No. 689,658. Patented Dec. 24, 1901.

J. G. SPEAR.

THREAD CUTTING DIE.

(Application filed June 21, 1900.)

(No Model.) 3 Sheets—Sheet 1.

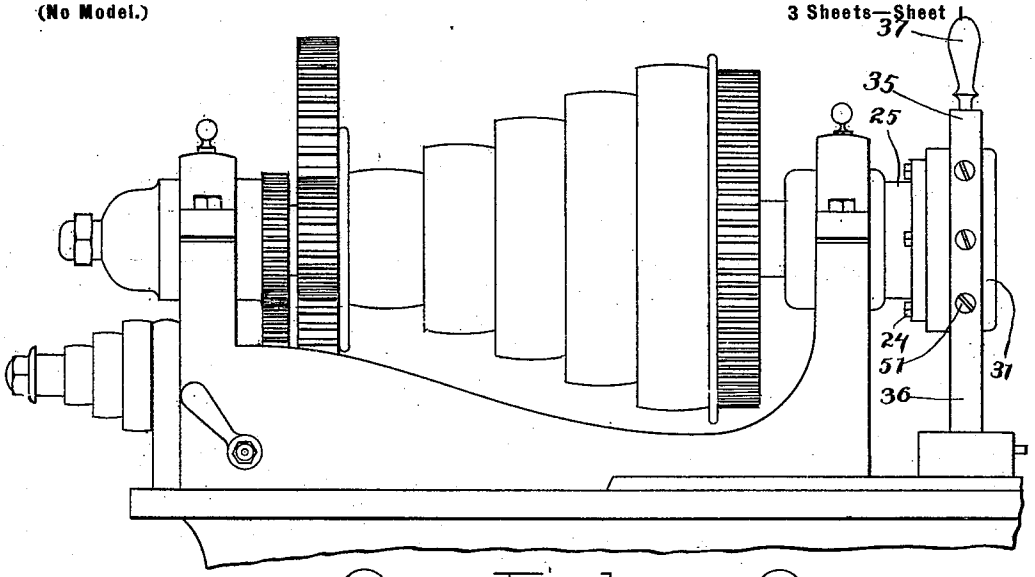


Fig. 1.

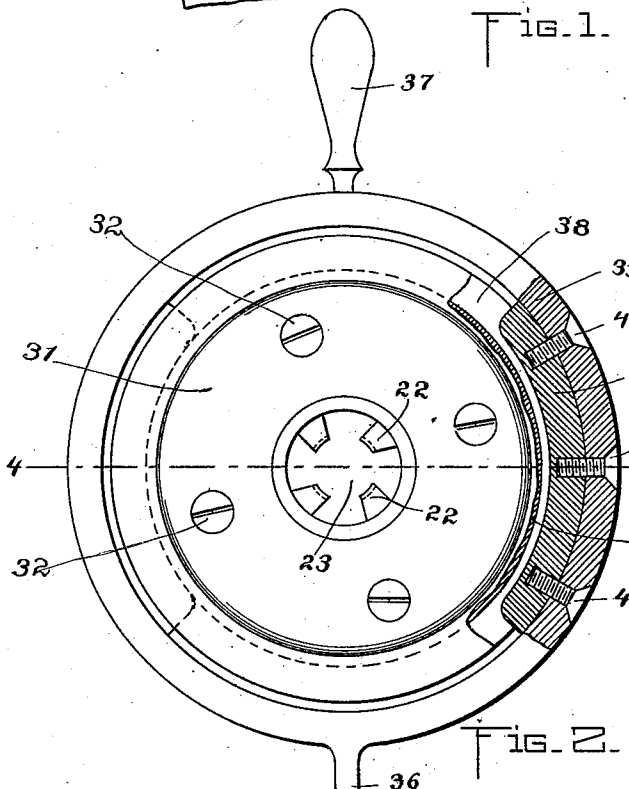


Fig. 2.

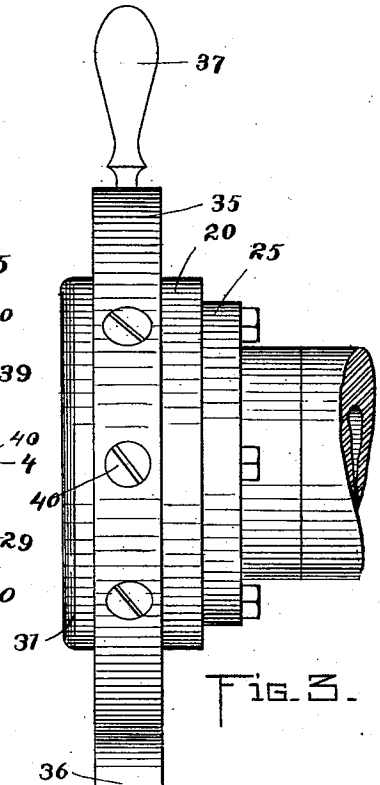


Fig. 3.

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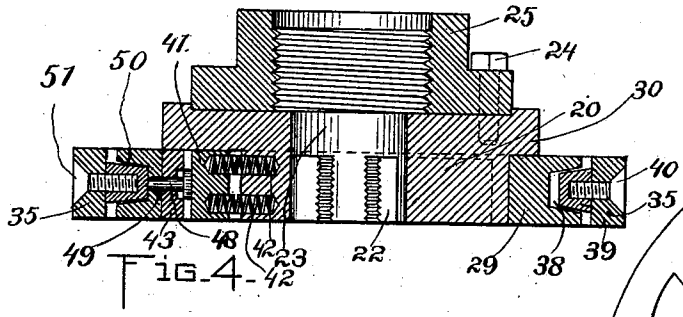


Fig. 4.

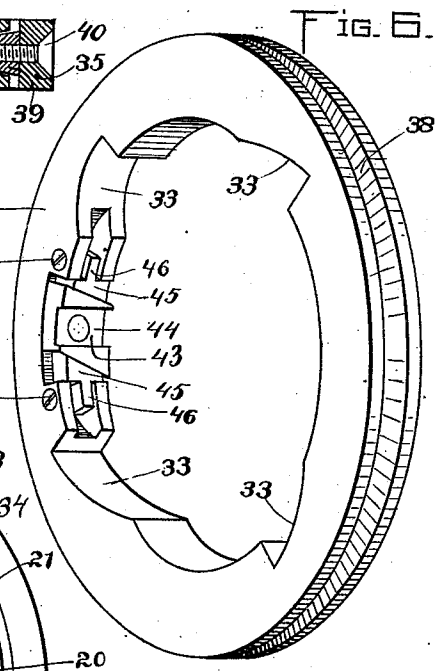


Fig. 6.

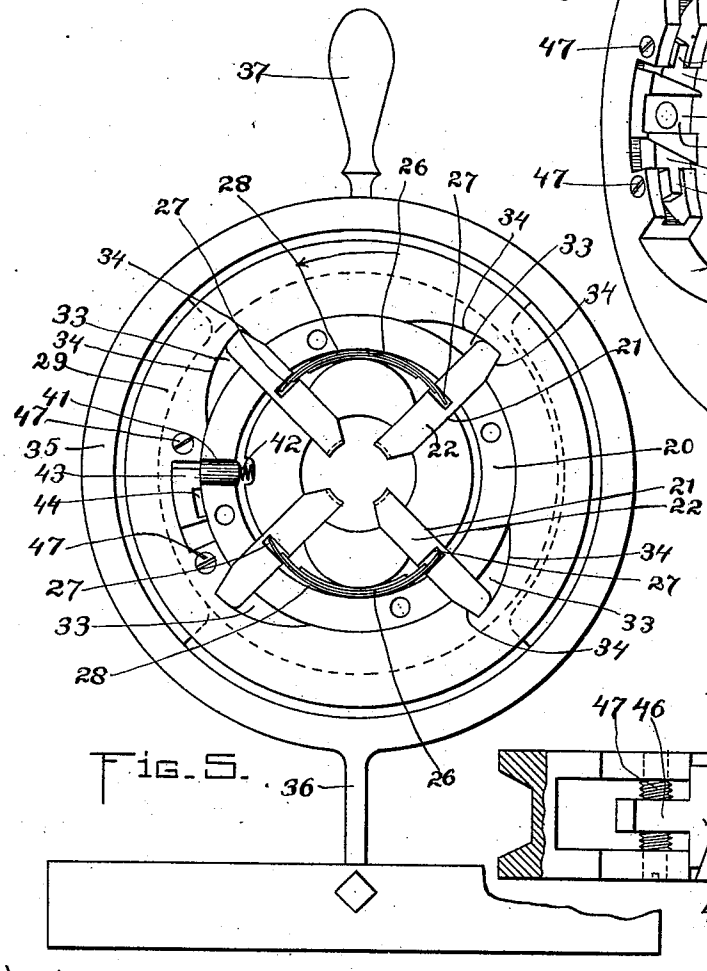


Fig. 5.

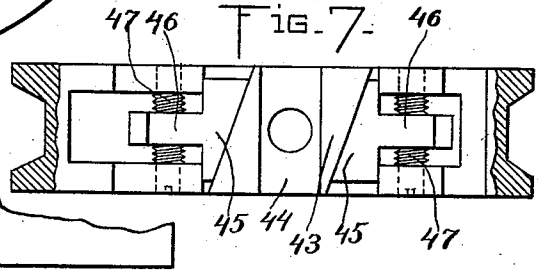


Fig. 7.

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No. 689,658. Patented Dec. 24, 1901.

J. G. SPEAR.

THREAD CUTTING DIE.

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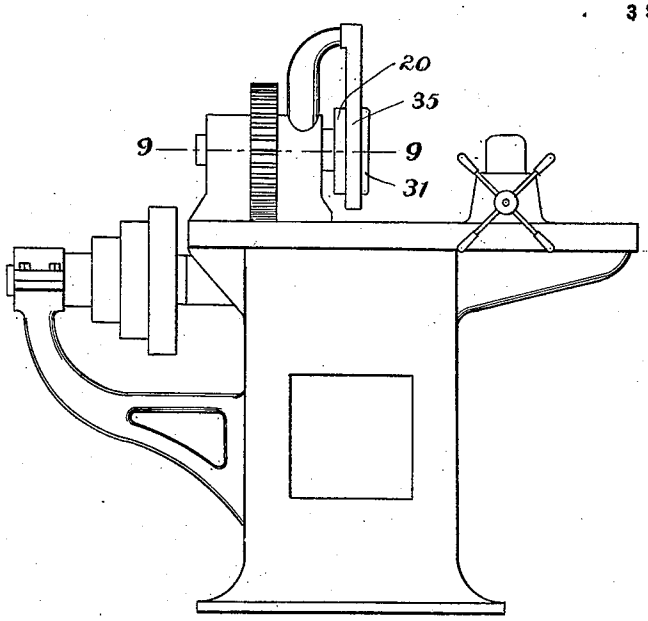


Fig. 8.

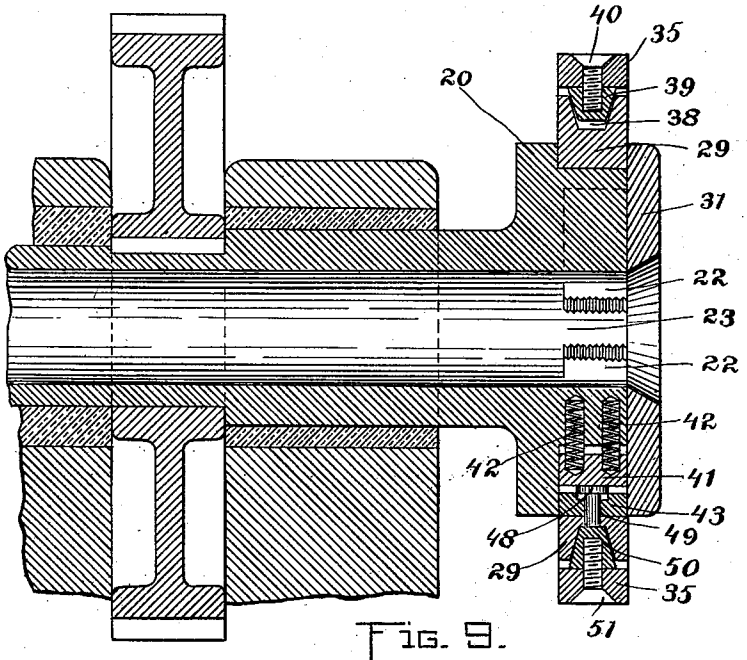


Fig. 9.

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UNITED STATES PATENT OFFICE.

JOHN G. SPEAR, OF WINSTED, CONNECTICUT.

THREAD-CUTTING DIE.

SPECIFICATION forming part of Letters Patent No. 689,658, dated December 24, 1901.

Application filed June 21, 1900. Serial No. 21,087. (No model.)

To all whom it may concern:

Be it known that I, JOHN G. SPEAR, of Winsted, in the county of Litchfield and State of Connecticut, have invented certain new and useful Improvements in Thread-Cutting Dies, of which the following is a specification.

This invention has relation to rotary thread-cutting dies, such as are employed on bolt-cutting machines or on engine-lathes.

The object of the invention is to provide certain improvements in the mechanism of the class referred to for moving the chaser-cutters into a predetermined operative position and securing them to operate on the work.

To this end the invention consists of a thread-cutting die comprising a plurality of chaser-cutters and a ring normally rotating with the cutters and having an internal cam-surface for engaging the ends of said cutters and moving them into operative relation to the work, and it also consists in novel means for effecting a movement of the said ring relatively to the cutters.

It further consists of mechanism capable of fine adjustment for locking the ring in a predetermined position with relation to the cutters and also devices for effecting the release of the cam-ring to permit its assuming its normal inoperative position.

Referring to the drawings, which represent the invention, Figure 1 illustrates in perspective view a portion of an engine-lathe to which the invention is shown as attached. Fig. 2 represents a front elevation of the die, a portion being broken away. Fig. 3 represents a side elevation of the same. Fig. 4 represents a section on the line 4 4 of Fig. 2. Fig. 5 represents a front elevation of the die with the front plate removed. Fig. 6 represents in perspective view the cam-ring. Fig. 7 is an enlarged view of the adjustable catch attached to the cam-ring and adapted to be engaged by a latch or lock on the die-body or cutter-support. Figs. 8 and 9 illustrate the invention as constituting a portion of the spindle of a bolt-cutting machine.

The invention comprises a die-body 20, having radial grooves 21 to receive the chaser-cutters 22. The die-body 20 may be formed, as in Fig. 4, with the central aperture 23 and secured by bolts 24 to a collar 25, adapted for attachment to the spindle of an engine-lathe, or else the said body may constitute a portion of the spindle itself, as illustrated in Fig. 9, where it is shown as forming a portion of the bolt-cutting machine. In the last-mentioned case it obviates the long overhang that is essential where a body is attached to the spindle by means of a collar. The ends of the chaser-cutters project beyond the periphery of the front portion of the body or support, and said cutters are normally held in inoperative position by powerful leaf-springs 26, which are arranged in slots in the front face of the die-body and have their ends projecting into apertures 27 in the chaser-cutters. It will be observed that the inner walls of the slots 28 in the die-body are so curved that said springs are free to have their ends move inward, while at the same time their middle portions fit snugly between the opposing walls of the slots.

Rotatively mounted upon the periphery of the die-body is a cam-ring 29, whose back face rests against a flange 30 on the die-body. The said cam-ring, as well as the chasers, is held against movement longitudinally of the axis of rotation of the die by means of a front plate 31, which is apertured at its center, as shown in Fig. 2, and is secured to the front face of the die-body by screws 32. The cam-ring is provided with a plurality of internal notches 33, into which the ends of the chaser-cutters project. The walls 34 of said notches are inclined to form cam-surfaces, which when the cam-ring is rotated with relation to the cutter-body cause the chaser-cutters to be wedged in toward the axis of rotation and into engagement with the work. The walls 34 of said notches provide stops against which the side edges adjacent the outer ends of the chaser-cutters may engage to limit the rotation of the cam-ring relatively to the die-body. The ring and the chaser-cutters lie in the same planes, and the walls 34 form abutments against which the ends of said cutters rest, whereby they are held rigidly against the work when operating.

In order to effect a movement of the cam-ring relatively to the die-body to cause a radial inward movement of the chaser-cutters, I employ friction mechanism, consisting of a ring 35, which loosely encircles the cam-ring

and is provided with a resilient stem or standard 36, supported at its lower end in the bed of the lathe or hung from a bracket, as in Figs. 8 and 9. To the upper portion of the ring is attached a handle 37, by means of which the ring may be swung to one side or the other relatively to the cam-ring, the resilient standard 36 returning the friction-ring to inoperative position after it is released by the operator. The cam-ring 29 is formed with a peripheral V-shaped groove 38, and to the inside of the friction-ring is attached a segmental friction-shoe 39 by means of screws 40, the said shoe being substantially wedge-shaped in section, as shown.

Assuming that the die-body and the cam-ring are rotating in the direction of the arrow in Fig. 5, it will be seen that by swinging the friction-ring to the left the segmental friction-shoe may be brought into frictional engagement with the cam-ring to retard its rotation, whereby the ends of the chaser-cutters ride against the cam-walls 34 of the notches 33 and are forced radially inward. Upon releasing the pressure of the shoe against the cam-ring the springs 26 force the chaser-cutters outward with a pressure sufficient to cause their ends to return the cam-ring to its initial inoperative position. Therefore I provide mechanism for locking the cam-ring after it has been moved into operative position. Said locking mechanism comprises a latch on the die-body and a catch adjustably secured to the cam-ring. The latch consists of a bolt 41, mounted in a radial slot in the face of the die-body and adapted to be thrust outward by tension-springs 42, placed in sockets, as shown in Fig. 4. The catch consists of a block 43, placed in a recess in the inner surface of the cam-ring and having a socket 44 to receive the bolt 41. The sides of the block are inclined or beveled in the same direction, and said block is held between two wedges 45 45. Each of said wedges has a lug 46, with a threaded aperture to receive a screw 47, whose ends are journaled in lugs in the cam-ring. The outer ends of the screws are provided with slots to receive a tool by which they may be rotated. By adjusting said wedges through the medium of the screws 47 the block 43 may be adjusted about the axis of the cam-ring. From this construction it is apparent that when the cam-ring is retarded by the friction device, previously referred to, the bolt 41 slips into the socket 44 and the cam-ring and die-body are locked together. To release the latch or bolt 41 from the catch, a pin 48 is passed radially through the block 43 and also through an elongated slot 49 in the cam-ring, and when the latch is engaged with the catch the said pin projects beyond the bottom surface of the groove in the cam-ring. Therefore to the inner surface of the friction-ring I attach a shoe 50 by means of screws 51, whereby the ring may be moved to the right in Fig. 5 to cause said shoe to engage the pin and thrust the bolt out from the socket in the block, and thereby permit the springs 26 to force the chaser-cutters outward and restore the cam-ring to an inoperative position. The shoe 50 is narrower than the groove in the cam-ring, as shown, and at its ends it is beveled to easily ride over the projecting end of the pin. When the friction-ring is in a central position, both shoes are inoperative, and hence said friction-ring may be swung to one side or the other to cause either of the shoes to perform its function, as occasion may require.

I have referred to the shoe-carrying member as a "friction-ring;" but it is apparent that the shape of the said member is immaterial, and, in fact, the two shoes may be mounted on separate members if desired, although for all general purposes the construction which I have illustrated is the best that has occurred to me.

Having thus explained the nature of the 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 declare that what I claim is—

1. A thread-cutting die comprising a freely-rotatable body, chaser-cutters supported thereby and rotatable therewith, an annular member supported on said body to rotate therewith but having a limited rotative movement relatively thereto, said member being operatively arranged with respect to said chaser-cutters to effect a movement of the latter to operative position when said annular member is retarded in rotation, an automatic lock for holding said member in its retarded position, and a friction device for retarding the rotation of said member, said friction device being normally disengaged from said member and being wedge-shaped to enter a complemental groove in said member.

2. A thread-cutting die comprising a freely-rotatable body, chaser-cutters supported thereby and rotatable therewith, an annular member supported on said body to rotate therewith but having a limited rotative movement relatively thereto, said member being operatively arranged with respect to said chaser-cutters to effect a movement of the latter to operative position when said annular member is retarded in rotation, a lock for holding said member in its retarded position, and oppositely-positioned means for alternately retarding the rotation of said member and releasing it from said lock.

3. A rotary thread-cutting die comprising a rotary body, chaser-cutters supported by said body, a cam-ring rotatably supported on said body for effecting a movement of said chaser-cutters to operative position, and having a circumferential V-shaped groove, a friction member having a complemental shoe to enter said groove and retard the rotation of the cam-ring, said shoe being normally disengaged from said ring.

4. A rotary thread-cutting die comprising

a rotary body, chaser-cutters supported by and rotatable with said body, a cam-ring rotatably supported on said body for effecting a movement of said chaser-cutters to operative position, an automatic lock for holding the cam-ring in operative position, operatively-positioned means for retarding the cam-ring to cause it to assume an operative position, operatively-positioned means for releasing the lock, means for automatically maintaining said retarding means and said releasing means inoperative except when positively actuated.

5. A thread-cutting die comprising a rotary body, chaser-cutters supported by said body, an operative ring rotatably supported on said body for effecting a movement of said chaser-cutters to operative position, a lock for holding the ring in operative position, and an upright spring-tensioned member having means for retarding the rotation of the ring, to cause it to assume an operative position and also having oppositely-positioned means for disengaging the lock from the ring to permit it to assume an inoperative position.

6. A thread-cutting die comprising a body, chaser-cutters supported by said body, a ring rotatably supported on said body for effecting a movement of said chaser-cutters to operative position, a lock for holding the ring in operative position, a laterally-movable non-rotary ring having a shoe for retarding the rotation of the ring and an oppositely-arranged shoe for disengaging the lock from the said ring.

7. A thread-cutting die having a body, chaser-cutters supported by said die, a ring having means for operating said chaser-cutters and rotatable with relation to said body, a latch carried by the said body, a catch-block carried by the ring and wedging means for adjusting said catch-block about the axis of said ring.

8. A thread-cutting die having a body, chaser-cutters supported by said die, a ring having means for operating said chaser-cutters and rotatable with relation to said body, a latch carried by the said body, a catch-block on said ring having oblique ends, and adjustable wedges engaging said ends for adjusting said catch-block.

9. A thread-cutting die comprising a unidirectionally rotatable body, chaser-cutters mounted on said body, mechanism for moving said chaser-cutters into operative position, friction mechanism for operating the cutter-moving mechanism, means for locking said last-mentioned mechanism when the chaser-cutters are in said last-mentioned position, a device for releasing the said mechanism and causing said chaser-cutters to be moved into inoperative position during the continued rotation of said body, said friction mechanism and said device being located in the same planes transverse to said thread-cutting die.

10. A rotary thread-cutting die, comprising a rotary body, cutters supported by and rotatable with said body, a ring carried by said body but movable relative thereto, and having provision for engaging said cutters to move the latter in one direction as the ring is turned relative to the body, frictional means for giving to said ring said relative movement, means for locking said ring in its operated position, and means for unlocking said ring, and springs arranged to oppose the movement of the cutters by the ring, whereby when the latter is unlocked the springs will automatically return the cutters and through them the ring to their initial position.

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

JOHN G. SPEAR.

Witnesses:
H. L. ROBBINS,
C. C. STECHER.