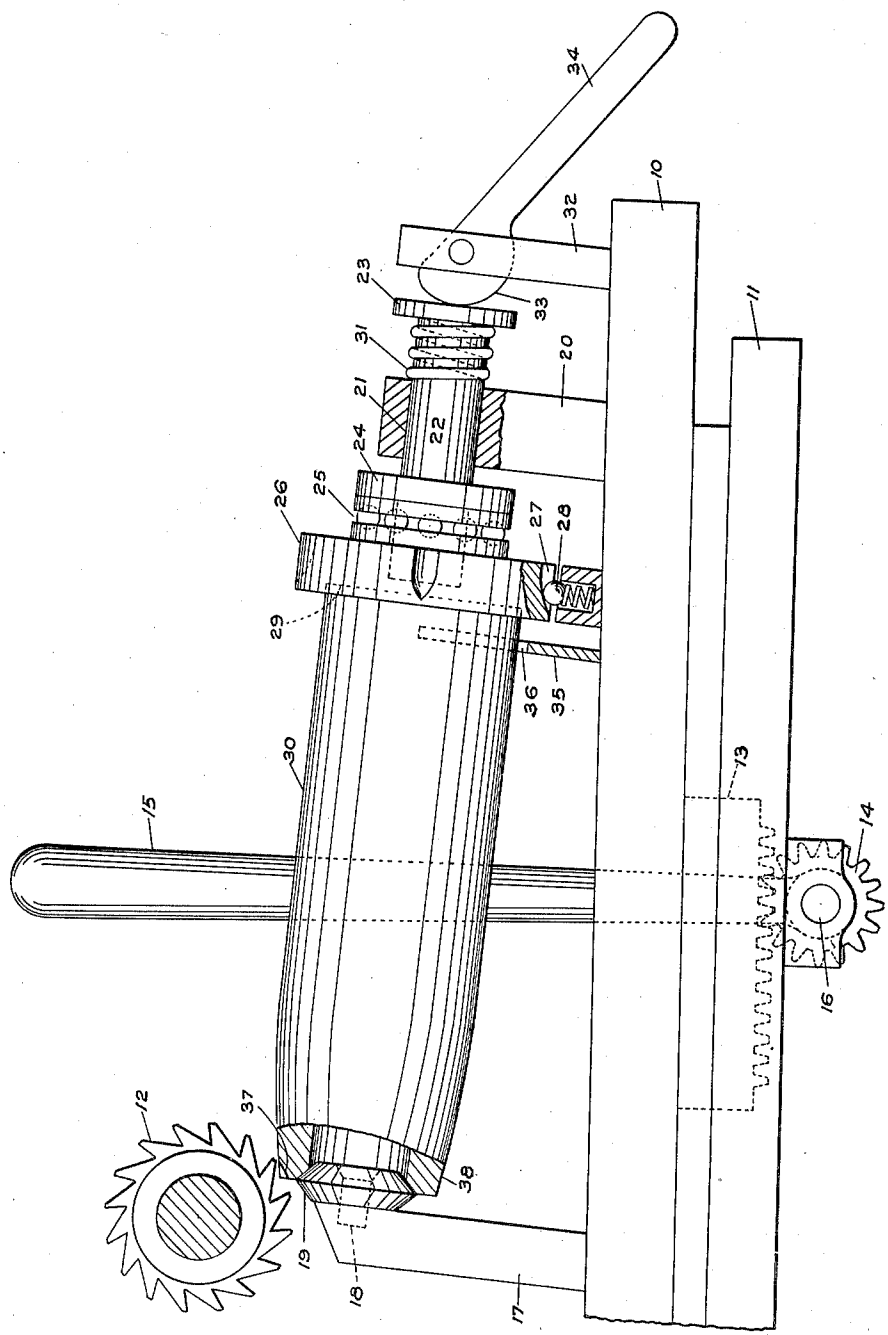
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INDEXING DEVICE

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INDEXING DEVICE

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The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates to an indexing device for use in cutting staking notches in the noses of projectiles to be armed with point fuses or similar elements.

It is an object of this invention to provide a simple and economical indexing device that may be used to rapidly and accurately position a projectile disposed for rotation about its longitudinal axis in desired positions of rotation corresponding to predetermined positions of staking notches to be formed in the nose of the projectile.

The specific nature of the invention as well as other objects and advantages thereof will clearly appear from a description of a preferred embodiment as shown in the accompanying drawing in which:

The single figure of the drawing is a side elevation of the indexing device of this invention partially in section.

As shown in the drawing the indexing device comprises a base member 10 adapted to be secured to the bed plate 11 of a milling machine for predetermined limited reciprocal movement thereon in opposite directions in the plane of a high speed milling cutter 12. Although many expedients may be used to reciprocate the base member 10 relative to the cutter 12 it has been found convenient to secure a rack 13 to the under side of the base in mesh with a pinion 14 rotatably mounted on the bed plate 11 and manually operable through the lever 15 and shaft 16.

Adjacent the forward portion of the base 10 is secured in any suitable manner an upwardly extending standard 17 provided near its upper terminal with a pivot pin 18 having a beveled guide bearing 19 rotatably mounted thereon to rotate in a plane normal to the plane of rotation of the milling cutter 12 and adapted to be inserted in the machined nose of a projectile. In predetermined spaced relation of standard 17 longitudinally of the base 10 a second standard 20 is secured to the base and adjacent its upper terminal it is bored to provide a bearing 21 in co-axial alignment with the axis of bearing 19.

A stub shaft 22 is mounted in the bearing 21 intermediate its ends for sliding movement and is formed to provide or has secured thereto on its end remote from standard 17 a flange 23. Intermediate the portion of the stub shaft projecting from the standard 20 opposite flange 23 the shaft is provided with an abutment 24 and a thrust bearing 25 is mounted on the stub shaft in engaging relation with the side of the abutment remote from standard 20. Freely rotatably mounted on the free end of the stub shaft in engagement with the thrust bearing 25 is a generally circular index member 26 having peripheral index notches 27 circumferentially spaced in accordance with the number and spacing of the staking notches required. As shown at 28 a resiliently loaded detent is adapted to engage in any of the notches 27 to normally restrain the index member against rotation, however, the detent and notches are so arranged that the restraining action of the detent may be overcome by the manual application of a small torque on the index member as is well understood in the art. The front face of the index member is suitably roughened or provided with an insert indicated at 29 having a relatively high coefficient of friction with respect to the base of a projectile 30 for a purpose hereinafter described and may be recessed to accommodate the base of the projectile and facilitate alignment thereof on its supports for axial rotation. A compression spring 31 is sleeved on the stub shaft 22 and interposed between the flange 23 and standard 20 under sufficient initial compression to bias the stub shaft 22 and index member 26 away from the base of the projectile 30 interposed between the bearing 19 and index member and with abutment 24 engaging standard 20.

In spaced relation with standard 20 a support 32 is secured to the base 10 and has pivotally mounted thereon an eccentric 33 disposed to cam the stub shaft and index member 26 toward the standard 17. The eccentric is manually operable by the lever 34 and is so arranged that in the lowermost position of the lever the thrust on the eccentric surface due to the spring 31 will be out of line with the eccentric pivot and exert a turning movement on the lever 34 in such direction as to restrain it in its lowermost position in engagement with a suitable stop on the support 32 or base 10.

A stationary guide 35 is secured to base 10 between the standard 17 and index member 26 adjacent the normal position of the base of the projectile 30 and is provided with a V-shaped cut-away section 36 adapted to engage the base of the projectile on opposed sides in such manner as to align the axis of the projectile with the axis of bearing 19 and stub shaft 22.

As shown in the drawing the standards 17, 20 and guide 35 may be disposed in inclined par-

allel relation so as to incline the axis of the projectile to predetermine the depth of the staking notch 37 cut in the nose 38 of the projectile 30 for a given length of cut.

In operation a projectile 30 having passed through the prior necessary machine operations, which will include machining of the fuse seat in the nose, will be positioned in the index device with its nose bearing in the rotatable guide 19 and its base resting in the V-cut 36 of the stationary guide 35 whereby its longitudinal axis will be aligned with the axis of rotation of rotatable guide 19 and stub shaft 22. The eccentric lever 34 will be depressed bringing the friction surface 29 of the index member 26 into frictional engagement with the base of the projectile 30 and if detent 28 is not in engagement with a notch 27 of the index member the projectile, guide 19 and index will be rotated as a unit until detent 28 engages in a notch 27. The projectile is now secured between the guide 19 and index member 26 for rotation therewith and properly positioned with respect to the cutter 12 to have the first staking notch cut in its nose. The lever 15 is now depressed to rotate the pinion 14 and translate base member 10 through the rack 13 to a position where the high speed milling cutter 12 will engage and cut the first staking notch 37 in the nose 38 of the projectile 30. After the first staking notch is cut the lever 15 is retracted to draw the nose of the projectile from withunder the cutter 12 and the projectile is manually rotated on its axis until the next notch 27 of the index member is engaged by the detent 28 whereafter the sequence of operations above enumerated are repeated until the requisite number of staking notches have been cut.

Having now particularly described my invention in its present preferred embodiment, what I claim as new and desire to secure by Letters Patent is:

1. In an indexing device in combination, a base member, a pair of spaced standards secured to the base member, a rotatable guide bearing mounted on one of said standards, a rotatable index member mounted on the other of said standards in coaxial alignment with said rotatable guide bearing, means for displacing the index member axially toward and away from said rotatable guide bearing and for restraining the index member in displaced position, and a detent cooperable with said index member to normally restrain the index member in one of a plurality of selectable positions.

2. In an indexing device for use in cutting staking notches in the nose of a projectile in combination, a base member, a pair of spaced standards secured to the base member a rotatable guide bearing for supporting the nose of a projectile to be rotated on its longitudinal axis mounted on one of said standards, a rotatable and shell supporting index member adapted to support the base of said projectile mounted for co-axial rotation with said rotatable guide bearing on the other of said standards, eccentric means for displacing said index member toward the rotatable guide bearing to engage the base of a projectile and secure it to said rotatable guide bearing, and a detent cooperable with said index to normally restrain the index member in one of a plurality of spaced selectable positions.

3. In an indexing device in combination, a standard, a rotatable guide bearing mounted on the standard, a second standard disposed in spaced relation to the first stanard formed to provide a bearing in axial alignment with the rotatable guide bearing, a stub shaft journaled in the bearing in the second standard, said shaft being provided with a flange on its end remote from the first standard and with an abutment adjacent its end remote from the flange, resilient means interposed between the flange and second standard biasing the shaft to a position with its abutment engaging the second standard, a thrust bearing mounted on the stub shaft in engagement with the abutment, an index member freely rotatably mounted on the stub shaft in engagement with the thrust bearing, an eccentric mounted adjacent the flange and having a cam surface engaging the flange so disposed as to displace the shaft and index member toward the rotatable guide upon movement of the cam surface relative to the flange, means for moving the cam surface and automatically restraining the eccentric in flange displacing position, and means for selectively positioning and restraining the index member in rotation.

4. The structure of claim 3 wherein a stationary guide is disposed between the rotatable guide bearing and index member adjacent the latter for aligning an element to be secured between the guide and index member for rotation.

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