. A die stock for cooperation with a workholder, comprising a plurality of sets of radially movable chasers located in different planes transversely of the axis of the die stock, the

chasers of each set being circumferentially spaced, the chasers of the respective sets, in the normal condition of the die stock, being positioned inwardly to progressively greater distances from the end of the die stock from the end thereof nearest the workholder toward its opposite end, adapting the die stock for threading articles of different sizes, the adjacent chasers of said sets being disposed in line longitudinally of the die stock, and means for permitting radial outward movement of said chasers during the threading operation comprising a taper pin for each aligning pair of said chasers.

18. A die stock for cooperation with a workholder, comprising a plurality of sets of radially movable chasers located in different planes transversely of the axis of the die stock, the chasers of the respective sets, in the normal condition of the die stock, being positioned inwardly to progressively greater distances from the end of the die stock nearest the workholder toward its opposite end, adapting the die stock for threading articles of different sizes, and means for permitting radial outward movement of the chasers during the threading operation, said means including taper pins each having a plurality of taper surfaces so disposed that one chaser of each set thereof bears against said taper surfaces, respectively, said pins and said die stock being relatively movable as the threading proceeds.

19. A die stock for cooperation with a workholder, comprising a plurality of sets of radially movable chasers located in different planes transversely of the axis of the die stock, the chasers of the respective sets, in the normal condition of the die stock, being positioned inwardly to progressively greater distances from the end of the die stock nearest the workholder toward its opposite end, adapting the die stock for threading articles of different sizes, and means comprising taper pins with spaced chaser-engaging portions thereon for permitting radial outward movement of the chasers during the threading operation, the portions of said taper pins which are engaged by the chasers of said sets at the start of the threading operation being spaced the same distance from the longitudinal axis of the die stock.

20. In a die stock, the combination of an annulus having a circular series of spaced apart housings extending therefrom lengthwise of the die stock, sets of radial chaser-ways in each of said housings, said sets being located at different transverse planes spaced apart a substantial distance along said axis, and chasers in said chaser-ways, the chasers of the respective sets, in the normal condition of the die stock, being positioned inwardly to progressively greater distances from the end of the die stock nearest the workholder toward its opposite end, adapting the die stock for threading article of different sizes.

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