July 13, 1926. 1,592,700

R. K. McDOUGAL

INDEX HEAD

Filed April 24, 1925 2 Sheets-Sheet 1

Fig. 1.

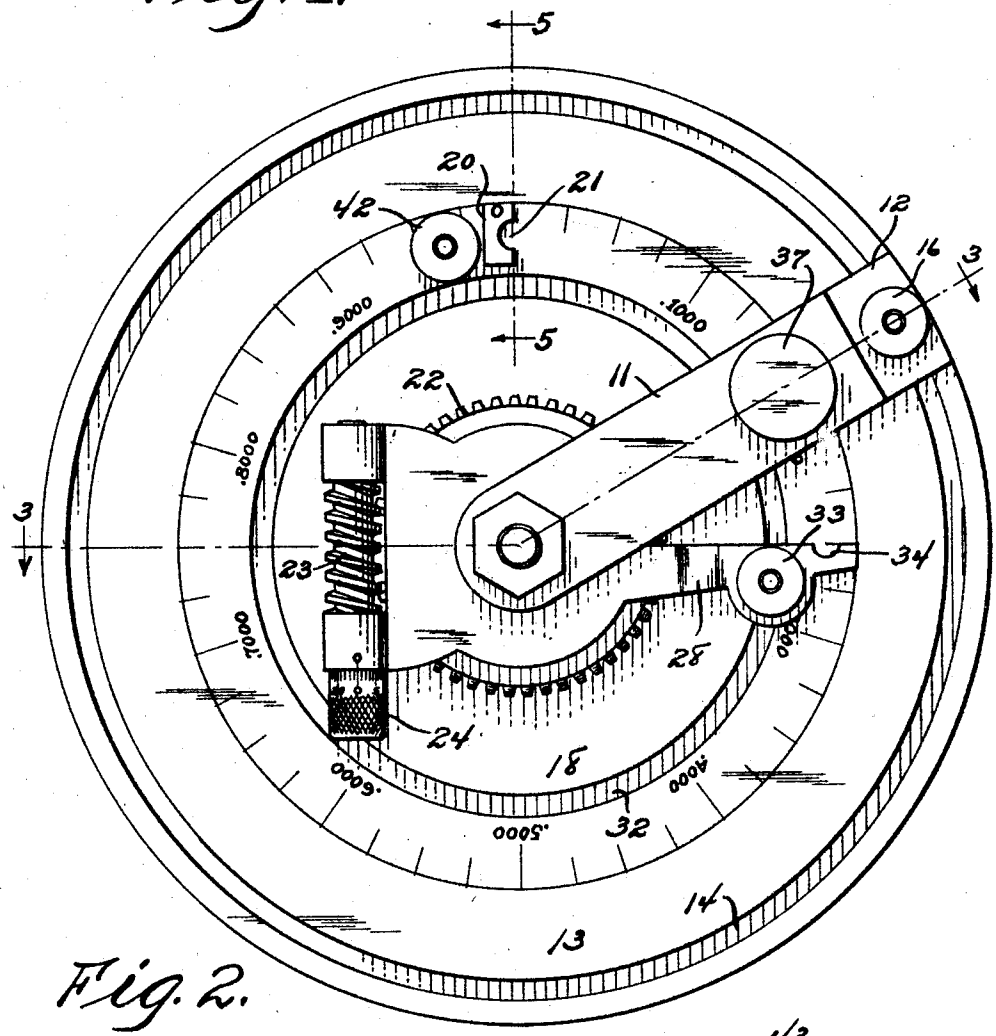


Fig. 2.

43

MICROMETER INDEX CHART F

THE RECIPROCAL OF ANY NUMBER MULTIPLIED BY 40 = DECIMAL TO BE USED TO 5

NUMBER OF TEETH	NUMBER OF TURNS PLUS OR MINUS DECIMAL	NUMBER OF TEETH	NUMBER OF TURNS PLUS OR MINUS DECIMAL	NUMBER OF TEETH	NUMBER OF TURNS PLUS O
2	20.	51	.78431	101	
3	13.+.33333	52	.76923		
4					

R. K. McDougal
INVENTOR

BY Victor J. Evans
ATTORNEY

WITNESS: [illegible]

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Filed April 24, 1925 2 Sheets-Sheet 2

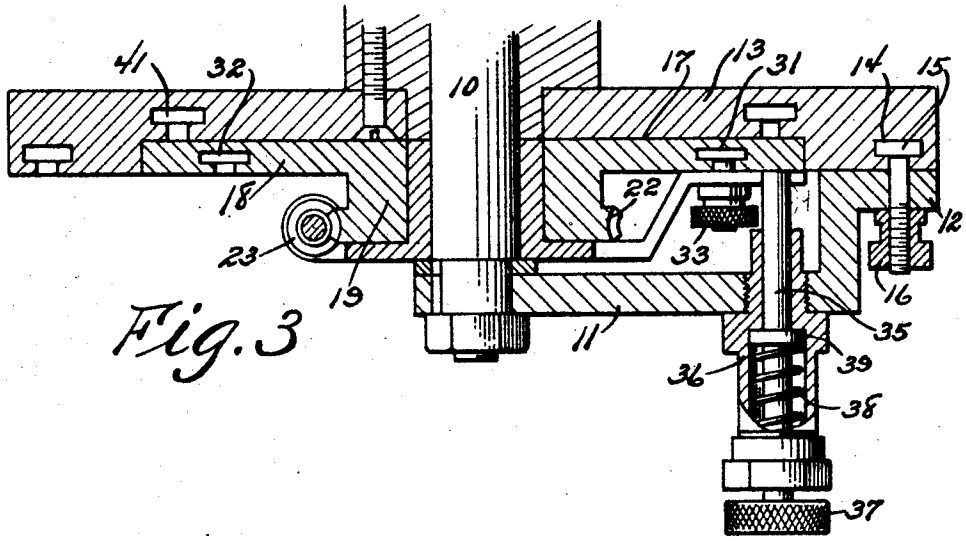


Fig. 3

Fig. 4

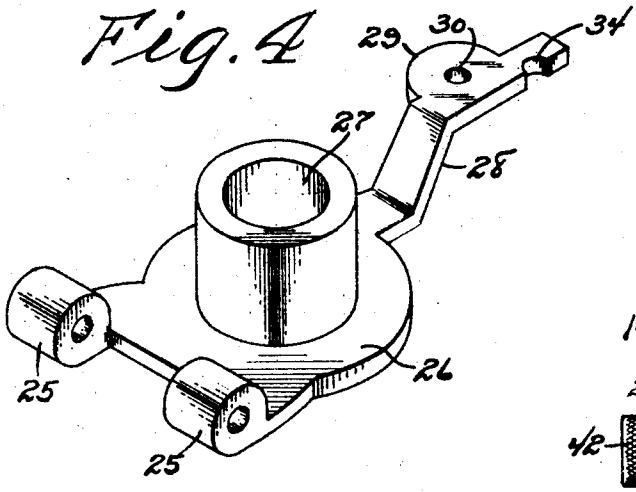
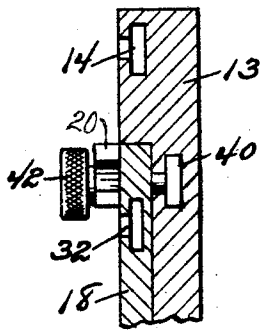


Fig. 5.



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Patented July 13, 1926. 1,592,700

UNITED STATES PATENT OFFICE.

ROYDEN K. McDOUGAL, OF BOISE, IDAHO.

INDEX HEAD.

Application filed April 24, 1925. Serial No. 25,679.

This invention contemplates the provision of an index head, for milling machines or the like, and resides in the novel construction, combination and arrangement of parts as claimed.

In the drawings forming part of this application, like numerals of reference indicate similar parts in the several views, and wherein:

Figure 1 is a front elevation of the invention.

Figure 2 is a fragmentary view of the index chart.

Figure 3 is a sectional view on line 3—3 of Figure 1.

Figure 4 is a perspective view of the index finger and supporting plate therefore.

Figure 5 is a sectional view on line 5—5 of Figure 1.

Referring to the drawings in detail, 10 indicates a rotatable shaft mounted on the indexing head to be presently described, the shaft being rotated through the instrumentality of a handle 11 which has an offset extremity 12 as clearly shown in Figure 3.

The indexing head forming the subject matter of the present invention comprises a stationary disk 13 which is formed with an annular slot 14 to receive the head 15 of a T-bolt which is passed through an opening in the offset extremity 12 of said handle and equipped with a nut 16, which when tightened holds the handle 11 fixed with relation to the stationary disk for a purpose to be presently described. The front of the disk 13 is provided with an annular recess 17 which receives a rotatable disk 18 the hub of which is indicated at 19. The disk 18 is graduated about its edge in thousandths as clearly illustrated in Figure 1, and is provided with a stop member 20 at zero which stop member is notched as at 21. The hub 19 of this disk is provided with a worm gear 22 which meshes with the gear 23 which is rotated through the instrumentality of a micrometer head or thimble 24 which is graduated so that the total ratio between the shaft 10 and each space on the thimble is one thousand to one. It might here be stated that the gear ratio between the gears 22 and 23 respectively may vary but is preferably a forty to one ratio. The gear 23 is journalled in spaced bearings 25 projecting from one end of a substantially disk like supporting plate 26 which has a central opening 27 to receive the adjacent end of the shaft 10, being arranged in face to face contact with the hub 19 of the rotatable disk 18. Projecting from the periphery of the supporting plate 26 at a point directly opposite from the bearings 25 is an angular shaped index finger 28 which has offset extremities 29 adapted to bear against the outer face of the disk 18 to cooperate with the graduations thereon in a manner and for a purpose to be presently described. This extremity 29 is provided with an opening 30 to receive the shank of a T-bolt, the head 31 of which is adapted to operate in a similar shaped annular slot 32 formed in the disk 18, while the shank of this bolt is provided with a nut 33 which when tightened holds the index finger fixed with relation to the disk 18, for rotation therewith when the micrometer head or thimble 24 is rotated. This index finger is also formed with a notch or groove 34 to cooperate with a spring rod 35 supported for sliding movement on a handle 11 and at a right angle thereto. The handle supports a tubular housing or casing 36 which is preferably threaded in an opening formed in said handle, and which housing receives the rod 35, the latter projecting through the end of the housing and equipped with a knob 37. The spring 38 is arranged within this housing and cooperates with one end of the latter and a shoulder 39 formed on the rod to normally hold the latter in contacting engagement with the disk 18. This disk 18 is also provided with a T-shaped bolt, the head 40 for which is adapted to operate in a similar shaped annular slot 41 formed in the stationary disk 13, while the shank of this bolt is provided with a nut 42 which when tightened holds the disk 18 fixed with relation to the stationary disk. In connection with the indexing head, I make use of a chart indicated at 43 in Figure 2, which is provided with indicia indicating the number of turns necessary to give the handle 11 plus a fraction of a turn for the purpose of cutting the work with a particular number of teeth or grooves as the occasion may require. In other words, it will be noted upon

inspection of Figure 2, that this chart 43 contains indicia indicating the number of times plus a decimal fraction of a turn which must be given to the handle 11 in order to cut a predetermined number of teeth or grooves in the work, the chart being used in connection with the index finger in the usual manner.

In practice, the invention is used as follows:

It is of course understood that the turning of the shaft 10 operates the work support (not shown) in the ordinary well known manner, and is provided with a worm gear (not shown) for this purpose. This structure and operation is well known in the art, and accomplished in practically the same manner as illustrated in Patent No. 1,295,363.

Now if it is desired to cut three teeth in a particular gear, reference is made to the chart shown in Figure 2, to determine how many times it is necessary to turn the handle 11 for properly spacing the teeth on the gear. It will be noted that the handle 11 must be turned thirteen times plus .33333 of a turn after each tooth is cut. Assuming that the handle 11 is in neutral position as shown in Figure 1, it is only necessary to loosen the nut 33, to release the index finger 28 for movement. Then by turning the micrometer sleeve 24, the index finger 28 is moved to a position upon the disk 18 equivalent to .33333 of a turn. The nut 33 is then tightened to hold the index finger in this position, while the nut 16 is loosened to release the handle 11 from the disk 13. The handle is then turned to rotate the shaft a distance equal to .33333 of a revolution, the stop 35 carried by the handle being brought into engagement with the index finger 28. The tooth is now cut in the gear, and after this has been accomplished the nut 42 is loosened to allow the disk 18 to be rotated until the stop 21 is brought against the stop pin 35 on the handle. Now tighten the nut 42, and the index head is again set to space for the next tooth. The handle 11 is now turned thirteen times in order to rotate the shaft 10, which as above stated is geared to the work support to gradually turn the latter a distance equal to the desired distance between the teeth on the gear. It is necessary to lift the stop rod 35 over the stop 21 and the index finger 28 during each revolution of the handle 11, but after the rod 35 is lifted over the stop 21 on the thirteenth turn of the handle 11 it is let down or lowered against the disk 18, and the handle further turned until it is brought into engagement with the index finger 28. The nut 16 is then tightened to hold the handle fixed in this given position while the next tooth on the gear is being cut, and when this has been accomplished, the operation is repeated to provide the necessary space between the tooth just cut and the next tooth to be cut. The index chart is read the same as a micrometer, and if it is desired to turn the work support any decimal fraction of a turn, it is only necessary to set the stop 21 and index finger 28 accordingly, and turn the handle that particular distance. Every whole number on the chart is indicative of one complete turn of the handle 11. The micrometer index is capable of dividing any circle into any number of equal parts from one to one thousand.

While is it believed that from the foregoing description, the nature and advantages of the invention will be readily apparent, I desire to have it understood that I do not limit myself to what is herein shown and described, and that such changes may be resorted to when desired as fall within the scope of what is claimed.

Having thus described the invention, I claim:

1. In an indexing head of the character described, the combination with a rotatable shaft and a handle therefor, of a stationary disk, means for holding said handle fixed with relation to said disk, a graduated disk mounted for rotation, cooperating means carried by the handle and movable disk for limiting the rotation of the latter, an index finger movable with relation to the graduated disk, means including a micrometer sleeve for adjusting the index finger, and means for holding the index finger and graduated disk fixed relatively for simultaneous adjustment.

2. In an indexing head of the character described, the combination with a rotatable shaft and a handle therefor, of a stationary disk, means for holding said handle fixed with relation to the disk, a spring pressed rod projecting from the handle, a graduated disk mounted for rotation, a stop carried by the graduated disk and adapted to engage said rod to limit the rotation of said disk, an index finger movable across the graduated disk, means including a micrometer sleeve for adjusting said finger, means for holding said finger fixed with relation to the movable disk for subsequent adjustment therewith as a unit, and said finger being disposed in the path of said spring pressed rod and constituting a stop therefor.

3. In an indexing head of the character described, the combination with a rotatable shaft and a handle therefor, of a stationary disk, means for holding said handle fixed with relation to said disk, a spring pressed rod projecting from one side of the handle, a graduated disk mounted for rotation and including a hub, a gear carried by said hub, a stop carried by said disk and adapted to engage said rod to limit the rota-

tion of said disk, an index finger movable across said graduated disk, a plate supporting said finger and mounted on said shaft, a worm gear journalled on said plate and meshing with the gear of said disk, a micrometer sleeve for turning the worm gear, whereby said index finger is adjusted across said disk, means for holding said index finger fixed with relation to the disk for adjustment therewith as a unit, and said index finger constituting a stop for said handle and adapted to be engaged by the rod carried thereby.

In testimony whereof I affix my signature.

ROYDEN K. McDOUGAL.