(No Model.)

G. G. NODLE.

INDEX FOR GEAR CUTTING MACHINES.

No. 316,811. Patented Apr. 28, 1885.

NO. OF COGS.	INDEX CIRCLE	NO. OF HOLES.	NO. OF COGS.	INDEX CIRCLE	NO. OF HOLES.
3	480	160	25	300	12
4	480	120	26	312	12
5	480	96	27	378	14
6	480	80	28	420	15
7	378	54	29	348	12
8	480	60	30	480	16
9	414	46	31	372	12
10	480	48	32	480	15
11	396	36	33	396	12
12	480	40	34	408	12
13	468	36	35	420	12
14	378	27	36	468	13
15	480	32	37	222	6
16	480	30	38	456	12
17	306	18	39	390	10
18	414	23	40	480	12
19	456	24	41	246	6
20	480	24	42	420	10
21	420	20	43	430	10
22	198	9	44	396	9
23	276	12	45	360	8
24	480	20	46	414	9

Fig. 3.

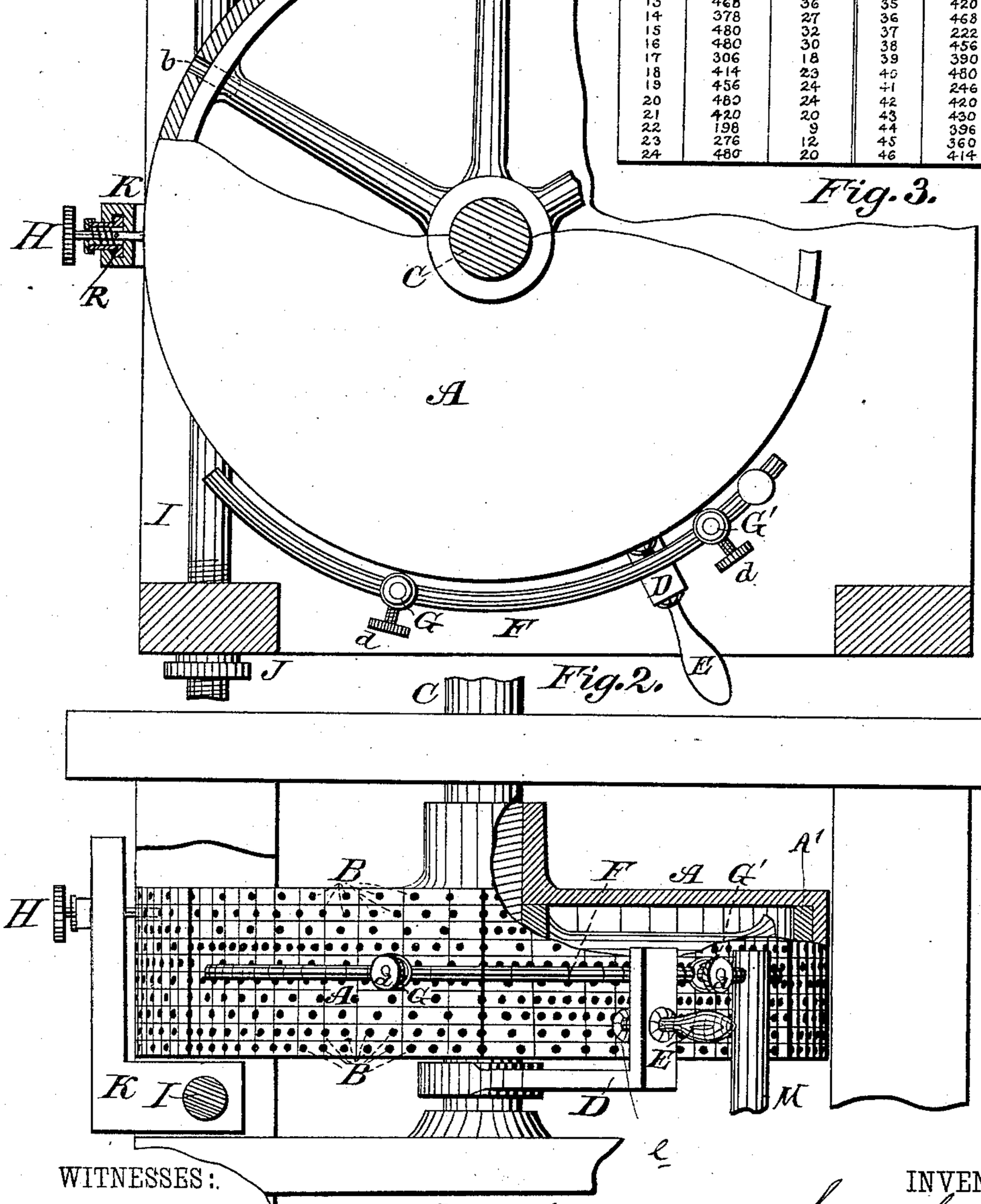

Fig. 2.

Fig. 1.

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INDEX FOR GEAR-CUTTING MACHINES.

SPECIFICATION forming part of Letters Patent No. 316,811, dated April 28, 1885.

Application filed November 6, 1884. (No model.)

To all whom it may concern:

Be it known that I, GEORGE G. NODLE, a citizen of the United States, residing at New Berlin, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Index for Gear-Cutting Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon, in which—

Figure 1 is a side elevation. Fig. 2 is a top view. Fig. 3 is a section of calculating-table.

The present invention has relation to the general improvement and construction of indexes for gear-cutting machines; and its nature consists in the different parts and combination of parts hereinafter described, and pointed out in the claims.

Similar letters of reference indicate corresponding parts in all the figures of the drawings.

In the accompanying drawings, the letter A designates the index-wheel, which is composed of a face-plate and a peripheral flange, in which flange are made any desired number of index-holes, B, and the sectional holes *b*, the index-holes being cut or drilled about one half the way through the periphery of the wheel A, while the sectional holes are cut or drilled entirely through the periphery of said wheel. The index-wheel A is divided into any desired number of segmental sections, each section containing an equal number of holes. Furthermore, the periphery of said wheel A is also divided into the desired number of annular sections, on one of which the number of segmental sections is indicated by suitable numbers. The index-wheel is fitted on an inner wheel, A′, which is securely fixed to a vertical or horizontal shaft, C, on which the gear to be cut is held in the ordinary manner. The main wheel A′ may be termed the "sectional wheel," and is divided into as many segmental sections as there are sections on the outer wheel, A, suitable holes being made at proper intervals to register with the holes *b* in the outer wheel, A, and when said holes register a pin, *a*, serves to lock both wheels togther. A lever, D, having a forked inner end and embracing the shaft C has an outer arm, in which is fitted a handle, E, substantially as is shown in Fig. 2. This handle is generally in the form of a screw or spring stem, which carries a button or shoe, *e*, at its inner end, capable of being held in firm frictional contact with the periphery of the wheel A by the action of said screw or spring handle. The outer arm of the lever D operates or moves between two adjustable stops, G G, fitted in a curved rail or rod, F, which is held in a stationary position by a suitable support, M. The stops are in the form of blocks or collars, and are provided with set-screws *d* for the purpose of locking the same.

The letter I designates a rod, which is attached to the frame of the machine at both ends, and is provided with fastening thumb-nuts J, which also subserve the purpose hereinafter described. On the rod I is fitted an angular arm, K, which has a slot or way made in one of its arms, said slot receiving a sliding block, R, in which is mounted a spring-pin, H. This pin moves with the block, and its function is to engage with any one of the annular series of holes in the periphery of the wheel A and hold the latter in a fixed position.

In use, after finding the desired number of teeth to be cut on the gear, then find by the calculating-table the number of holes it takes in the entire circle to cut the desired number of teeth, and divide that number by the number of segmental sections desired to divide the wheel into, which must be some number of segmental sections that will divide the entire number of index-holes without a remainder or fraction. After finding the number of index-holes to be used in a segmental section that number are cut or drilled in said segmental section, and the number indicated on said segmental section, different sections and different numbers of index-holes B being placed on said wheel, as indicated by the calculating-table, as shown in Fig. 3 of the drawings.

The operations of my invention are as follows: The gear desired to be cut is securely held to the shaft C in the ordinary manner. The inner or sectional wheel, A′, being fixed on the shaft C, and the outer wheel, A, being loosely mounted on the wheel A′, it is obvious

that said outer wheel can turn loosely on the inner wheel when not secured, as hereinafter described. For the purpose of illustration, I will say eighty (80) teeth are to be cut on the gear. The whole number of index-holes in the entire circle are four hundred and eighty, (480,) which is divided by eighty, (80,) which divides the entire circle into six (6) equal segmental sections, thus leaving eighty holes in one segmental section, and the sector set so as to take in six (6) holes in the segmental section for one tooth, and so on until the entire segmental section is used. After this the index-wheel A is turned back one section and worked over, and so on until the whole gear is cut. The above calculation will apply to any desired number of teeth so long as the index-wheel A can be divided into six (6) equal segmental sections. When not, then some number of segmental sections must be used that will divide without a remainder. The index-wheel A is held to the index-wheel proper by means of the index-pin *a* and the index-lever D, said index-wheel A being firmly held against the face of the index-wheel proper by the screw or spring handle E, the inner end of said lever D being loosely attached to the shaft C, as heretofore described.

The stops G on the curved rail F being set with reference to the number of holes it takes to cut a tooth on the gear, it is obvious that when the first tooth is cut the spring-catch H is withdrawn, and the lever D brought up to the stop G and the spring-catch again placed in proper position, when the lever D is released from the index-wheel A and moved back to the stop G′, and so on until an entire segmental section of the index-wheel A is gone over, when the pin *a* is removed and the index-wheel A turned back one segmental section and again secured, as before, and so on until the gear is finished.

Should the center of the gear be lost while being cut, or its position be otherwise disturbed, a slight but sufficient adjustment of the index-wheel can be effected by means of the nuts J on the rod I, and as the wheel A is connected with the rod I by means of the arm K and spring-pin H, it is apparent that the gear can be returned to its proper position by the devices specified.

The object of having the thumb-nuts J is to adjust the gear in case its center is lost.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an index for gear-cutting machines, the combination of the loose outer wheel, consisting of a face-plate and a peripheral flange having index-holes, with the inner wheel, A′, adapted to be locked to and released from said outer wheel, and the work-shaft C, on which the inner wheel is fixed, substantially as described.

2. In an index for gear-cutting machines, the combination of the loose wheel A, having an annular series of depressions or holes, B, and holes *b* at proper intervals thereon, and the inner or sectional wheel having holes adapted to register with the holes *b* in the outer wheel, and a detachable pin, *a*, for locking the two wheels together with the work-shaft or mandrel C, fixed to the inner wheel, substantially as described.

3. In an index for gear-cutting machines, the combination of the rod I, nuts J, arm K, block R, and locking-pin H, with the outer and inner index-wheels, A A′, and work-shaft C, substantially as described.

4. In an index for gear-cutting machines, the combination of the curved rail F, adjustable stop G, and lever D, having a clamping or fastening device, E, with the inner and outer index-wheels, A A′, and work-shaft C, substantially as described.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

GEORGE G. NODLE.

Witnesses:
U. S. GRAY,
MILEN A. NODLE.