

C. P. ASTROM.
DIE STOCK.
APPLICATION FILED JUNE 7, 1913.

1,250,113.

Patented Dec. 11, 1917.
3 SHEETS—SHEET 1.

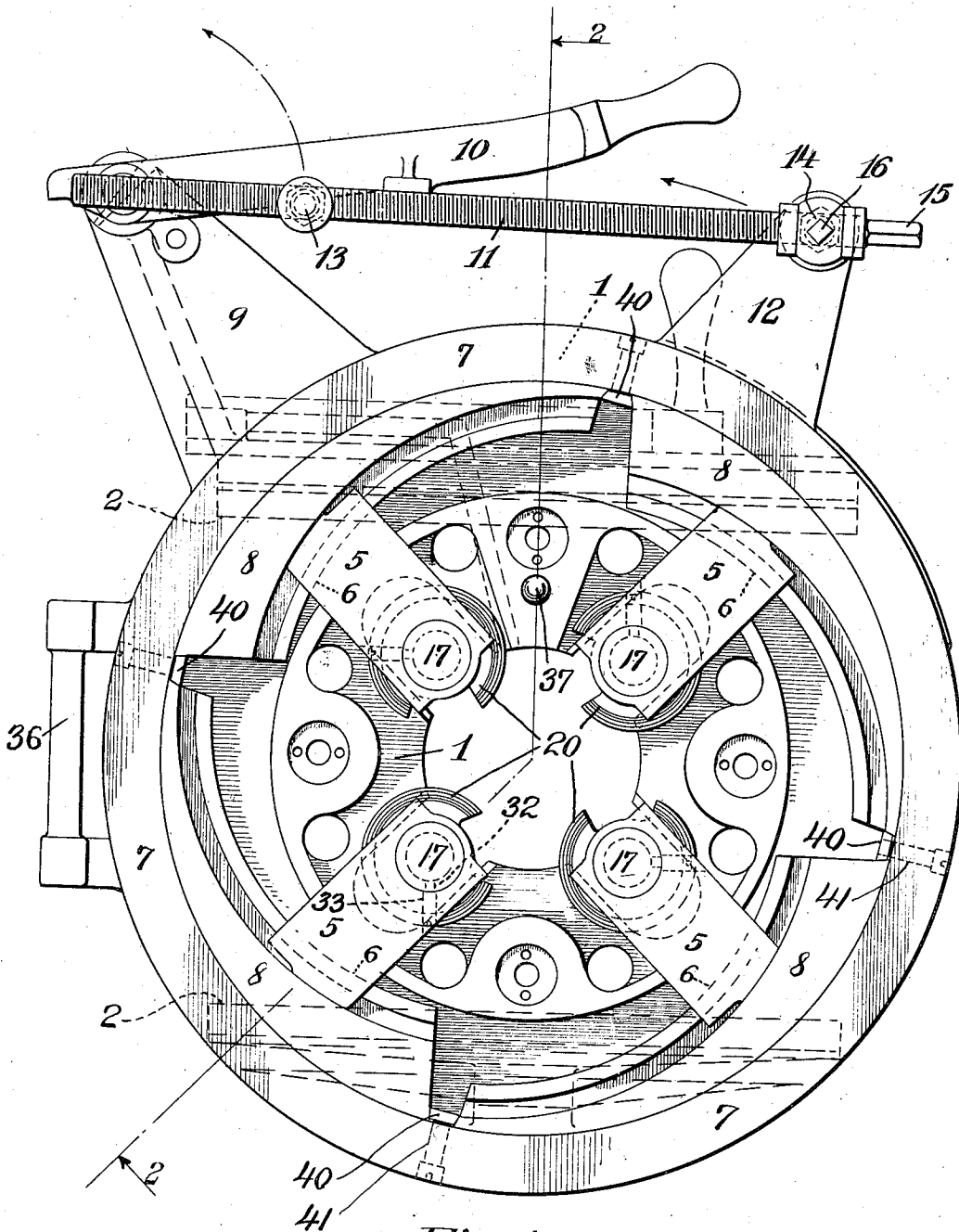


Fig. 1

Witnesses:
Joseph D. Connolly
M. W. Love

Inventor
Carl P. Astrom,
By his Attorneys
Edwards, Sager & Wooster.

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3 SHEETS—SHEET 2.

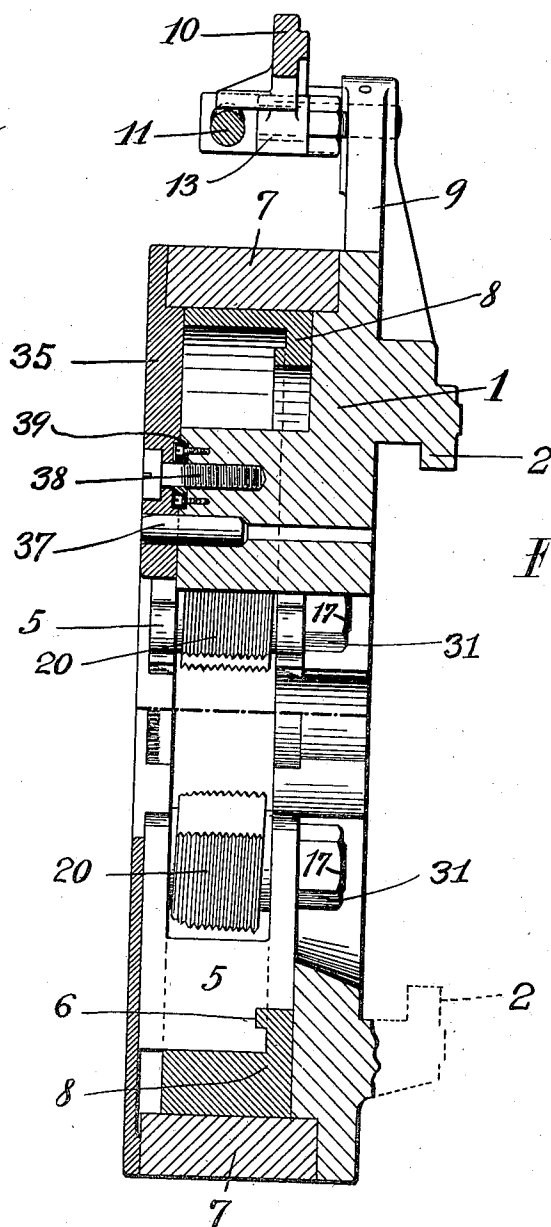


Fig. 2

Witnesses:
Joseph D. Connolly.
J. S. Love

Inventor
Carl P. Astrom,
By his Attorneys
Edward Sager Wooster.

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3 SHEETS—SHEET 3.

Fig. 3

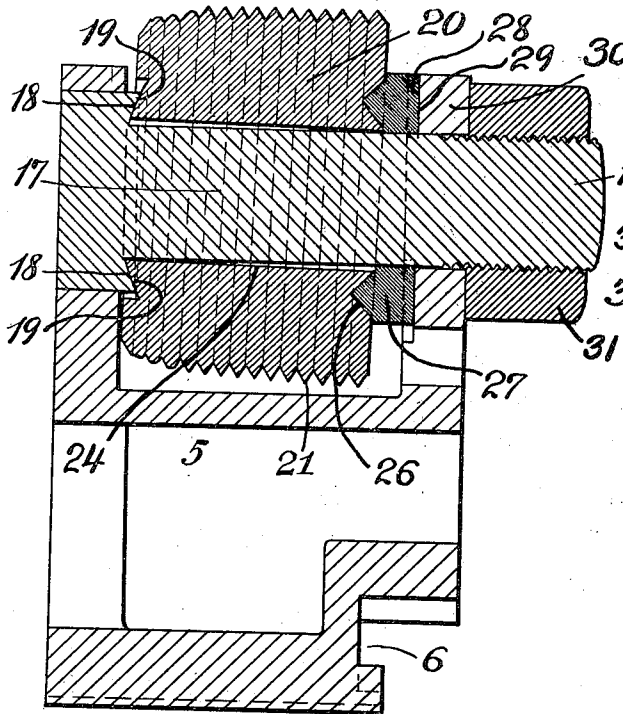
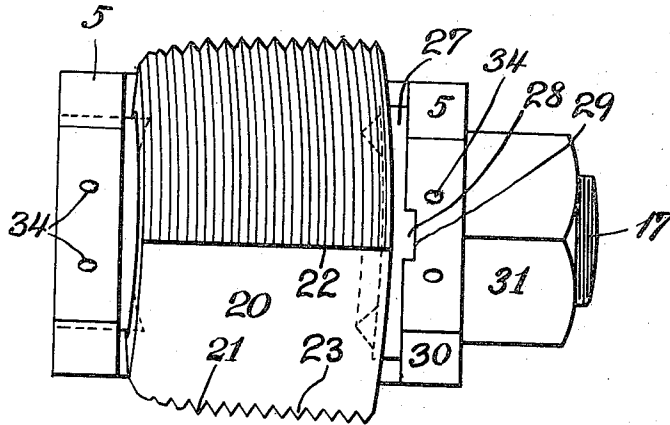
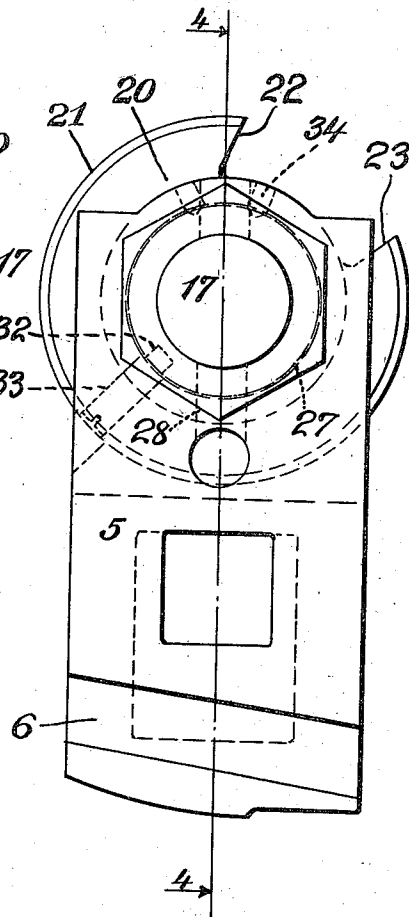


Fig. 4

Fig. 5



Witnesses:
Joseph D. Connolly.
W. L. Love,

Inventor
Carl P. Astrom,
By his Attorneys
Edward, Lager & Wooster

UNITED STATES PATENT OFFICE.

CARL P. ASTROM, OF EAST ORANGE, NEW JERSEY, ASSIGNOR TO M. H. TREADWELL COMPANY, A CORPORATION OF NEW YORK.

DIE-STOCK.

1,250,113.

Specification of Letters Patent.

Patented Dec. 11, 1917.

Application filed June 7, 1913. Serial No. 772,248.

To all whom it may concern:

Be it known that I, CARL P. ASTROM, a citizen of the United States, residing at East Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Die-Stocks, of which the following is a full, clear, and exact specification.

This invention relates to die stocks, particularly intended for threading pipes, wherein the dies not only have to withstand rough usage but have to provide for considerable variation of the diameter of thread to be cut. In the form herein shown, the dies are expansively mounted, but certain features of the invention concerned more particularly with the construction and mounting of the dies themselves are equally applicable to rigid dies.

While it has heretofore been proposed to employ round or cylindrical dies which could be ground to provide additional cutting edges as required, so far as I am aware, such devices have not been practically successful, and flat dies are now generally used. In some prior instances, it has been proposed to employ spirally cut round dies, the disadvantage of which is that when one die is ground the others have to be ground equally in order to avoid cutting up the thread, and where circularly cut dies are used, similar to hobs, difficulty has been found in firmly clamping and mounting the dies, so that they could be readily taken out and replaced, and in expanding and contracting them.

According to this invention, I have provided a cam expanding means which engages with radially movable die carriers, in which, by novel clamping and setting means, round dies are adjustably mounted. Provision is also made for cutting a right or left-hand thread with the same dies by reversing a washer and interchanging certain of them. The washer not only tips the dies to the proper angle, but also serves in maintaining them against movement during the thread cutting operation.

The invention will be more fully understood in connection with the accompanying drawings, wherein—

Figure 1 is a front view of an expansible

die stock embodying the invention, the face plate being removed;

Fig. 2 is a vertical cross section on the line 55 2, 2 of Fig. 1; and

Figs. 3, 4 and 5 are detail views of the die carrier and die fastening means.

1 represents the base having parallel slides 2, 2 on the rear face to engage the frame or other part of the machine. The base 1 is also provided with four radial slots in which are mounted the radially movable die carriers 5, these die carriers 5 being provided with cam slots 6 which engage a rotary cam ring 7 provided with cams 8, the cam ring 7 being oscillated by means of a lug 9 to which is pivoted lever 10 connected by screw 11 with a stationary lug 12, the screw 11 being pivoted at point 13 to lever 10 and at point 14 to lever 12, and being adjustable by head 15 on one end. 16 is a set screw for maintaining adjustment.

The die carriers 5 consist of forked or slotted blocks carrying bolts 17, whose heads are inserted in the front side of the die carriers 5, having a tight fit so as to prevent any bending or lateral play. The inner surfaces of these bolts 17 are made spherical as at 18, to engage with complementary spherical surfaces 19 on the dies 20. The dies 20 have circularly cut teeth 21 and are notched as at 22, 23 to form oppositely disposed cutting faces, one face, as 22, being used for right-hand threads, and the other face, as 23, being used for left-hand threads, upon tipping the dies to the proper angle in one or the other direction, and interchanging two opposite dies, which will be properly marked for this purpose, as seen in the drawings. To tip the dies so as to give them the proper lead, and at the same time to enable them to be clamped rigidly in the die holders 5, the bore 24 of the dies is made somewhat larger than the diameter of bolts 17, so that the spherical surface 19 of the dies can move on the spherical surface of the bolt head, these spherical surfaces being formed upon such radius relatively to the threads to be cut that the proper contact at the cutting faces 22, 23 will be secured. To hold the dies 20 rigid, they are each provided with a wedge shaped groove 26 at the end opposite the spherical surface, in which groove fits a

similarly formed wedge or washer 27. This washer 27 is provided with a key 28 which fits into a keyway 29 formed in the end 30 of the die carrier 5. This washer 27 is beveled from one side to the other as seen in Fig. 4, the bevel approaching the keyway, so that by simply reversing the insertion of the washer 27 in the keyway 29, the die 20 will be tilted in one or the other direction relatively to the bolt. In Fig. 4, it will be seen that the highest portion of the washer 27 is toward the outer end of the die carrier 5, while by reversing the washer, turning it through 180 degrees, the die would be oppositely tilted. By this simple reversal of the wedge and interchange of two dies, the dies are set to cover either right or left-hand threads.

To set the parts in rigid position, it is only necessary to tighten up nut 31 threaded on bolt 17, thereby drawing the bolt and the die toward the end 30 of die carrier 5, and frictionally clamping the die 20 between the spherical head 18 and the wedge shaped washer 27. In order to obviate turning of the bolt 17 and die when the nut 30 is screwed up, the head of the bolt is slotted, as at 32 (see Fig. 1) to receive keys 33, so as to engage the slots in the bolt heads and prevent them from turning. It will be seen that the wedge might be placed between the bolt head and the die, and the spherical surface formed on the carrier and secure the same tipping effect. The bolt is therefore considered a part of the carrier except as to its fastening function.

To enable the dies to be properly set, a gage plate may be used, having pins fitting into holes 34 in the die carriers, to insure that they will all be set on the same angle.

It will be seen that by this novel method of mounting round dies, they can be carried by cam operated radially movable die carriers sliding in suitable guides in the base 1, and can be rigidly set according to the desired adjustment for either right or left-hand threads. Where the angle of tip is to be changed, a different angle of wedge washer 27 will be used. It will be understood that these washers will be suitably marked as "L. H." and "R. H." so that when slipped into the keyways of the die carriers, they will correspondingly tip the dies.

The face plate 35 has guide grooves for the die carriers, and is preferably hinged to the base 1 as by hinge 36, guide pin 37 being provided to properly locate the face plate, and screws 38 hold the face plate rigidly to the base 1. To insure proper alinement and rigid positioning, registering lugs 39 are also provided, so that the face plate cannot move when once positioned and held.

As shown herein, the cams 8 are separate from the cam ring, but positively held there-

in by means of wedge blocks 40 and screws 41, so that the wedge blocks, when screwed up, tend to force the four cams outwardly so as to snugly fit the inner surface of the cam ring.

To facilitate proper setting of the dies, the cam ring and body will be provided with scales to indicate various diameters, as the cam ring is rotated by screw 11. It will be seen that as the dies are ground back, or sharpened, the diameters indicated by the scale will not be changed, as is the case with ordinary dies which have to be re-hobbed when dull or broken. Also, by reason of the circular teeth, one die can be ground independently of the others, and the teeth keep the positions predetermined by the washers or other equivalent tipping means.

In the form of the invention herein described, the pipe or rod to be threaded will be rotated while the die is fed by hand, but it will be seen that the invention is not restricted to this form of die stock, and is applicable to automatic machine dies, as well as in various other forms not necessary to be described herein. It will be seen that by the provision of guide grooves in both the base and in the cover, the die carriers can slide under control of the cams while still being held against lateral bending or springing.

Various modifications and changes in the form herein described may be made without departing from the scope of the appended claims.

Having thus described my invention, I declare that what I claim as new and desire to secure by Letters Patent is:—

1. In a die stock, the combination with a base, of die carriers, dies carried by said die carriers, and means comprising a reversible wedge for tipping said dies relatively to said die carriers.

2. In a die stock, the combination with a base, of die carriers, dies carried by said die carriers, and means comprising separable wedges interlocking with the die carriers for tipping said dies relatively to said die carriers in a predetermined direction.

3. In a die stock, a die carrier, a bolt carried by said carrier, a die mounted thereon and capable of tipping relatively thereto, and a separable wedge interposed between said die and said carrier and having a tongue and groove engagement with the carrier.

4. In a die stock, a die carrier, a bolt carried by said carrier, a die mounted thereon and capable of rotation and of tipping relatively thereto, and a wedge interposed between said die and said carrier and having a tongue and groove engagement with the carrier.

5. In a die stock, a die carrier comprising a forked block, a die carried thereby, and a bolt having a head engaging said die to clamp it against one of the forks of the

carrier, the other fork receiving and guiding said bolt head.

6. In a die stock, a die carrier, a bolt, a die on said bolt and capable of tipping relatively thereto, a wedge interlocked with said die and said bolt, and means for clamping the die, bolt and wedge to said carrier.

7. In a die stock, a die carrier, a die, reversible means for tipping the die, and means for clamping the die to the die carrier.

8. In a die stock, a die carrier, a die, a bolt attached to the die and to the carrier, and means comprising a separable and reversible wedge for tipping the die relatively to the carrier.

9. In a die stock, a die carrier, a die, a bolt attached to the die and to the carrier, and a reversible wedge for tipping the die relatively to the carrier.

10. In a die stock, a die carrier, a die, a bolt attached to the die and to the carrier, and a reversible wedge interlocking with the die and the carrier for tipping the die relatively to the carrier.

11. In a die stock, a die carrier, a die separably mounted thereon, means for tipping the die in predetermined opposite directions, and means for clamping the die to the carrier in each of said positions.

12. In a die stock, a die carrier, a die carried thereby, means comprising a separable and reversible wedge for tilting the die in opposite directions, and means for clamping the die in either tilted position.

13. In a die stock, a die carrier, a die having peripheral cutting teeth, means for clamping the die to the carrier against angular and bodily displacement, a wedge having fixed engagement with said carrier and frictional engagement with said die at one end, and clamping means for the die, wedge and carrier.

14. In a die stock, a die carrier compris-

ing a forked block, a die having peripheral teeth, a headed bolt passing through said die and the forks of said carrier, and a nut for clamping the die between the bolt head and the carrier.

15. In a die stock, a die carrier, tiltable dies having double cutting edges carried by said die carrier, fastening means, and means comprising a reversible wedge for tilting and setting said dies in opposite directions to cut opposite threads by said respective cutting edges.

16. The combination with a forked die carrier, of a headed bolt passing through the forks of said carrier, a die mounted on said bolt between the forks of said carrier, a nut on one end of said bolt and clamping the bolt and die to the carrier, and a separable wedge between the die and one of said forks, and interlocking with said forks for tipping the die.

17. In a die stock, the combination with a base of a plurality of radially movable die carriers, cam means for operating said die carriers, a cover plate having guiding means for said die carriers, means for registering and fastening said cover plate to said base, and dies carried by said carriers within said cover plate.

18. In a die stock, the combination with a radially movable die carrier, of a cylindrical die, fastening means passing through the carrier and the die, and means for effecting relative tipping between the bolt and die to provide the lead, said tipping means including cooperating spherical surfaces between the carrier and the die.

In testimony whereof I affix my signature in presence of two witnesses.

CARL P. ASTROM.

Witnesses:

J. S. WOOSTER,
GEO. N. KERR.