

May 31, 1960

Filed Nov. 6, 1958

B. G. BJALME
QUICK OPENING CAM OPERATED CHASER DIE
HEAD WITH THREAD SIZE SELECTOR MEANS

2,938,221

2 Sheets-Sheet 1

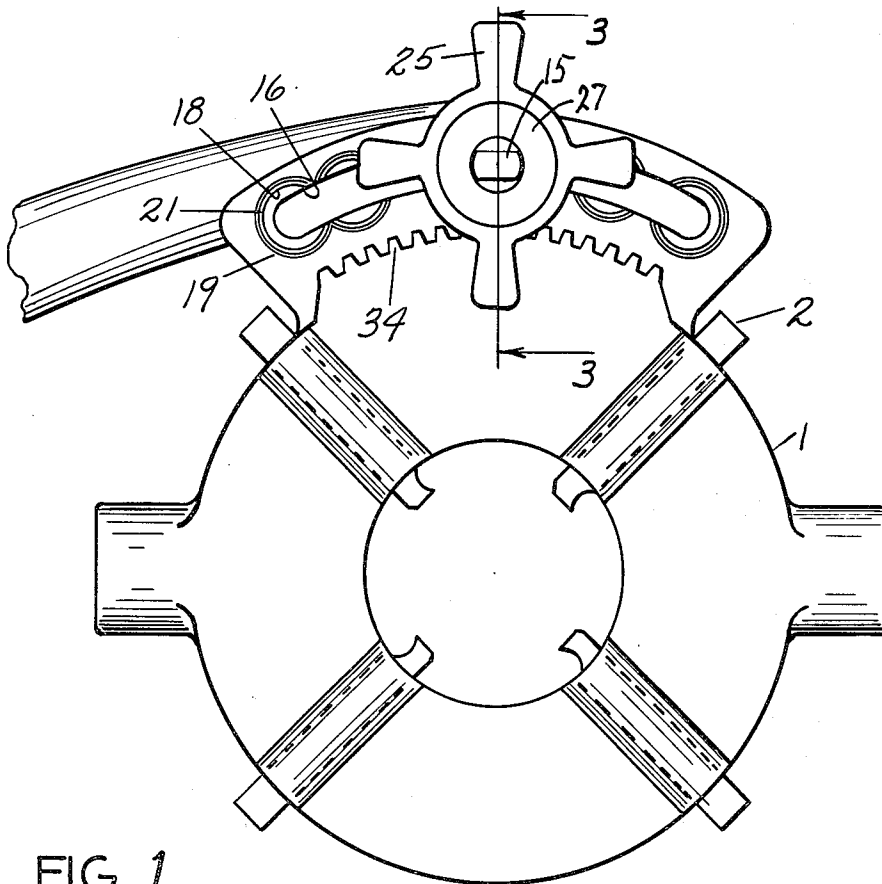


FIG. 1

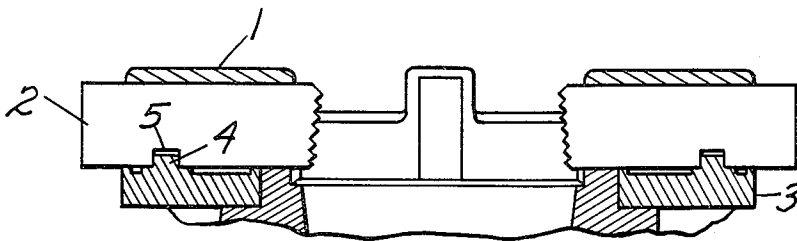


FIG. 2

INVENTOR.

BY *Bengt G. Bjälme*
Ralph Hammar
attorney

May 31, 1960

B. G. BJALME
QUICK OPENING CAM OPERATED CHASER DIE
HEAD WITH THREAD SIZE SELECTOR MEANS

2,938,221

Filed Nov. 6, 1958

2 Sheets-Sheet 2

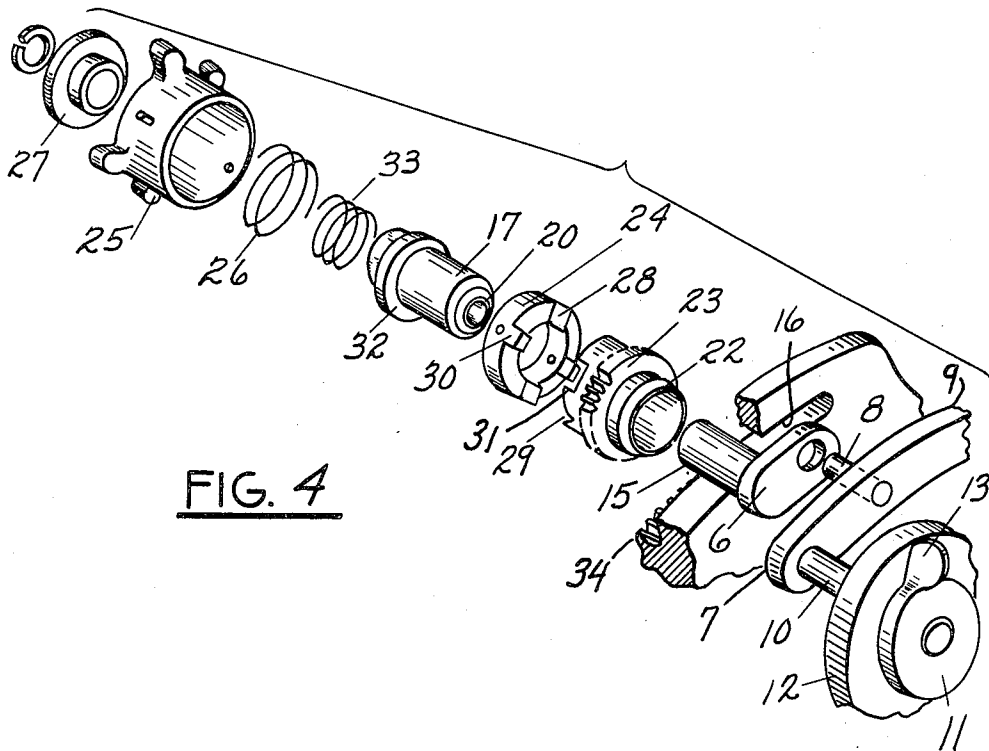


FIG. 4

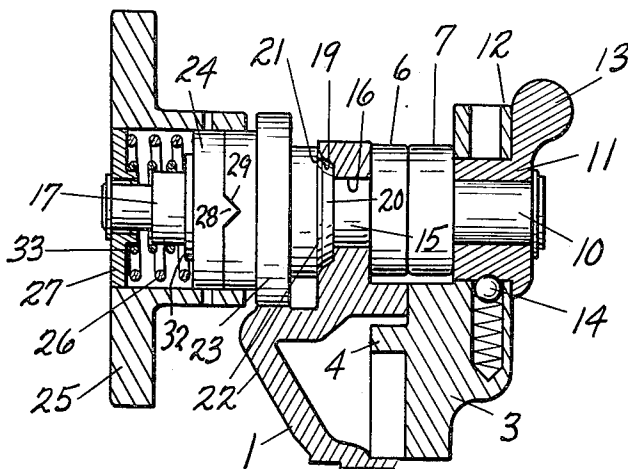


FIG. 3

INVENTOR.
Bengt G. Bjälme
BY *Ralph Hammer*
Attorney

1

2,938,221

QUICK OPENING CAM OPERATED CHASER DIE HEAD WITH THREAD SIZE SELECTOR MEANS

Bengt G. Bjalme, Erie, Pa., assignor to Reed Manufacturing Company, Erie, Pa., a corporation of Pennsylvania

Filed Nov. 6, 1958, Ser. No. 772,206

5 Claims. (Cl. 10—96)

This invention is a threader which is readily adjustable to a new size. By merely turning a handle, the threader snaps into each position corresponding to the new size. A new size can accordingly be selected by feel.

In the drawing, Fig. 1 is a front view of the threader; Fig. 2 is an edge view partly in section; Fig. 3 is a section on line 3—3 of Fig. 1; and Fig. 4 is an exploded view.

The conventional parts of the threader are readily identified, 1 being the frame holding radially slidable chasers 2, and 3 being a scroll plate journaled on the frame and having spirally directed cam elements 4 fitting in notches 5 in the chasers and moving the chasers radially as the scroll plate is rotated on the frame. At the end of each threading operation, the chasers are moved outward clear of the work by toggle links 6 and 7 pivoted to each other at 8 and movable between a folded position in which the die is closed and an extended position in which the die is open. In both the folded and extended position, the toggle links 6 and 7 are in a stable position substantially in line with each other and in a direction tangential to an arc centered on the axis of the threader. The toggle links are moved between open and closed positions by a handle 9 integral with the toggle link 7.

The toggle link 7 has fixed thereto a pin 10 journaled in an eccentric 11 rotatably carried in an ear 12 on the scroll plate 3. The eccentric is rotatable by a handle 13 and is held in any one of a plurality of selected positions by a detent 14. The purpose of the eccentric 11 is to provide small amounts of movement of the scroll plate 3 relative to the frame desirable for cutting threads which are slightly over size or slightly under size. The position of the handle 13 provides an indication of the amount of over or under size adjustment of the eccentric 11.

The toggle link 6 has fixed thereto a pin 15 slidably extending through a slot 16 in the frame 1 and journaled in a plunger or bushing 17 which forms part of a thread size selector mechanism hereafter described. At any selected thread size, the bushing 17 is located in one of the detent recesses 18 spaced along the slot 16. Each detent recess 18 provides accurate positioning of the chasers for a size of thread to be cut. There is no element of guess work or judgment involved because the bushing 17 can only be stopped in one of the detent recesses 18. When the bushing 17 is so located, it is fixed with respect to the frame 1 and provides a rigid pivot for the pin 15 journaled in the bushing.

Each of the recesses 18 which determine a size of thread consists of a deep, slightly tapered, positive locking section 19 receiving the complementary tapered end 20 of the bushing 17 and a shallow cam section 21 for receiving a complementary section 22 integral with a pinion 23. The section 19 provides a positive stop for the bushing 17. The cam section 21 provides a yielding detent for the pinion 23. Since the bushing 17 and the pinion 23 are in telescoping relation to each other and to

2

the pin 15, both the bushing 17 and the pinion 23 serve to locate the pin 15 along the slot 16. The bushing 17 positively locates the pin 15 while the pinion 23 yieldably locates the pin 15.

In order to move the pin 15 to a position corresponding to a different thread size, the first step is to withdraw the tapered end 20 of the bushing 17 from the locking recess 19. This is effected by a clutch member 24 pinned to a handle 25 and slidably mounted on the outer end of the bushing 17. The handle is urged to the right as viewed in Fig. 3 by a coil spring 26 arranged between the clutch member 24 and a thrust washer 27 fixed to the left hand end of the pivot pin 15. The spring 26 normally holds diametrically opposed wedge shaped teeth 28 on the clutch member seated in complementary tapered recesses 29 in the pinion 23. In this position, clutch teeth 30 on the clutch member are received midway between the sides of relatively wide slots 31 in the pinion. As the handle 25 is turned in either direction, the wedge shaped teeth 28 cooperate with the tapered recesses 29 to cam the clutch member 24 to the left as viewed in Fig. 3. This movement of the clutch member is transmitted to the bushing 17 through a shoulder 32 and is sufficient to withdraw the tapered end 20 of the bushing from the recess 19. At this point the tapered clutch teeth 28 are still partially engaged in the recesses 29 and the clutch teeth 30 have taken up the lost motion in the clutch recesses 31 and now rest against one side of the recesses. The withdrawal of the bushing from the locking recess 19 is resisted by a coil spring 33 arranged between the thrust washer 27 and the other side of the collar 32.

When the tapered end 20 of the bushing 17 is withdrawn from the locking recess 19, the only remaining force exerted to hold the pin is from the engagement with the cam projection 22 on the pinion 23 with the shallow cam detent recess 21. This offers relatively slight restraint so that further turning of the handle 25 cams the projection 22 out of recess 21 and rotates the pinion 23 to move it along the slot 16 by reason of the engagement of the pinion with a rack 34 integral with the frame 1. When the pinion 23 reaches a position corresponding to the next size of thread, the spring 26 forces the pinion to the right as viewed in Fig. 3 and snaps it into the detent recess 21 with a click which informs the operator that the threader has been adjusted for the next size of thread. If still further change of size of thread is desired, the rotation of the handle 25 is continued. Upon releasing the handle at the desired adjustment, the spring 33 moves the bushing 17 to the right causing its tapered end 20 to enter the locking recess 19. This movement of the bushing 17 is accompanied by a slight reverse rotation of the handle as the tapered clutch teeth 28 center in the recesses 29 and the clutch teeth 30 center in the clutch recesses 31.

The use of the threader eliminates entirely the element of judgment of the operator. The size of thread is selected by turning the handle 25 and at each position there is a click as the projection 22 on the pinion 23 snaps into the recess 21 which informs the operator that the threader has been adjusted. Upon release of the handle 25, the threader is then positively locked in the adjusted position. The cutting of over or under size threads is controlled by handle 13 which in conjunction with a detent 14 provides controlled steps of over or under size. Both the thread size selection and the over or under size adjustment are determined by the construction and are independent of the judgment of the operator. Each thread size has a recess 18 containing the locking surface 19 and the detent surface 21 and is positioned at the point of manufacture so as to correspond accurately to the thread size. This results in uniformly accurate adjust-

3

ment of the threader for the selected thread size. Similarly, the handle 13 and its detent 14 for controlling or adjusting the amount of over or under size of the thread to be cut is determined in the manufacture.

What is claimed as new is:

1. In a pipe threader having a frame carrying radially movable chasers and a scroll plate journaled on the frame, the frame and plate comprising members which are relatively movable to move the chasers radially, a thread size selector for positioning said members in relative positions corresponding to the size of thread to be cut, one of the members having a fixed connection to the thread size selector, the thread size selector having a rotatable handle, a pinion rotated by the handle through a lost motion connection, a rack on the other of the members with which the pinion meshes for moving the thread size selector along the rack as the handle is turned, a plurality of detent structures on the other member spaced along the rack each corresponding to a different size of thread, said detent structures including cam detent structure engageable by the pinion and positive detent structure engageable by the plunger, spring means urging the pinion and plunger into engagement with the cooperating detent structure, and cam means for retracting the plunger from the positive detent structure while the lost motion between the handle and pinion is being taken up.

2. In a pipe threader having a frame carrying radially movable chasers and a scroll plate journaled on the frame, the frame and plate comprising members which are relatively movable to move the chasers radially, a thread size selector for positioning said members in relative positions corresponding to the size of thread to be cut, one of the members having a fixed connection to the thread size selector, the thread size selector having a rotatable handle, a pinion rotated by the handle, a rack on the other of the members with which the pinion meshes for moving the thread size selector along the rack as the handle is turned, the other member having a plurality of recesses spaced along the rack and each corresponding to a different size of thread, a plunger on the thread size selector successively coming into register with and engageable with said recesses as it is moved along the rack, spring means urging the plunger toward said recesses, and means for camming the plunger out of said recesses as the handle is turned.

3. In a pipe threader having a frame carrying radially movable chasers and a scroll plate journaled on the frame, the frame and plate comprising members which are relatively movable to move the chasers radially, a thread size selector for positioning said members in relative positions corresponding to the size of thread to be cut, one of the members having a fixed connection to the thread size selector, the thread size selector having a rotatable handle, a pinion rotated by the handle, a rack on the other of the members with which the pinion meshes for moving the thread size selector along the rack as the handle is turned, a plurality of detent structures on the other member spaced along the rack each corresponding to a different size of thread, and cooperating detent structure on the thread size selector engageable with the detent structures on the other member at each thread size and when engaged providing a positive

4

lock for the thread size selector, cam means rotated by the handle for initially unlocking the cooperating detent structure to permit movement of the thread size selector by the pinion, and means biasing the cooperating detent structure to the locked position whereby it snaps into the locked position upon reaching a succeeding thread size.

4. In a pipe threader having a frame carrying radially movable chasers and a scroll plate journaled on the frame, the frame and plate comprising members which are relatively movable to move the chasers radially, a thread size selector for positioning said members in relative positions corresponding to the size of thread to be cut and including toggle links for relatively moving the members in any thread size position to open and close the die, one of the members having a fixed connection to the thread size selector, the thread size selector having a rotatable handle, a pinion rotated by the handle, a rack on the other of the members with which the pinion meshes for moving the thread size selector along the rack as the handle is turned, the other member having a plurality of detent structures spaced along the rack each corresponding to a different size of thread and successively coming into register with and engageable by the thread size selector as it is moved along the rack, means for disengaging the thread size selector from the detent structure to permit movement of the thread size selector to a different thread size position, and means for engaging the thread size selector with any of the detent structure with which the thread size selector comes into register.

5. In a pipe threader having a frame carrying radially movable chasers and a scroll plate journaled on the frame, the frame and plate comprising members which are relatively movable to move the chasers radially, a thread size selector for positioning said members in any one of a plurality of positions each corresponding to a different size of thread to be cut and including toggle links for relatively moving the members in any thread size position to open and close the die, one of the members having a pivot for one of the toggle links, the other of the members having a slot slidably receiving a pivot pin for the other of the toggle links, a plurality of detent recesses spaced along the slot and each corresponding to a different thread size, the thread size selector having a rotatable handle, a pinion in telescoping relation to the pin and rotated by the handle, said pinion having a part engageable with said detent recesses to yieldably hold the pin from movement along the slot, a plunger in telescoping relation to the pin having a part engageable with said detent recesses to positively hold the pin from movement along the slot, a rack on the other of the members with which the pinion meshes for moving said pin along the slot as the handle is turned, and means actuated by initial turning of the handle for moving the plunger out of locking relation to permit movement of the pin along the slot.

References Cited in the file of this patent

UNITED STATES PATENTS

1,586,139	Bivins	May 25, 1926
2,645,021	Dierkes	July 14, 1953
2,680,256	Ingwer	June 8, 1954