

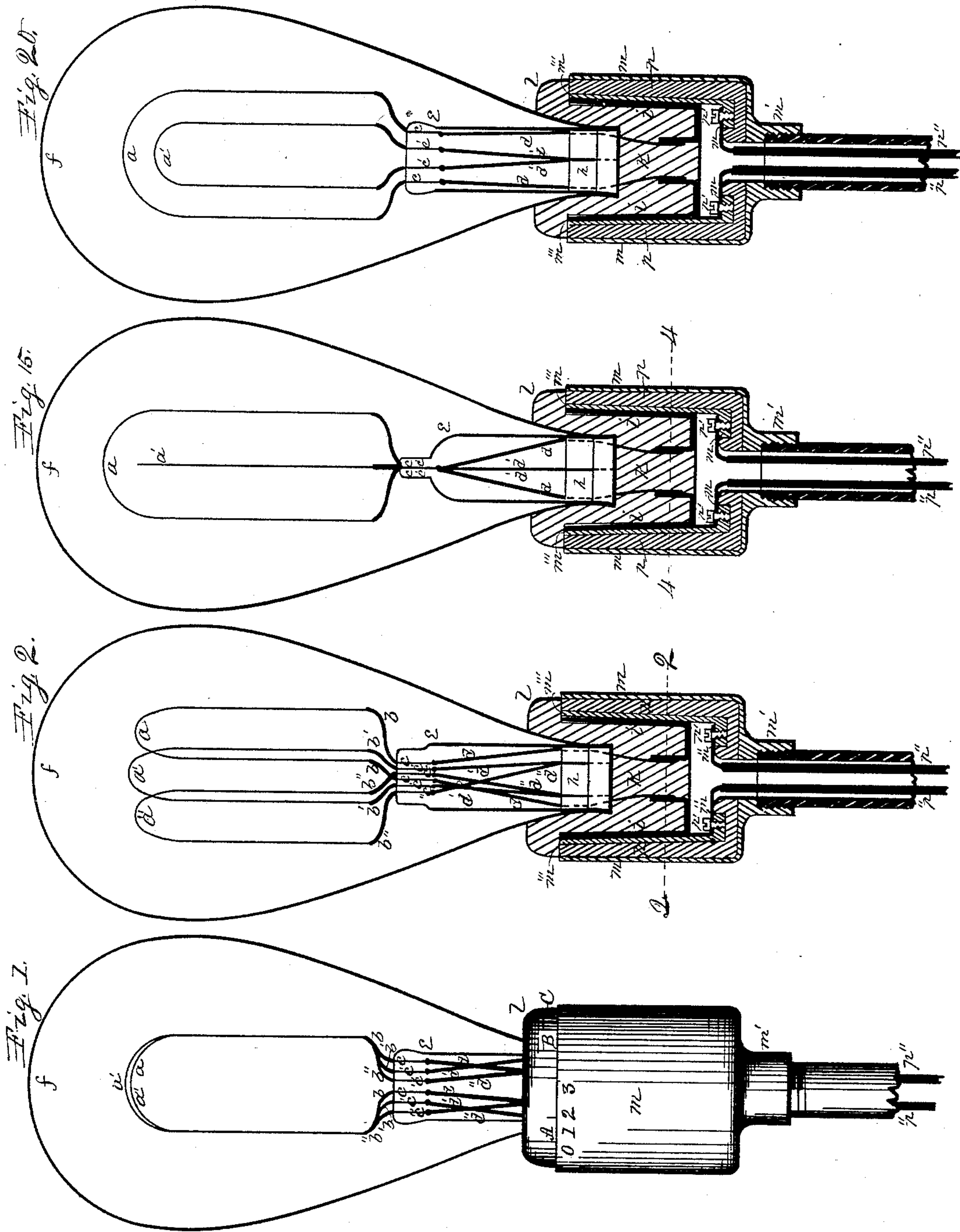
(No Model.)

4 Sheets—Sheet 1.

J. NELSON.
INCANDESCENT ELECTRIC LAMP.

No. 327,578.

Patented Oct. 6, 1885.



Witnesses.

J. A. Behel.
D. A. Behel.

Inventor.
John Nelson.
Per Jacob Behel Atty.

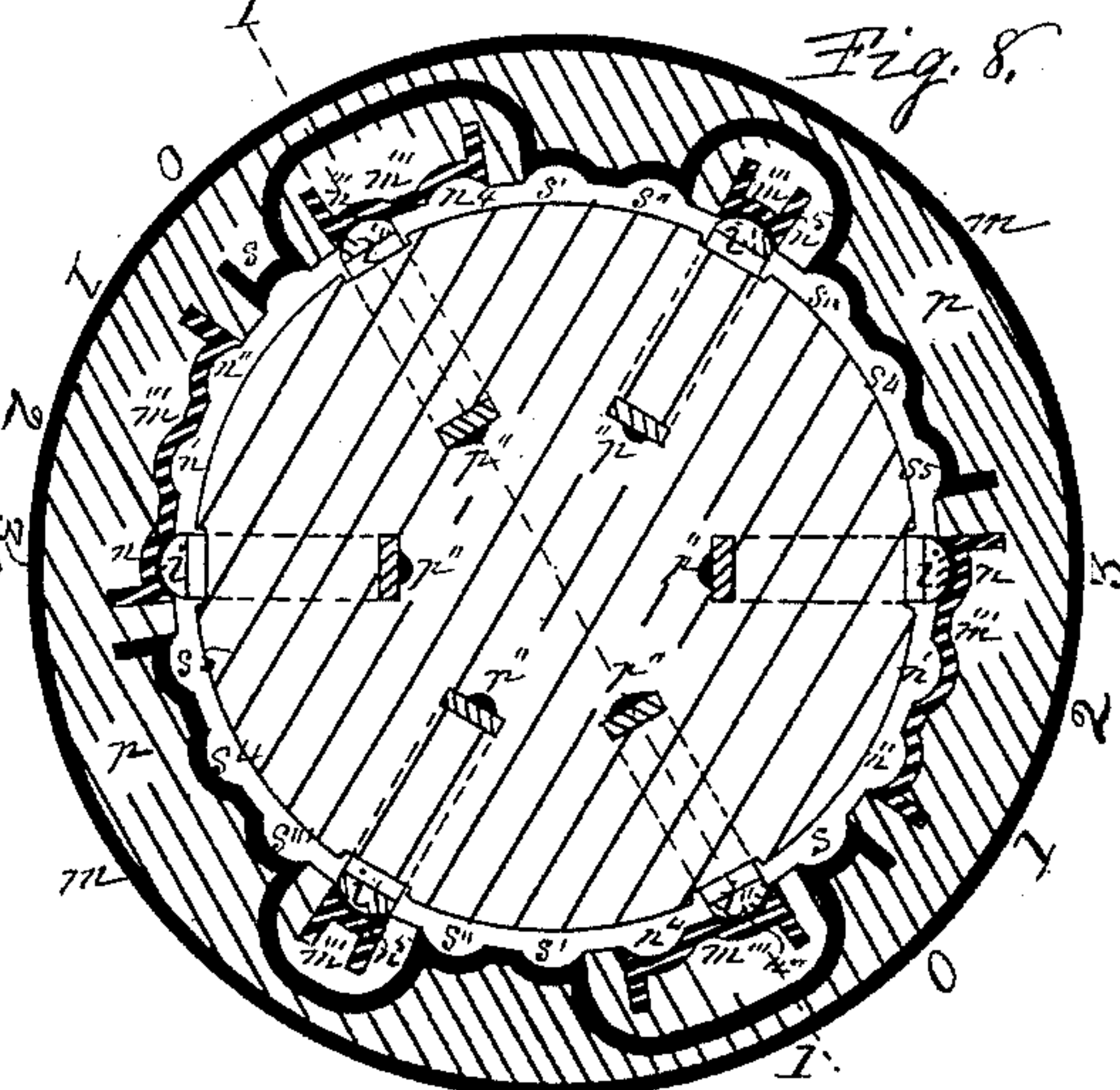
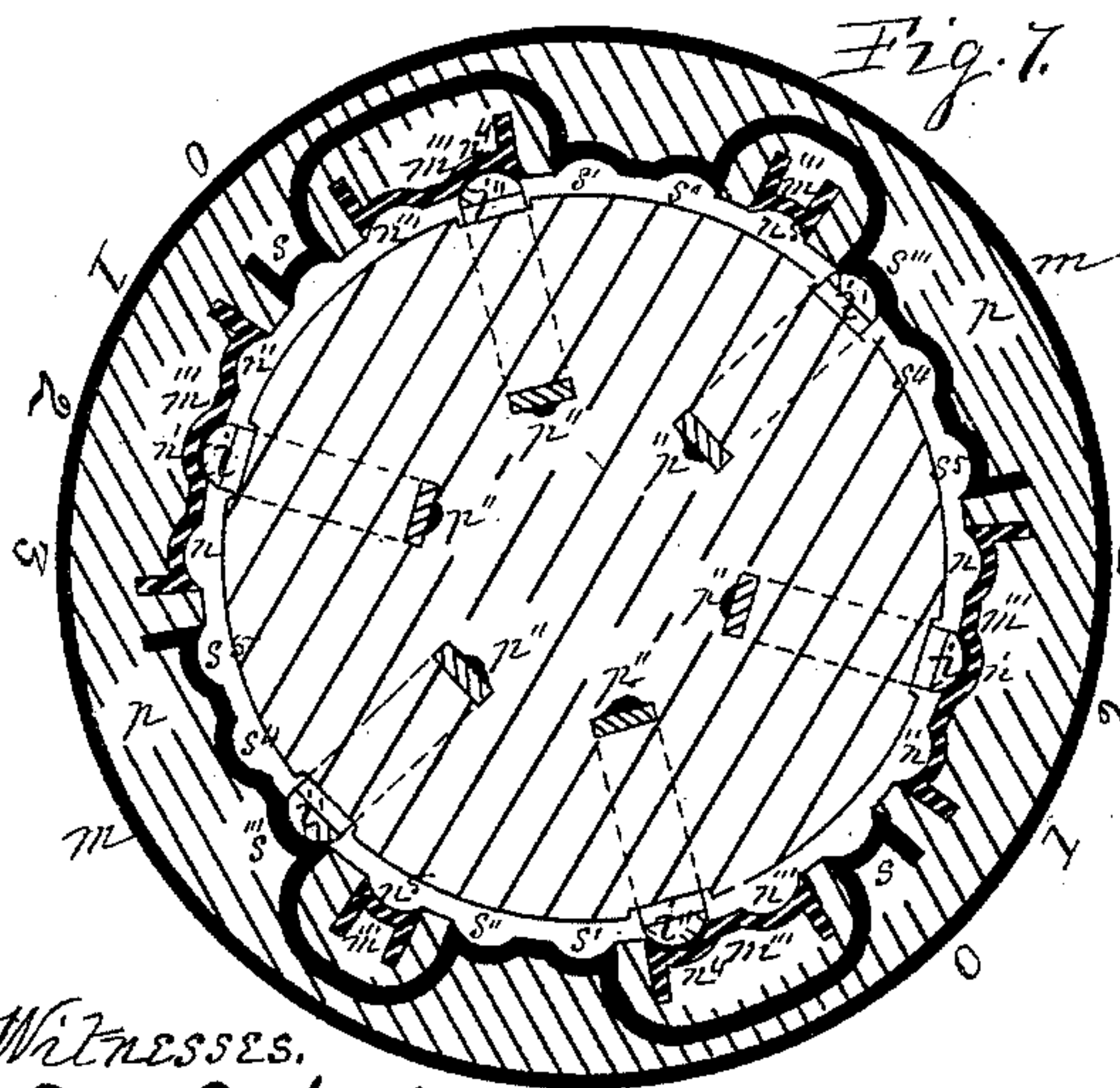
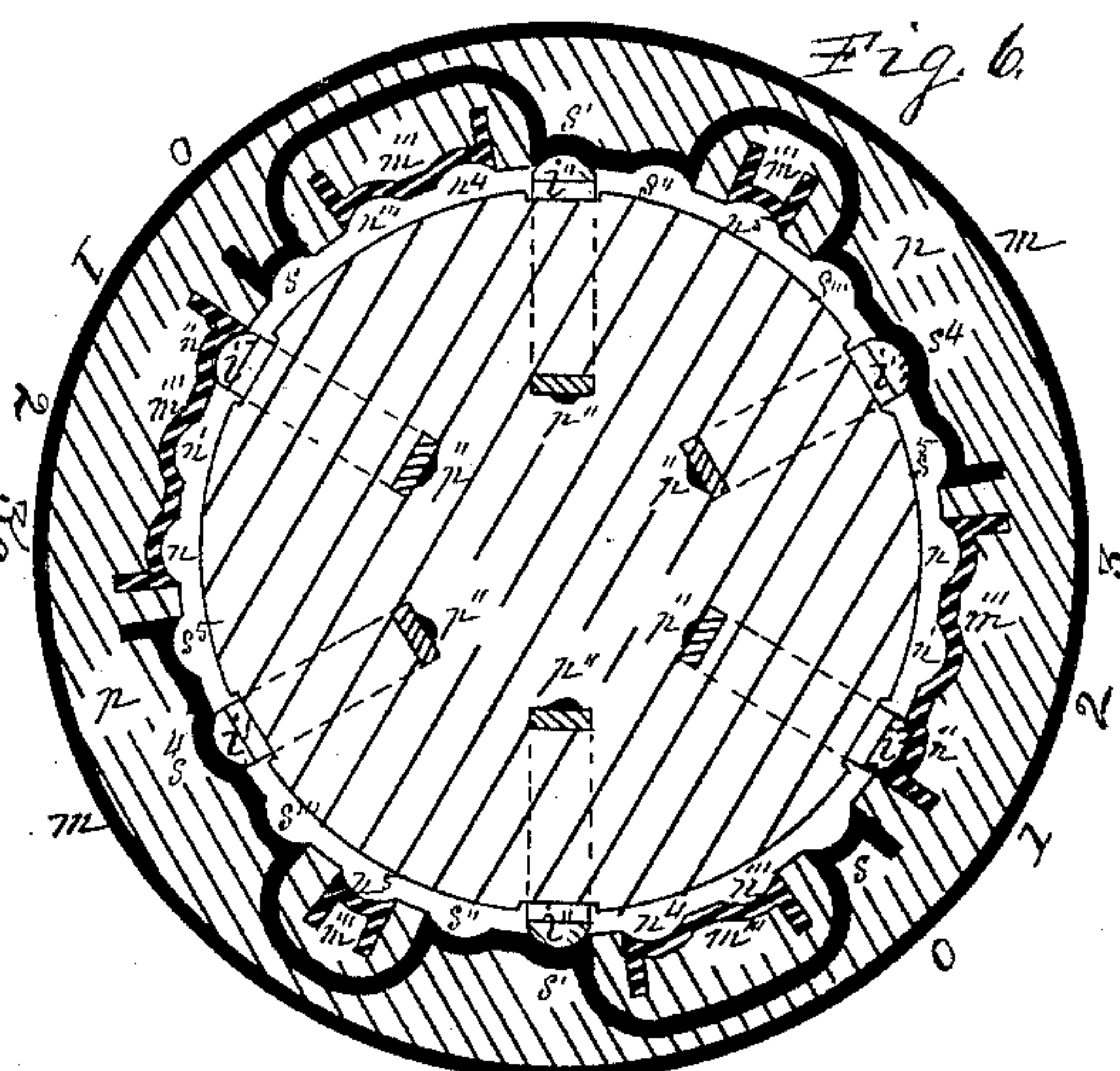
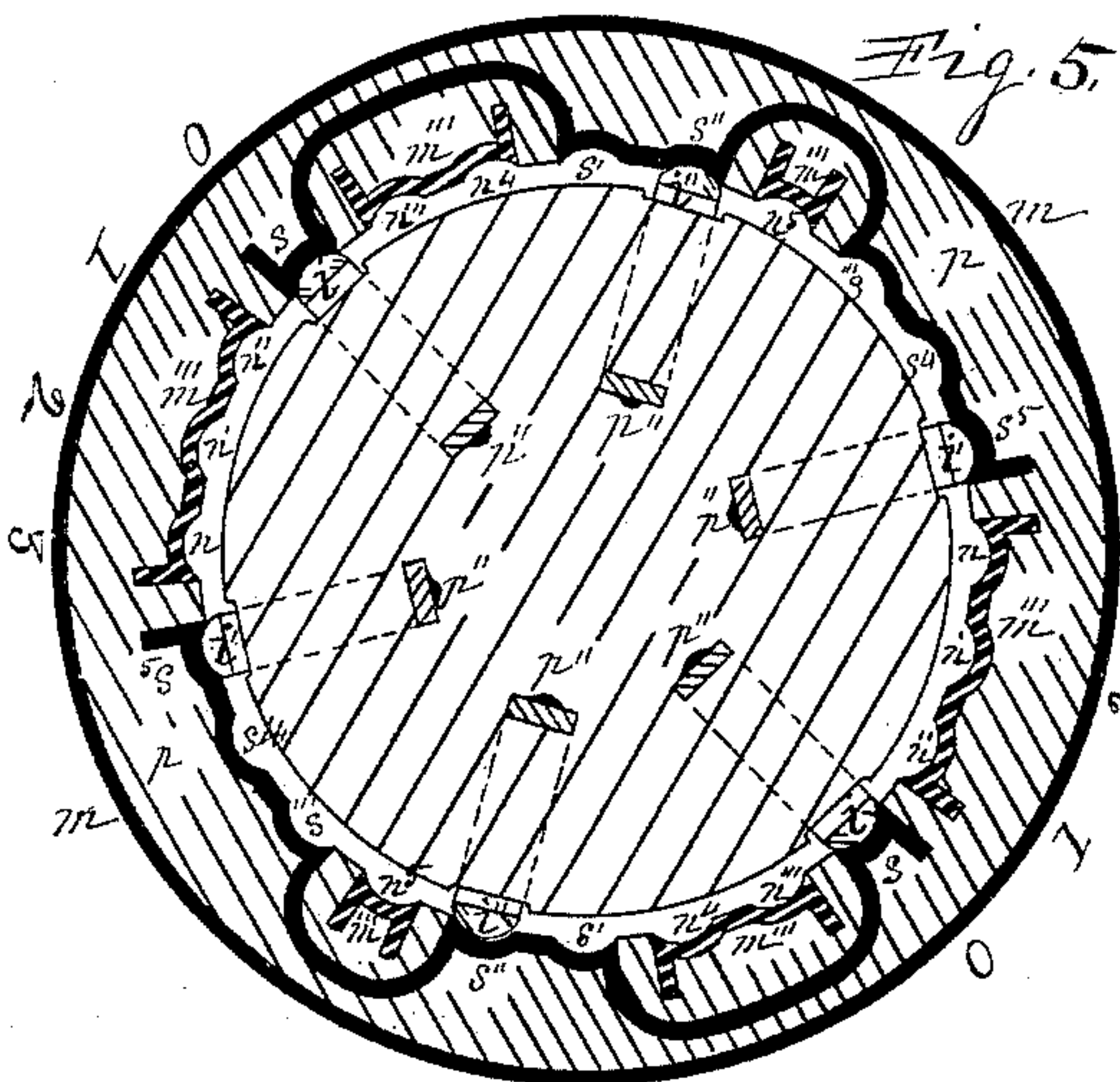
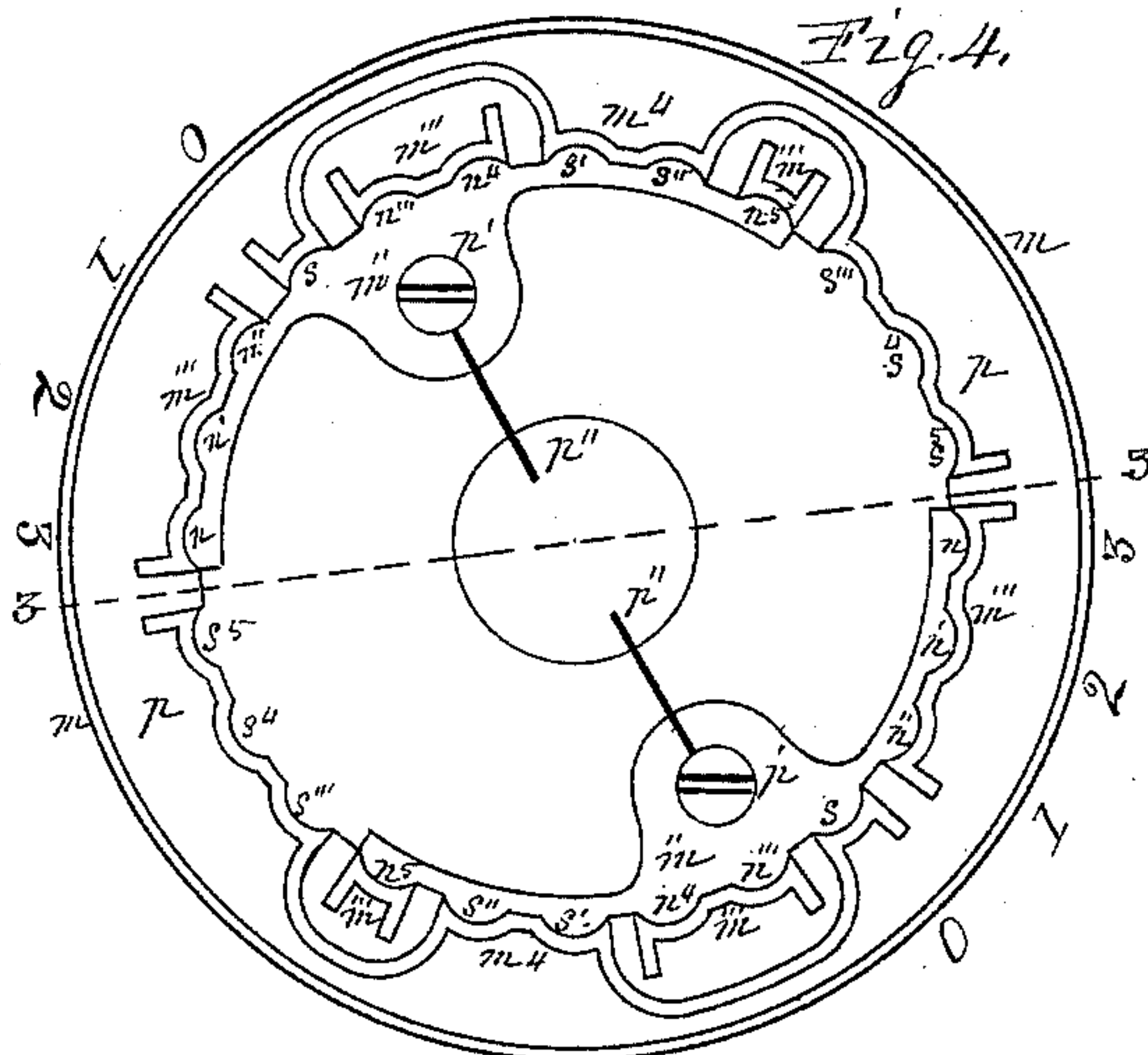
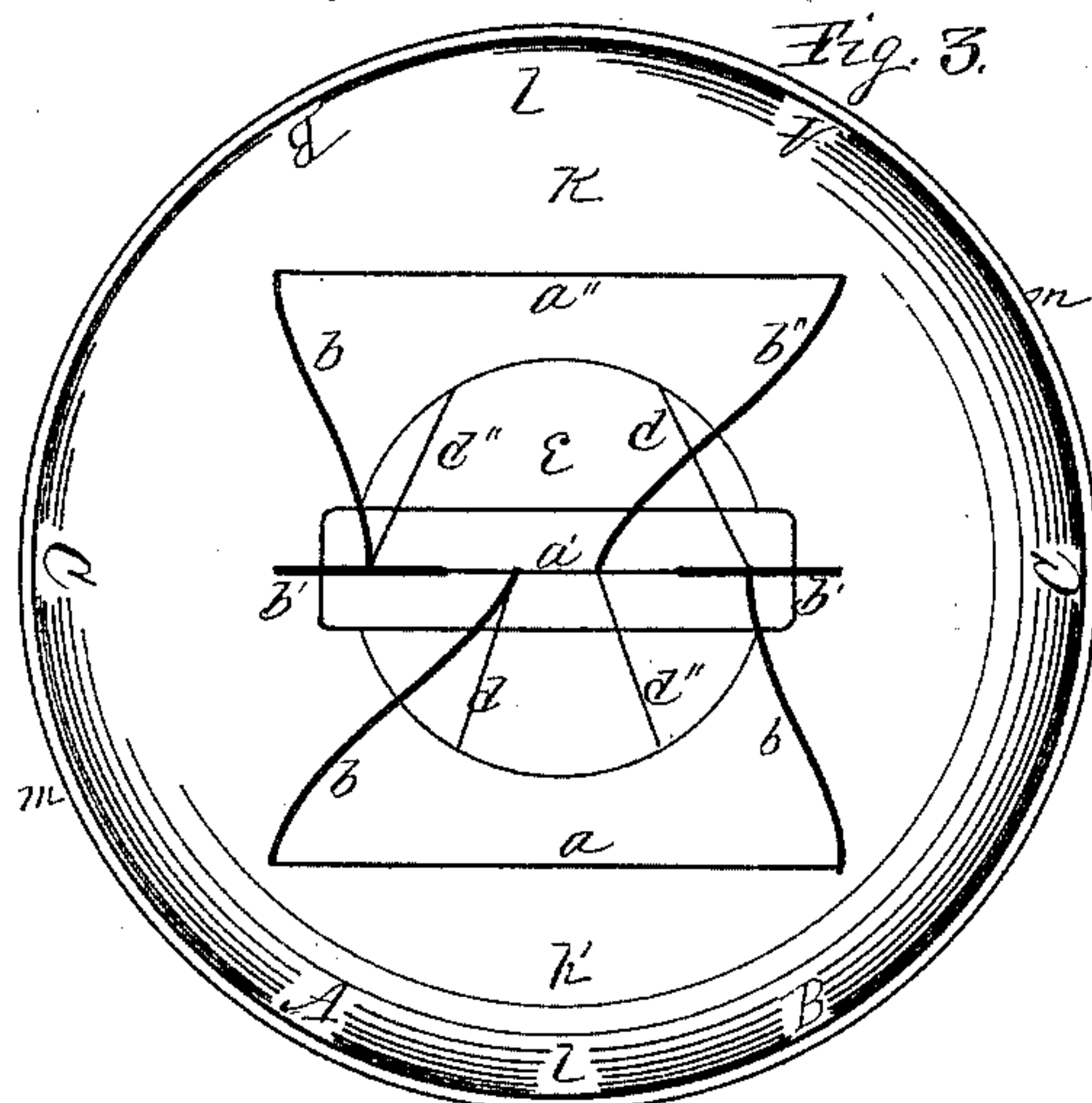
(No Model.)

4 Sheets—Sheet 2.

J. NELSON.
INCANDESCENT ELECTRIC LAMP.

No. 327,578.

Patented Oct. 6, 1885.



WITNESSES.
A. O. Behel
J. A. B. Behel.

Inventor.
John Nelson.
Per Jacob Bachel. Atty.

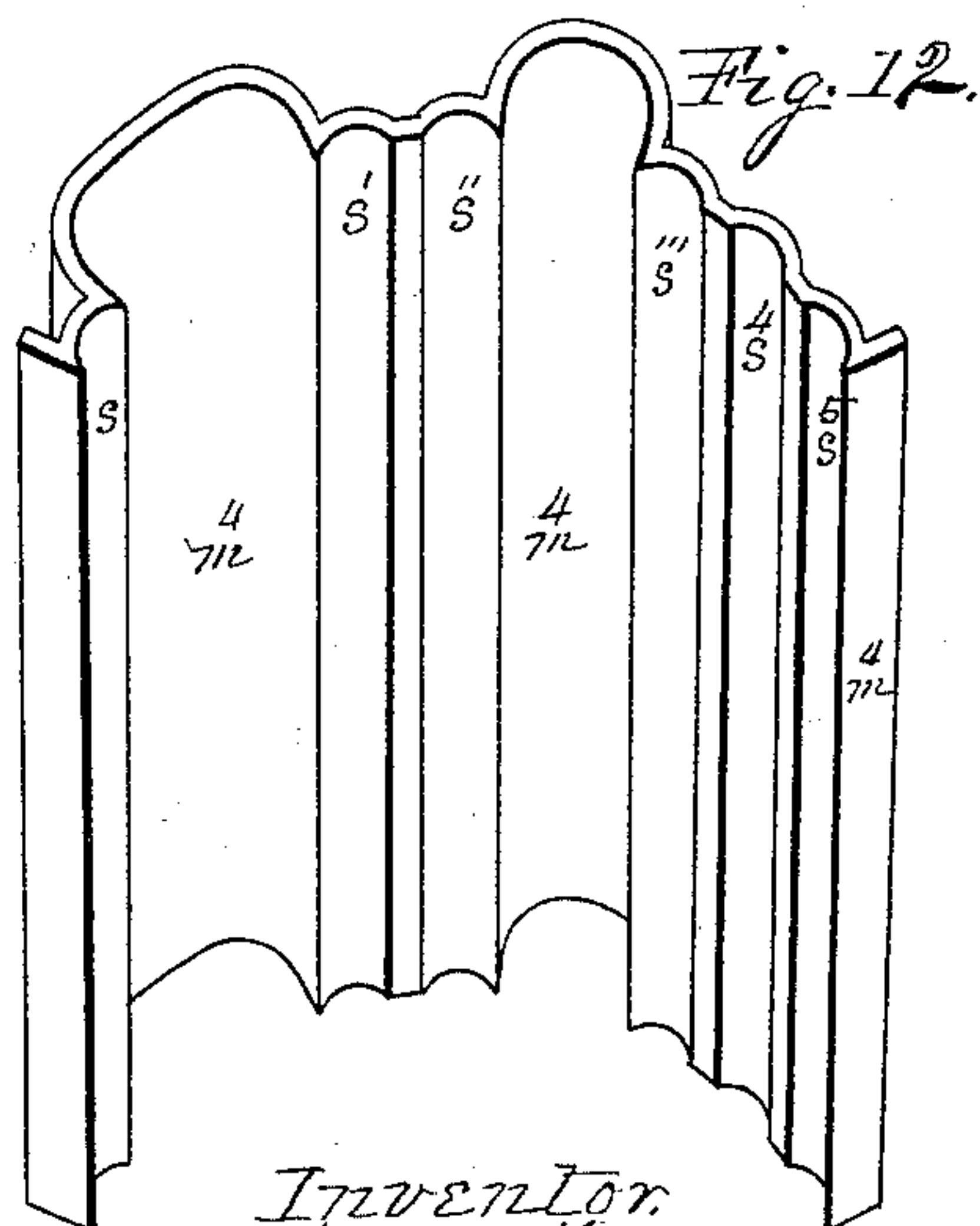
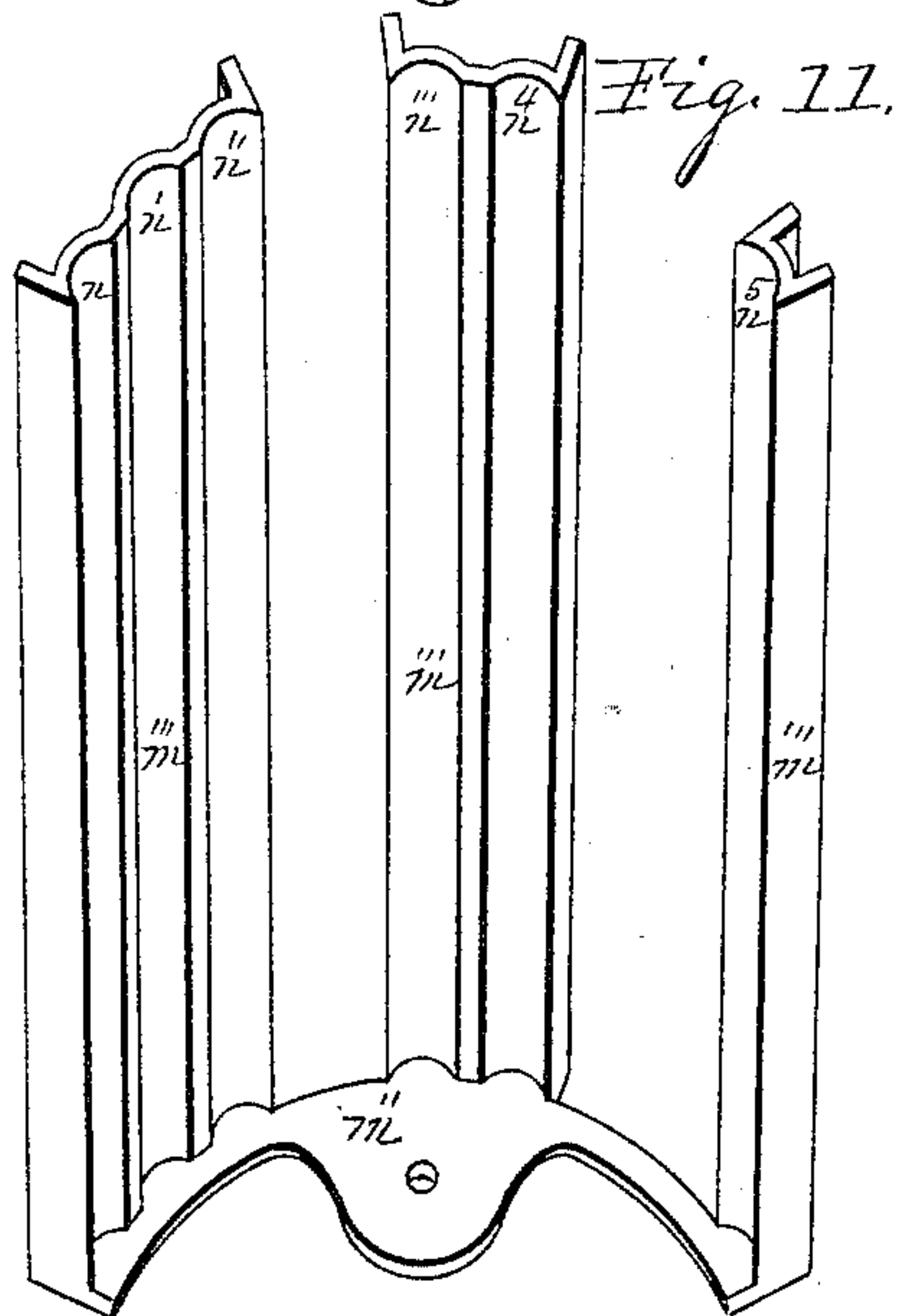
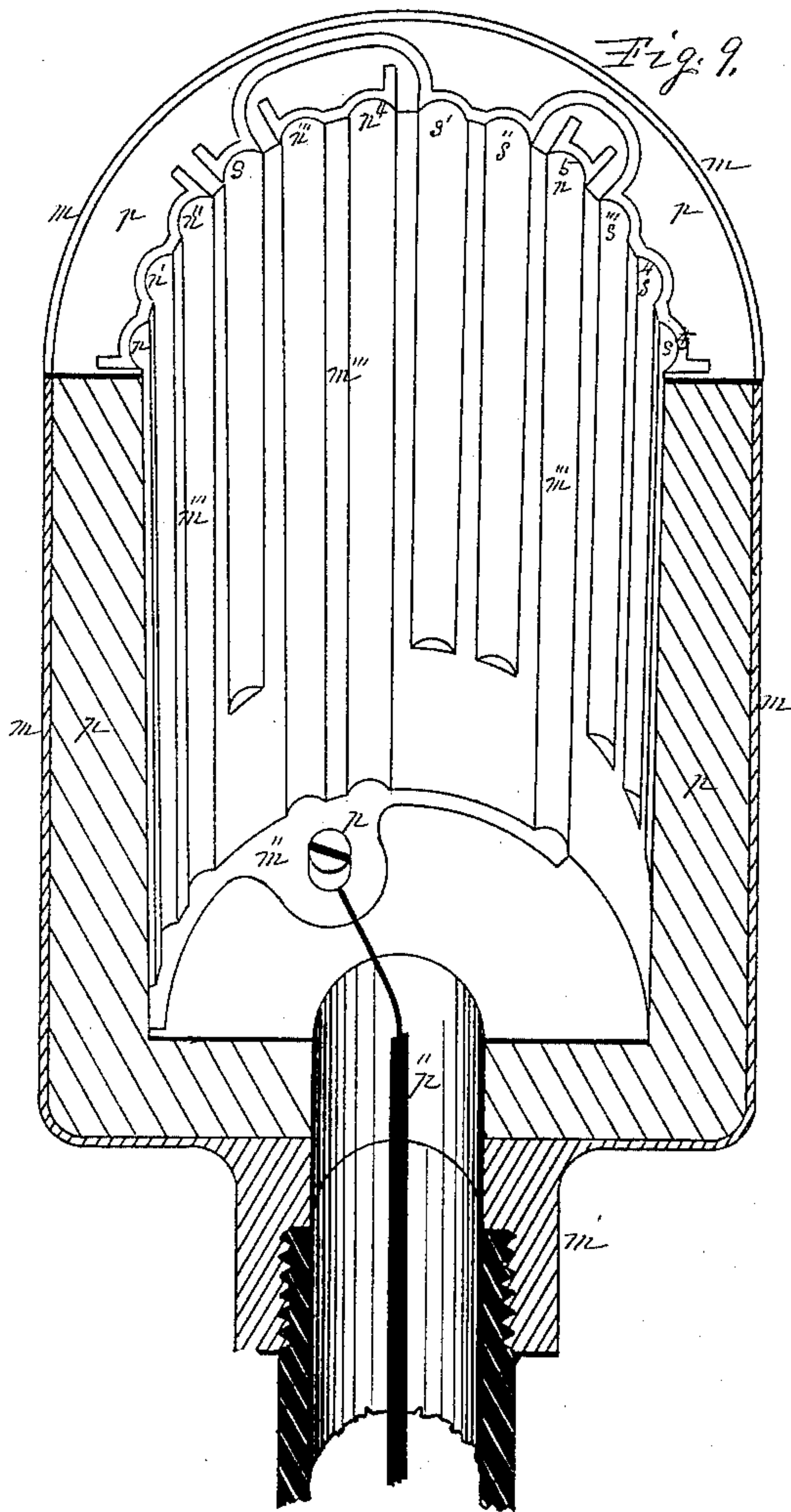
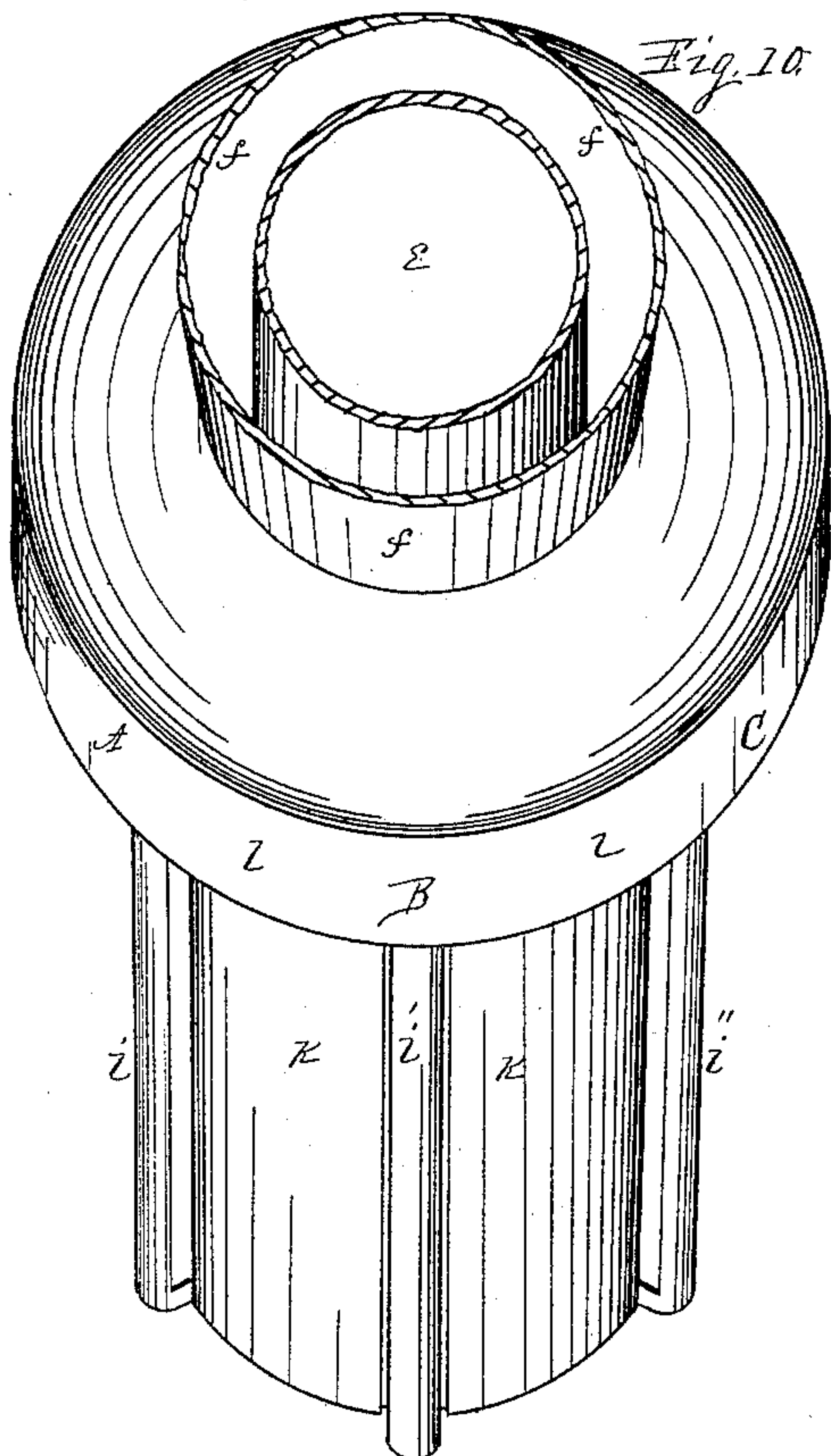
(No Model.)

4 Sheets—Sheet 3.

J. NELSON.
INCANDESCENT ELECTRIC LAMP.

No. 327,578.

Patented Oct. 6, 1885.



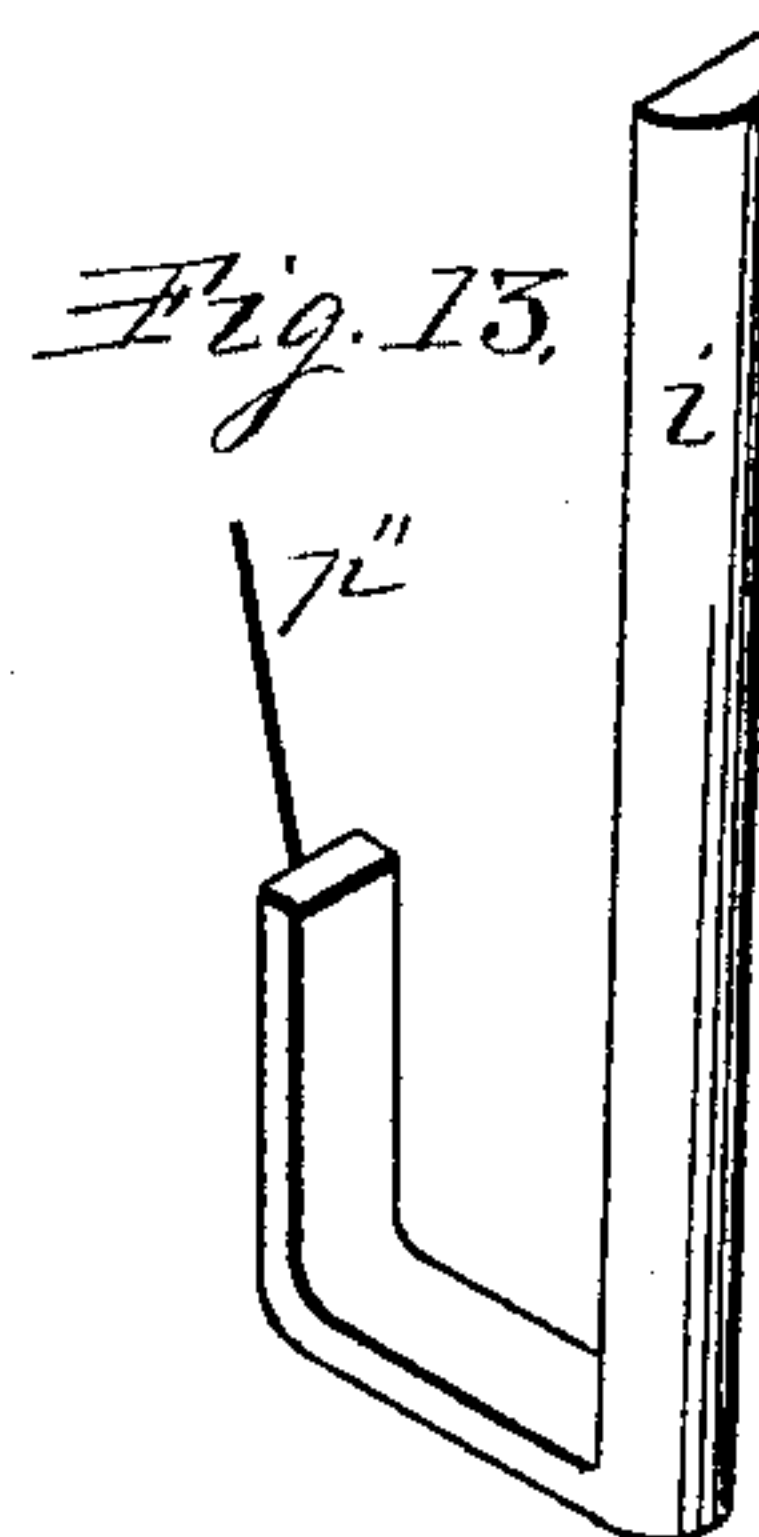
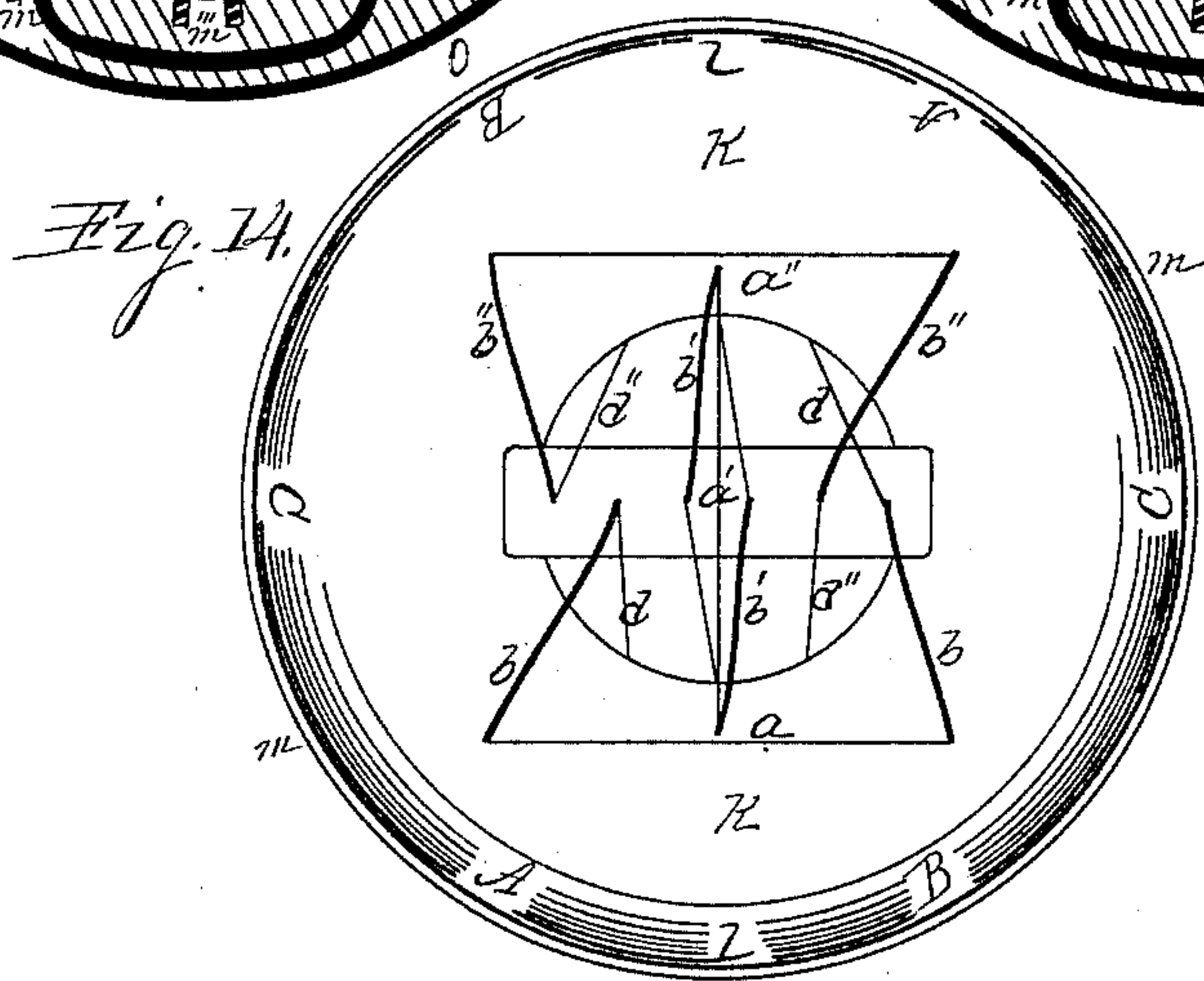
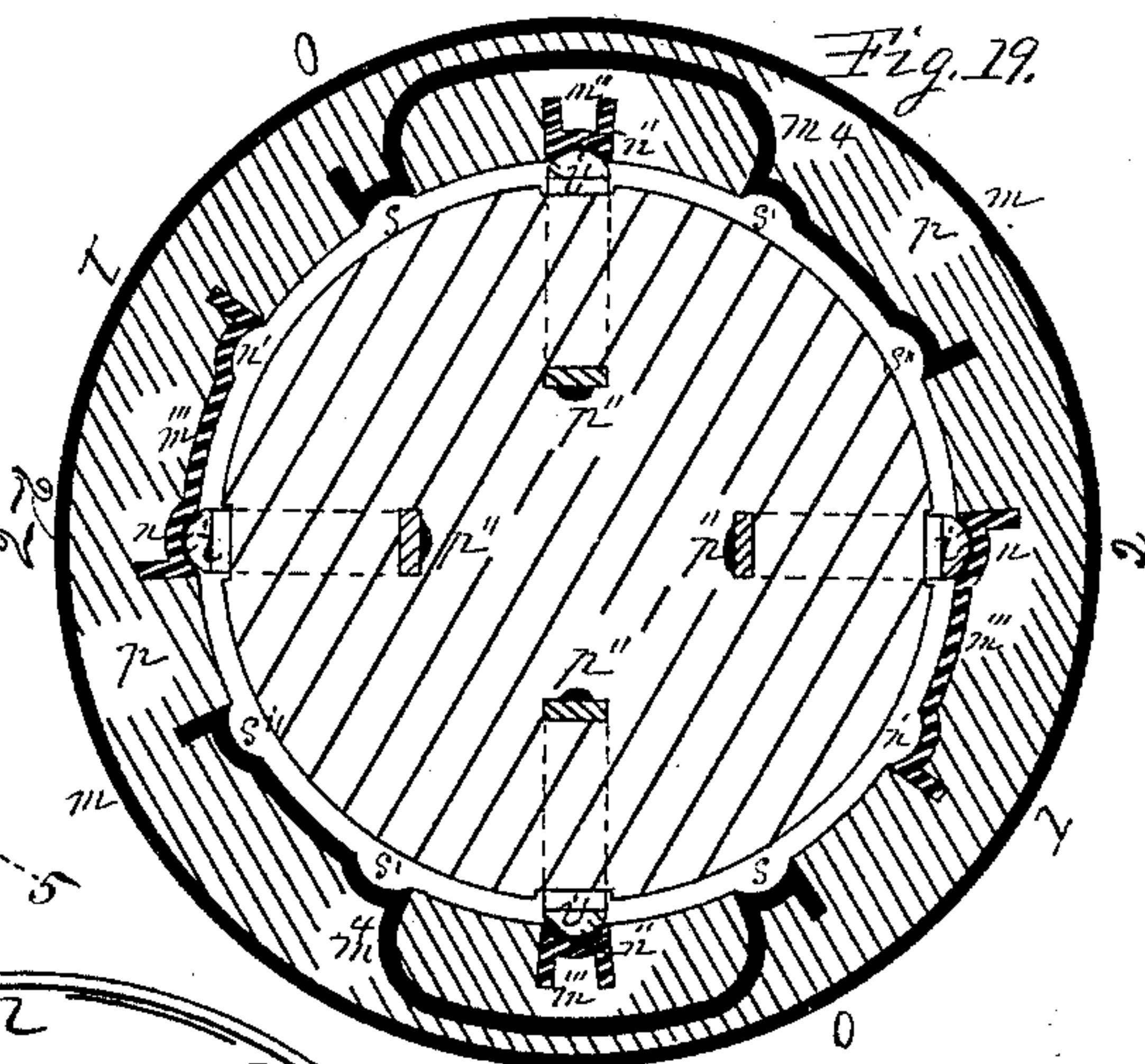
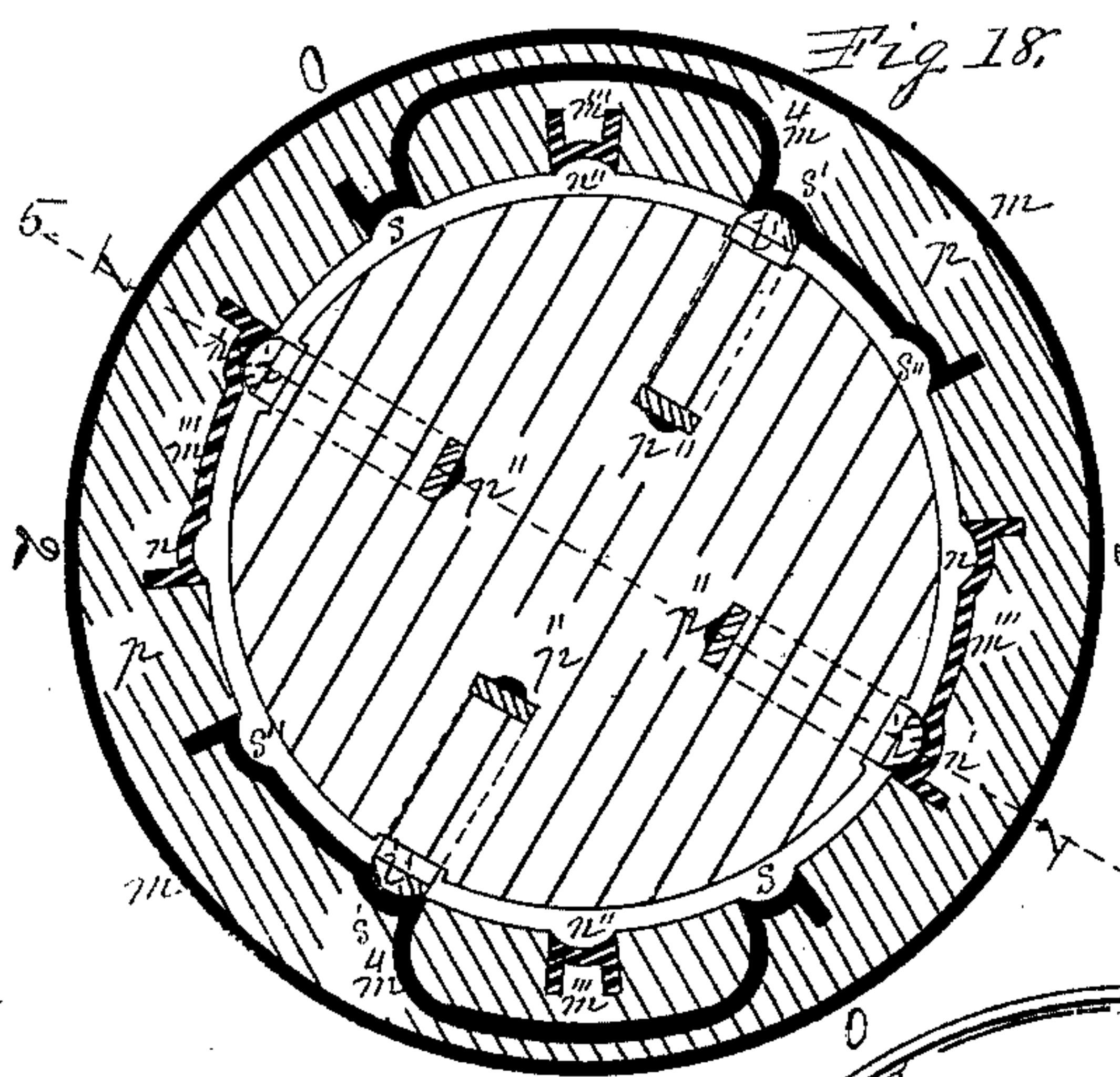
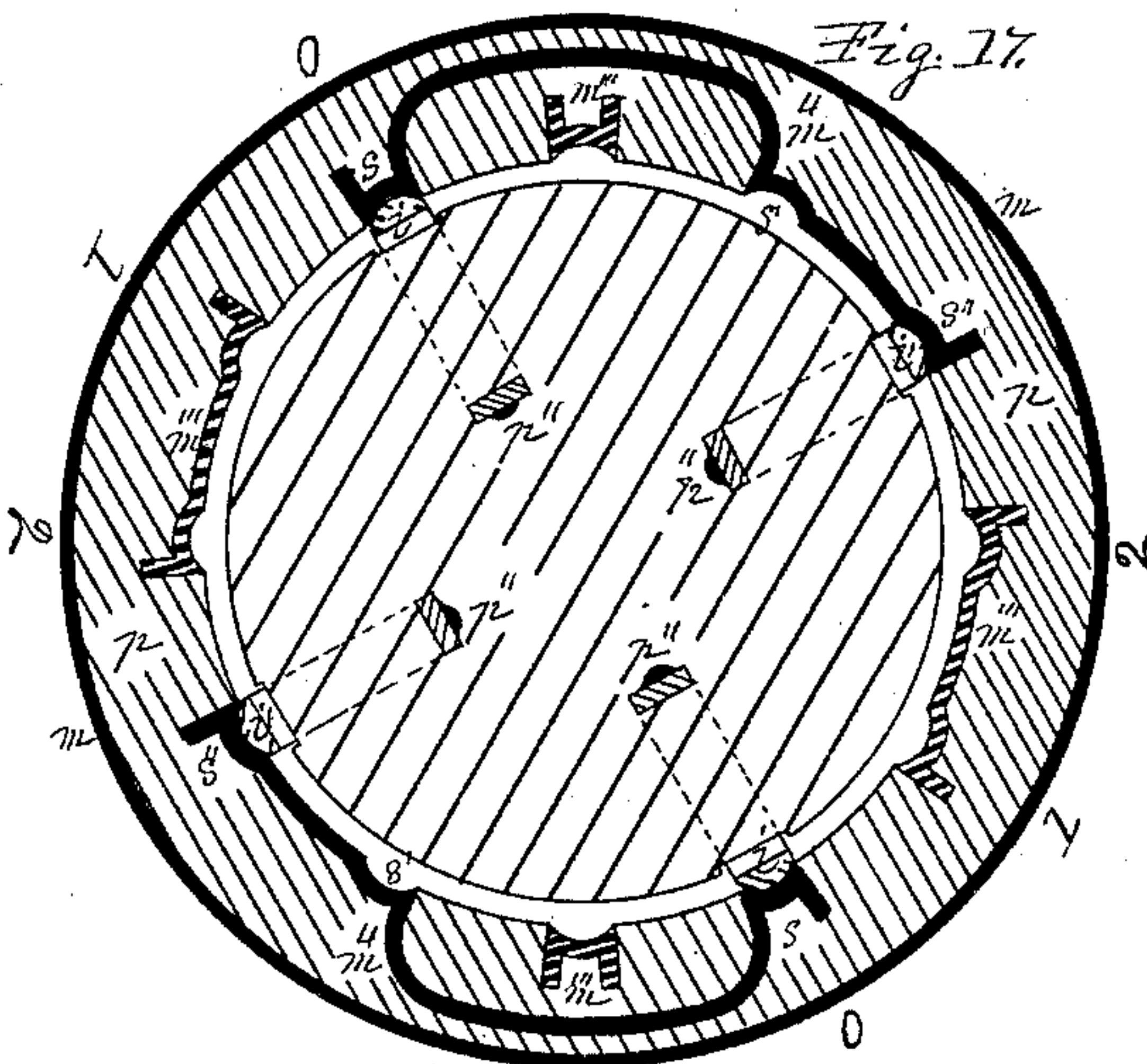
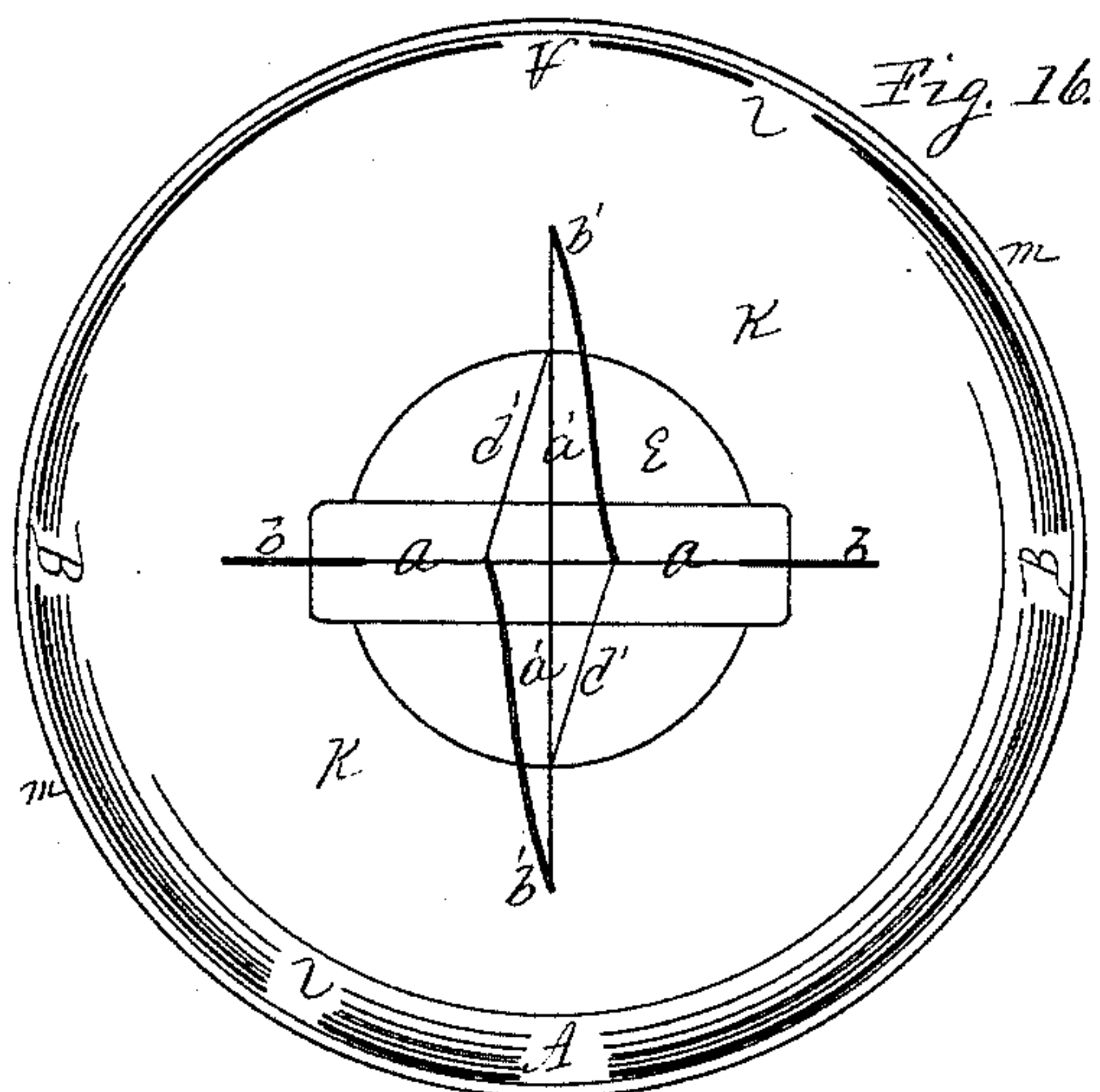
Witnesses,
A. O. Behel
O. A. D. Behel.

Inventor
John Nelson.
Per Jacob Behel, Atty.

J. NELSON.
INCANDESCENT ELECTRIC LAMP.

No. 327,578.

Patented Oct. 6, 1885.



Witnesses,
A. Behel
D. A. B. Behel.

Inventor,
John Nelson.
Per. Jacob Behel, Atty.

UNITED STATES PATENT OFFICE.

JOHN NELSON, OF ROCKFORD, ILLINOIS.

INCANDESCENT ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 327,578, dated October 6, 1885.

Application filed February 9, 1883. Serial No. 84,445. (No model.)

To all whom it may concern:

Be it known that I, JOHN NELSON, a citizen of the United States, residing in the city of Rockford, in the county of Winnebago and State of Illinois, have invented new and useful Improvements in Electric Lamps, of which the following is a specification.

My invention relates to that class of electric lamps known as "incandescent lamps," in which the incandescing conductor is inclosed in a glass globe or casing hermetically sealed. In this class of electric lamps the incandescing conductor employed is usually of a curving bow-form generally known as the "horseshoe" incandescing conductor, and so far as known to me but one of such conductors is employed in a lamp; and the construction of this class of lamps is such that when the incandescing conductor becomes broken, or from any cause becomes unfit for use, the lamp is of no further use and cannot be repaired with profit. Further, these lamps in their construction have a limited light-giving capacity, which in the use of the finished lamp cannot be varied to any considerable extent with profit.

To improve this class of lamps in these and other particulars, to render them capable of use a greater length of time with a like light-giving capacity, or to increase their light-giving capacity in various degrees for a like or greater length of time is the object of this invention, all of which will be hereinafter more fully described.

In the accompanying drawings, Figure 1 is an elevation of an incandescing electric lamp containing three incandescing conductors placed in separate planes parallel to each other, and in which the features of my improvements are embodied in one form. Fig. 2 is a central vertical section on dotted line 1. Fig. 3 is a plan view with incandescing conductors placed parallel with each other. Fig. 4 is a plan view of the socket to receive the shank of the lamp. Figs. 5, 6, 7, and 8 are transverse sections on dotted line 2, Fig. 2, showing the different positions of the lamp in the socket. Fig. 9 is an isometrical vertical central section of the socket on dotted line 3, Fig. 4. Fig. 10 is an isometrical representation of the shank of the lamp designed to enter the socket. Fig. 11

is an isometrical representation of the grooved metallic circuit-closing plate of the socket. Fig. 12 is an isometrical representation of the grooved metallic non-circuit-closing plate of the socket. Fig. 13 is an isometrical representation of one of the metallic circuit-closing springs of the lamp-shank. Fig. 14 is a plan view of a lamp containing three incandescing conductors placed in the form of the letter H. Fig. 15 is a vertical central section of a lamp containing two incandescing conductors placed in the form of a cross at right angles to each other in the same globe. Fig. 16 is a plan view of the lamp shown at Fig. 15. Figs. 17, 18, and 19 are transverse sections on dotted line 4, Fig. 15, showing the different positions of the lamp in the socket. Fig. 20 is a vertical central section of a lamp containing two incandescing conductors, one placed within the other in the same vertical plane.

In the figures in the accompanying drawings *a*, *a'*, and *a''* represent incandescing conductors or carbons of the usual well-known horseshoe form. These carbons are fixed at their end portions to suitable metallic supports, *b*, *b'*, and *b''*, in pairs, in this instance produced from copper in a manner to embrace the end portions of the carbon. These copper supports are suitably joined to platinum wires *c*, *c'*, and *c''* in pairs. These platinum wires are suitably joined in pairs to copper conducting-wires *d*, *d'*, and *d''*. These conducting-wires are placed in a glass tube, *e*, in such a manner that their intermediate platinum wires *c*, *c'*, and *c''* shall be in the end portion of the tube properly separated in pairs, in which separate position they are fixed by melting and sealing the end portion of the glass tube round the platinum wires. This tube is then placed in the neck of a glass globe, *f*, in such position that the carbons shall occupy a central position in the globe, in which position they are fixed by melting the neck end of the globe, by which means it is fixed to the open-end portion of the tube. The conducting-wires *d*, *d'*, and *d''*, in pairs corresponding to their respective carbons, are separated to opposite sides of the tube, and these pairs are placed at equal divisions on the inner surface thereof, in which position

they are supported by means of a cork, *h*, inserted into the open end of the tube, which serves to press the wires against the tube and hold them in their relative position.

5 At *i*, *i'*, and *i''* are represented circuit-closing spring-bars produced from suitable metallic material, having their inner ends bent in suitable hook form, substantially as represented in Fig. 10, as a means by which to fix
10 them in the shank of the lamp. The conducting-wires *d*, *d'*, and *d''* are suitably joined to the inner hook-end of these circuit-closing springs. These circuit-closing springs, with the conducting-wires attached, are arranged
15 at equal distances in pairs at opposite sides of a circle of proper diameter around the neck of the lamp, in which position they are fixed by means of a filling, *k*, of plaster-of-paris or other suitable non-conducting material, forming a
20 cylindrical neck or shank to the lamp, having the circuit-closing spring-bars *d*, *d'*, and *d''* placed upon its periphery in pairs on opposite sides, and the several spring-bars placed at substantially equal distances from each
25 other and in the lengthwise direction of the shank. In this construction and arrangement the several pairs of circuit-closing spring-bars are designated by letters of the alphabet placed on the outer rim, *l*, of the cylindrical
30 shank of the lamp, reading in their order from left to right, and in this instance, when three carbons are employed, A represents one of the outside carbons, *a*; B, the center carbon, *a'*, and C the outer carbon, *a''*.

35 At *m* is represented the metallic outer casing of the lamp having one of its ends at *m'* reduced in size and internally screw-threaded to receive the screw-threaded end of a gas-pipe support.

40 At *m''* are represented the segment-formed end portions of the circuit-closing or contact plates, from the outer curved edge of which rise, at proper intervals and of proper width, the circuit-closing or contact plates *m'''*, corrugated
45 or grooved on their inner surface at *n*, *n'*, *n''*, *n'''*, *n⁴*, and *n⁵* to receive the circuit-closing springs *i*, *i'*, and *i''* of the shank of the lamp.

At *m⁴* are represented non-conducting contact-plates, corrugated or grooved on their inner surface at *s*, *s'*, *s''*, *s'''*, *s⁴*, and *s⁵* to receive the
50 the circuit-closing springs *i*, *i'*, and *i''* of the shank of the lamp. These several corrugated or grooved plates are placed in the metallic socket concentric therewith, and in such position that the corrugations or grooves shall
55 be at equal intervals in a circle of proper diameter to receive the shank of the lamp snugly, and in such position therein that the respective pairs of the corrugations or grooves of the respective pairs of plates shall be at
60 opposite sides of the socket in position to receive the respective pairs of circuit-closing springs on the opposite sides of the shank of the lamp. In this position the several corrugated or grooved plates are fixed in the metallic socket by means of a suitable filling, *p*,

of plaster-of-paris or other non-conducting material, forming a socket to receive the shank of the lamp, in such a manner as to put into the electric circuit any one, two, or more of
70 the incandescing conductors or carbons contained in the lamp.

At *p'* are represented clamping-screws, one of which is placed in the segment end *m''* of each of the corrugated or grooved circuit-closing plates.

At *p''* are represented the insulated main conducting-wires, designed to have a suitable end connection with the electric generator, and each wire properly connected with one of
80 the segment end portions, *m''*, of the two corrugated circuit-closing plates by means of the clamping-screws, which, when the lamp is properly in place in the socket, will complete the circuit. The socket, near its upper edge,
85 is numbered 0, 1, 2, and 3, reading from left to right, as represented on the opposite sides of the several figures from 4 to 9, inclusive, in which the 0 or zero-point is placed radially opposite the single groove *s* in the non-conducting corrugated plates *m⁴*, and the numbers
90 1, 2, and 3 are placed radially opposite the groups of the three grooves *n n' n''* in the circuit-closing plates *m'''*.

In the figures from 17 to 19, inclusive,
95 where but two incandescing conductors or carbons are employed, the 0 or zero-point is placed radially opposite the single groove *s* in the non-conducting corrugated plates *m⁴*, and the numbers 1 and 2 are placed radially opposite the groups of the two grooves *n n'* in the circuit-closing plates *m'''*.

From the foregoing it will be seen that if the lamp be placed in the socket in such position that the letter A on the outer rim of the lamp-shank is over the numeral 1 on the upper portion of the socket, then the outside carbon, *a*, corresponding to the letter A, will be in circuit.
105 If the letter B on the shank is placed over the numeral 1 on the socket, the central carbon, *a'*, corresponding to the letter B, will be in circuit, and if the letter C on the shank is placed over the numeral 1 on the socket, the outside carbon, *a''*, corresponding to the letter C, will be in circuit. From which it will be seen that
110 any one of the several carbons *a*, *a'*, and *a''*, corresponding to the letters A, B, and C, may be placed in circuit independently.

If the letter A on the shank is placed over the numeral 2 on the socket, the outside carbons, *a* and *a''*, corresponding to the letters A and C on the shank, will be in circuit. If the letter B on the shank is placed over the numeral 2 on the socket, the carbons *a* and *a'*, corresponding to the letters A and B, being one
120 outside and center carbons, will be in circuit.

If the letter C on the shank is placed over the numeral 2 on the socket, then the carbons *a'* and *a''*, corresponding to the letters B and C on the shank, being the center and one outside
125 carbons, will be in circuit. If any one of the letters A, B, or C on the shank is placed over

the numeral 3 on the socket, all three of the carbons *a*, *a'*, and *a''*, corresponding to the letters A, B, and C, will be in circuit.

If any one of the letters A, B, and C on the shank of the lamp are placed over 0, the zero-point on the socket, all of the carbons *a*, *a'*, and *a''* will be out of circuit.

From the foregoing it will be seen that in my improved lamps containing two or three carbons any one, or any two, or all of the carbons may be placed in the circuit. If in the use of my improved lamp but one of the carbons is placed in the circuit at the same time, and when such carbon is rendered unfit for use another is placed in the circuit, the life of the lamp will be in proportion to the number of carbons incased in the globe; and if more than one carbon is placed in the circuit with a proper current to produce the required incandescence, the quantity of light produced will be in proportion to the number of carbons placed in the circuit. From which it will be seen that comparatively at a small additional first cost I produce a lamp capable of greater usefulness than lamps of its class heretofore produced containing but one carbon. In this instance I have illustrated a lamp containing two carbons and another containing three carbons; but evidently lamps containing more carbons may be constructed, and the relative position of the several carbons contained in the globe may be varied from those shown and described; and the form of the globe to contain the carbons may be varied to better adapt it to contain more carbons va-

riously located within the globe; but these and like modifications will be within the scope of my invention so long as two or more carbons contained within the same globe are capable of joint or independent use for the purpose of prolonging the life of the lamp or for increasing its lighting capacity.

I claim as my invention—

1. A lamp-receiving socket having a suitable conducting-connection with the electric generator, said socket provided with a corrugated or grooved circuit-closing surface and a corrugated or grooved non-circuit-closing surface to engage the circuit-closing surface of a lamp, substantially as and for the purpose hereinbefore set forth.

2. The combination, with a lamp-receiving socket provided with a corrugated or grooved circuit-closing surface and a corrugated or grooved non-circuit-closing surface, of a lamp having a shank provided with circuit-closers adapted to engage the circuit-closing and non-circuit-closing surface of the socket, substantially as and for the purpose hereinbefore set forth.

3. The combination, with the circuit-closers of the lamp and with the circuit-closing and non-circuit-closing surface of the socket, of the index-letters and numerals, or their equivalents, substantially as and for the purpose set forth.

JOHN NELSON.

Witnesses:

JACOB BEHEL,
S. A. D. BEHEL.