July 10, 1923.

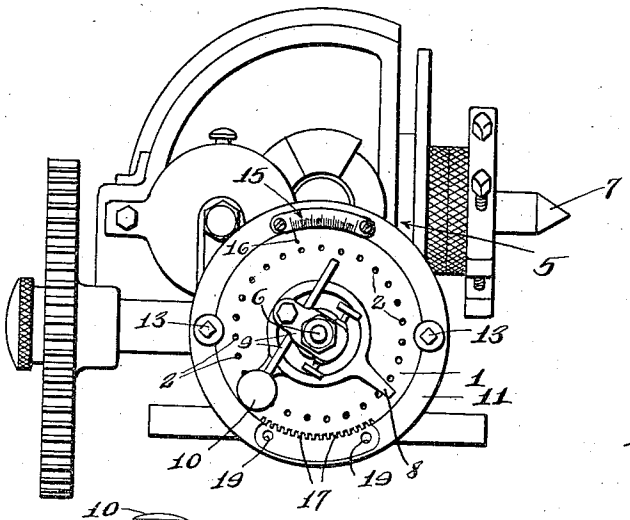
1,461,316

E. R. LA CASSE

INDEXING PLATE FOR MILLING MACHINES

Filed May 9, 1921

Fig. 1.



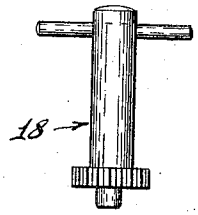


Fig. 3.

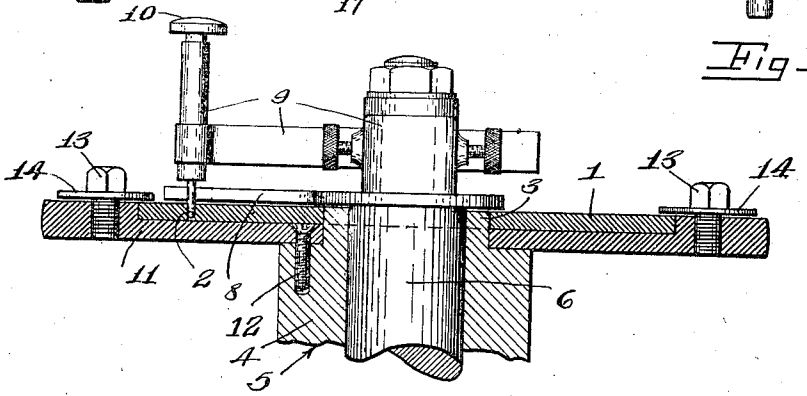


Fig. 2.

Eugene Raymond La Casse INVENTOR.

BY

Parsons & Bordell ATTORNEYS.

Patented July 10, 1923. 1,461,316

UNITED STATES PATENT OFFICE.

EUGENE RAYMOND LA CASSE, OF SYRACUSE, NEW YORK, ASSIGNOR OF ONE-HALF TO CHARLES A. HAAG, JR., OF SYRACUSE, NEW YORK.

INDEXING PLATE FOR MILLING MACHINES.

Application filed May 9, 1921. Serial No. 468,049.

To all whom it may concern:

Be it known that I, EUGENE RAYMOND LA CASSE, a citizen of the United States, and a resident of Syracuse, in the county of Onondaga and State of New York, have invented a certain new and useful Indexing Plate for Milling Machines, of which the following is a specification.

This invention relates to indexing devices for the spindles of milling machines and the like, and has for its object the production of a differential index plate or device by which a maximum number of adjustments or indexing of the work can be made with the single series of holes with any given ratio of reduction between the index shaft and the spindle, which indexing device is particularly simple in construction and operation and highly efficient in use, and the invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is an elevation of a conventional Brown & Sharpe index head provided with this indexing device.

Figure 2 is a sectional view of the device.

Figure 3 is a detail view of the key wrench for turning the index plate.

This indexing device comprises a plate formed with a circular series or holes, a pointer movable over the face of the plate, the plate being normally held from movement about its axis and being shiftable about its axis to change the positions of the holes relatively to the pointer, and means for determining the amount of shifting movement of the plate for the predetermined indexing movement.

1 designates the plate which is formed with a circular series of holes 2 here shown as twenty-seven in number, the plate being mounted on the reduced end 3 of a hub 4 or bearing on the indexing block 5 in which is journaled a shaft 6 connected to the indexing spindle 7 through suitable reduction gearing including spiral gears on the shaft and spindle. Interchangeable trains of gears may be substituted to change the gear ratio as will be understood by those skilled in the art. Any number of holes 2 may be used but twenty-seven are used in order to adapt the device to the standard Brown & Sharpe index head. The reduction gearing forms no part of this invention and as the construction and operation thereof is well known, further description is thought to be unnecessary.

8 designates the pointer which is mounted on the shaft to turn with said shaft, the pointer having suitable means associated therewith for entering any one of the holes 2. This means is of the usual construction and includes a crank 9 mounted on the end of the shaft 6 in the usual manner and having the usual handle 10 which is movable outwardly relatively to the crank and has a pin at its inner end of entering the holes 2.

In the illustrated embodiment of my invention, the means for normally holding the plate 1 from movement about its axis comprises a plate 11 mounted on the reduced end 3 of the hub or bearing 4 and secured to the hub by screws 12 extending through the plate 11 and threading into the larger part of the hub 4 at the base of the reduced portion, the plate 11 having a circular recess on its front side in which the plate 1 is positioned, and clamping means as screws 13, threading into the margin of the plate 11 and pressing against washers 14 overlying the margin of the plate 1.

The means for determining the amount of shifting movement of the plate 1 in order to change the position of the holes 2 relatively to the pioneer or to the pin of the handle 10 comprises coacting scales on the plate 11 adjacent the margin of the plate 1 and on the margin of such plate 1.

15 designates a scale graduated in degrees and minutes on the margin of the plate 11 and 16 is a single graduation or mark on the plate 1.

To facilitate the turning of the plate 1, it is formed with teeth 17 in a portion of its

periphery for coacting with a wrench key 18, Fig. 3, for entering holes 19 in the plate 11.

In operation, for a predetermined indexing of the spindle 6 the handle 10 is moved outwardly to disengage the pin from one of the holes 2 and the crank 9 turned to turn the shaft 6 and the pointer 8 a predetermined number of holes as for instance nine holes, and then any predetermined fractional distance between the holes is determined by loosening the screws 13 and rotating the plate 1 about its axis say for instance 7°, and then again rotating the pointer by means of the handle to bring the pin in line with the next hole so that the indexing will be nine holes plus 7°. Instead of shifting the plate 1 in an advance direction, it may be moved backwardly 3° as determined by the scales 15, 16. For each indexing this operation is repeated.

Therefore by this indexing device an indefinite number of indexing can be effected with a single series of holes.

If desired, the scale 15 may extend through a circle of 360° and the plate 1 may be notched throughout its entire periphery but this is unnecessary as the indexing can be accomplished by adding on the additional number of degrees to the number of holes over which the handle 10 is moved and when the line 16 of the plate 1 reaches the end of the scale the plate 1 can then be rotated in the reverse direction and the amount of spacing determined by subtracting the amount previously added from the next number on the scale 14, that is, the scale is graduated in divisions of 10 and in the first operation, the additional number is added on and in the second operation the number is substracted from 10.

In a Brown & Sharpe index head the index spacing number is forty that is, forty revolutions of the index crank are required to make one complete revolution of the index spindle. In my index plate there are twenty-seven holes to conform to the Brown & Sharpe index system. For other systems a different number of holes would be necessary.

Movement of the pointer 8 one hole equals 1/27 of 360° or 13° 120′. Hence, to space an equal number of degrees and have the pin of the crank handle aline with one of the holes 2 of the index plate, it is necessary to move the crank three holes or multiple of three, $3 \times 13° 120' = 40°$. As the ratio of gearing is 40 to 1 it is therefore necessary to move the crank 9 three holes of the index plate to space one degree on the spindle. Then, to obtain for example, a spacing or indexing of 3° 7′ on the work rotatable with the spindle, move the crank 9, nine holes on the plate 1, then loosen the screws 13 and insert the wrench head 18 to mesh with the teeth 17 of the plate 1; withdraw the pin of crank handle from the hole 2, turn the wrench head until the zero mark on the plate 1 is in line with the seventh line or graduation on plate 11; tighten the screws 13 and advance the index crank until it is in line with the ninth hole and insert the pin in the ninth hole. This will give a spacing of 3° 7′ on the spindle or work.

What I claim is:

1. An indexing device for indexing heads of milling machines and the like which heads comprise a shaft connected to the indexing spindle through suitable reducing gearing, the device including inner and outer concentric index plates mounted concentric with the shaft, the inner plate having a circular series of equally spaced holes and a pointer mounted on the shaft to turn therewith and movable over the inner plate, and having means associated therewith for entering any one of the holes, the outer plate being fixed from movement and the inner plate being normally fixed from movement about its axis and being shiftable about its axis to change the position of the holes relatively to the pointer, means for determining the amount of such shifting movement to position one of the holes for a predetermined indexing and means for normally locking the inner plate from shifting movement, substantially as and for the purpose specified.

2. An indexing device for indexing heads of milling machines and the like which heads comprise a shaft connected to the indexing spindle through suitable reducing gearing, the device including inner and outer concentric index plates mounted concentric with the shaft, the inner plate having a circular series of equally spaced holes, and a pointer mounted on the shaft to turn therewith and movable over the inner plate and having means associated therewith for entering any one of the holes, the outer plate being fixed from movement about its axis and being shiftable about its axis to change the position of the holes relatively to the pointer, coacting scales provided on the inner and outer plates for determining the amount of such shifting movement to position one of the holes for predetermined indexing, and means for normally locking the inner plate from shifting movement, substantially as and for the purpose set forth.

3. An indexing device for the indexing heads of milling machines and the like which heads comprise a shaft connected to the indexing spindle through suitable reducing gearing, the device including inner and outer concentric index plates mounted concentric with the shaft, the inner plate having a circular series of equally spaced holes, and a pointer mounted on the shaft and movable over the inner plate and having means associated therewith for entering any one of the holes, the outer plate being fixed from

movement and the inner plate being normally fixed from movement about its axis and being shiftable about its axis to change the position of the holes relatively to the pointer, coacting scales provided on the inner and outer plates for determining the amount of such shifting movement to position one of the holes for predetermined indexing, and means for locking the inner plate to the outer plate, substantially as and for the purpose described.

In testimony whereof, I have hereunto signed my name, at Syracuse, in the county of Onondaga, and State of New York, this 24th day of April, 1921.

EUGENE RAYMOND LA CASSE.

Certificate of Correction.

It is hereby certified that in Letters Patent No. 1,461,316, granted July 10, 1923, upon the application of Eugene Raymond La Casse, of Syracuse, New York, for an improvement in "Indexing Plates for Milling Machines," errors appear in the printed specification requiring correction as follows: Page 1, line 34, for the word "or" read *of;* line 71, for the word "of" read *for*, and line 89, for the word "pioneer" read *pointer;* and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 14th day of August, A. D., 1923.

[SEAL.]

KARL FENNING,
Acting Commissioner of Patents.