

(No Model.)

2 Sheets—Sheet 1.

W. R. ROTHWELL.  
CIPHER DEVICE.

No. 506,731.

Patented Oct. 17, 1893.

FIG: 1

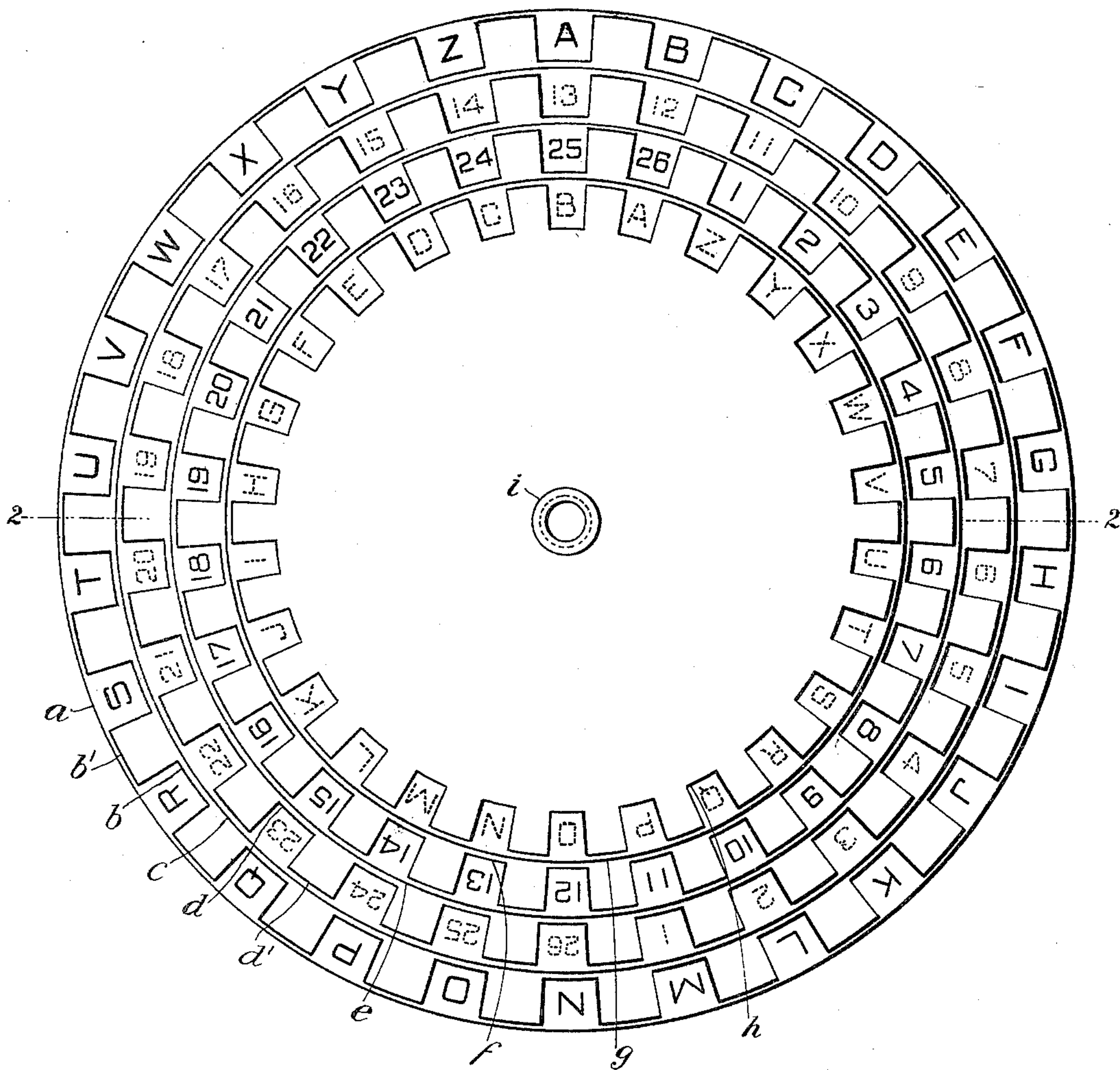
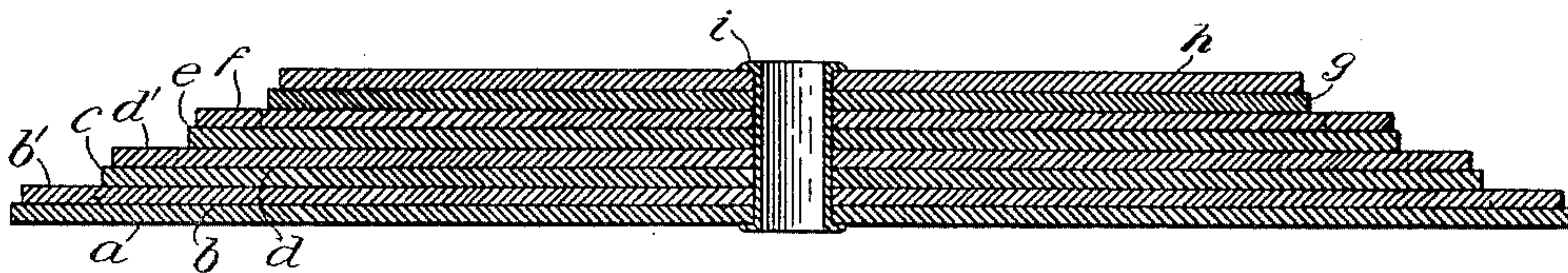


FIG: 2



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INVENTOR:

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BY J. Walter Douglas.  
ATTY

(No Model.)

W. R. ROTHWELL.  
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2 Sheets—Sheet 2.

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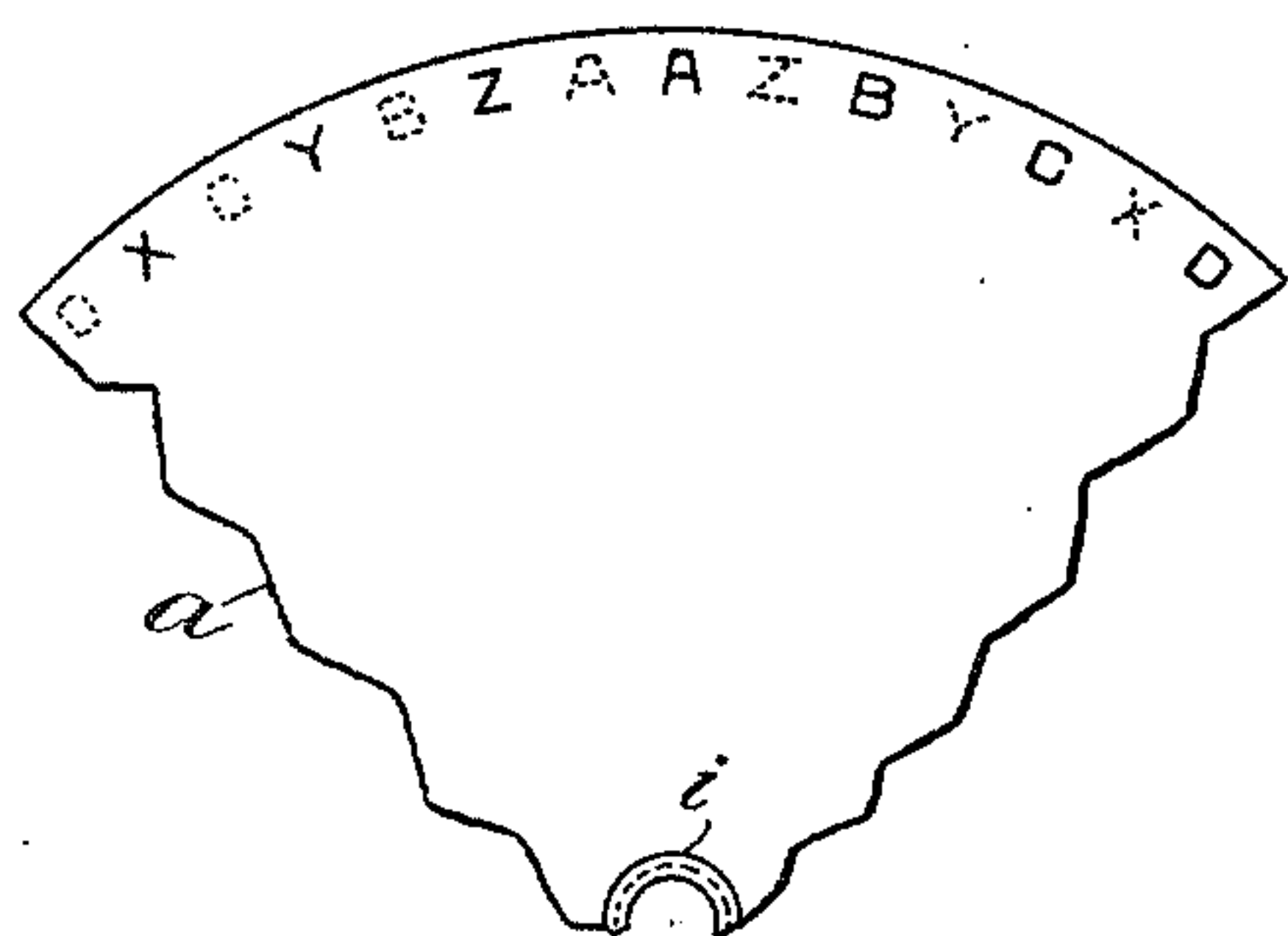


FIG. 3

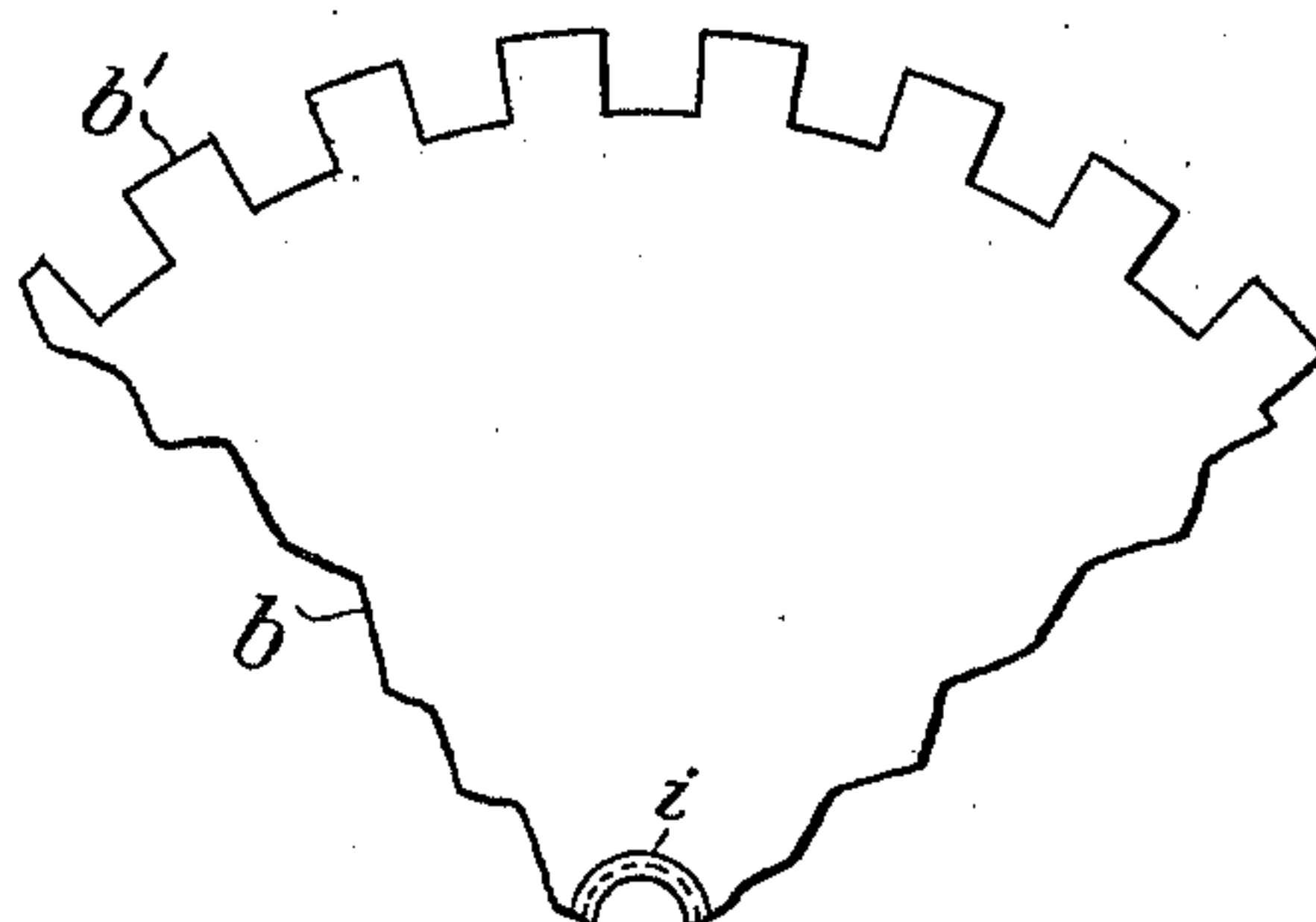


FIG. 7

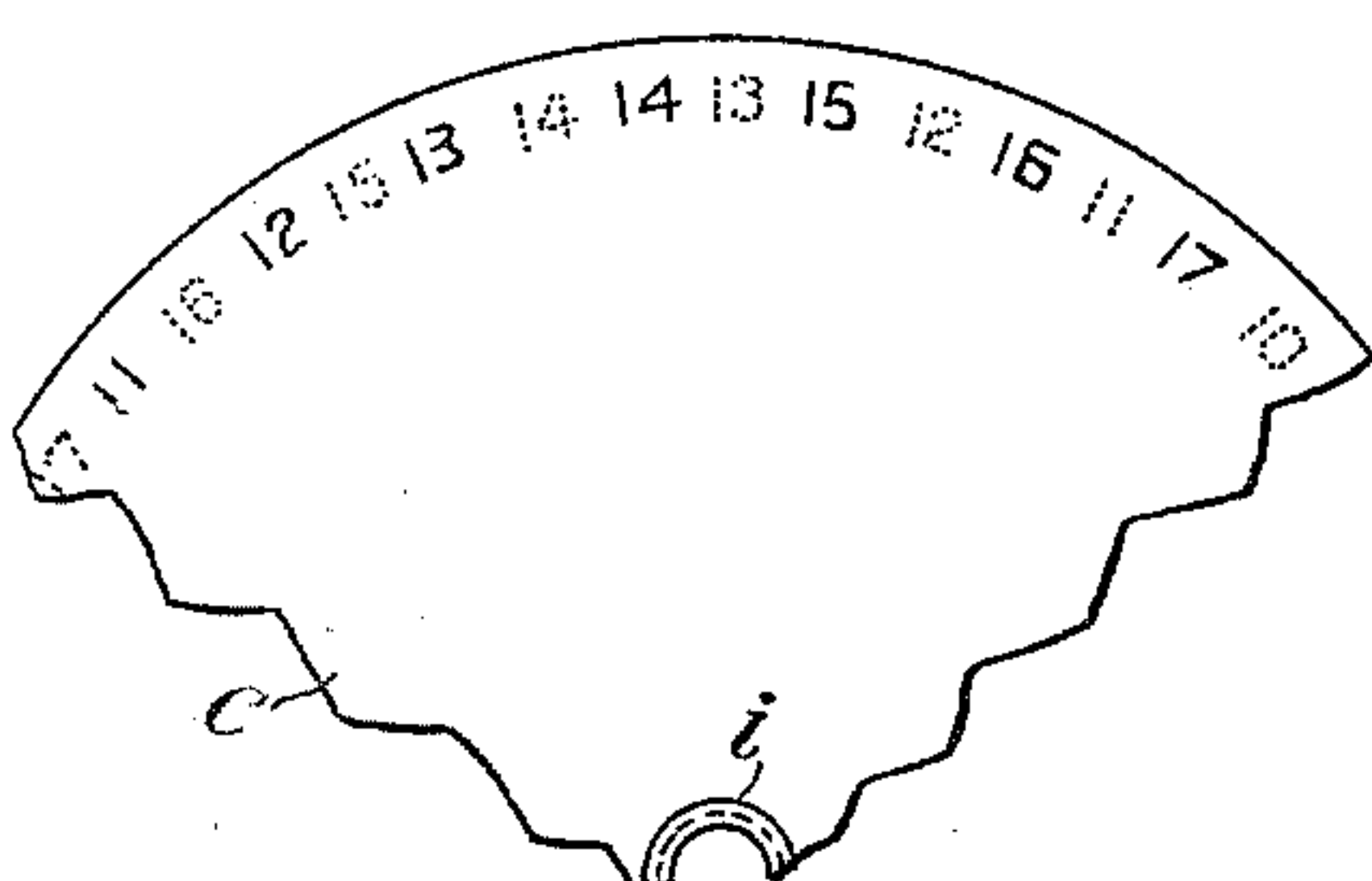


FIG. 4

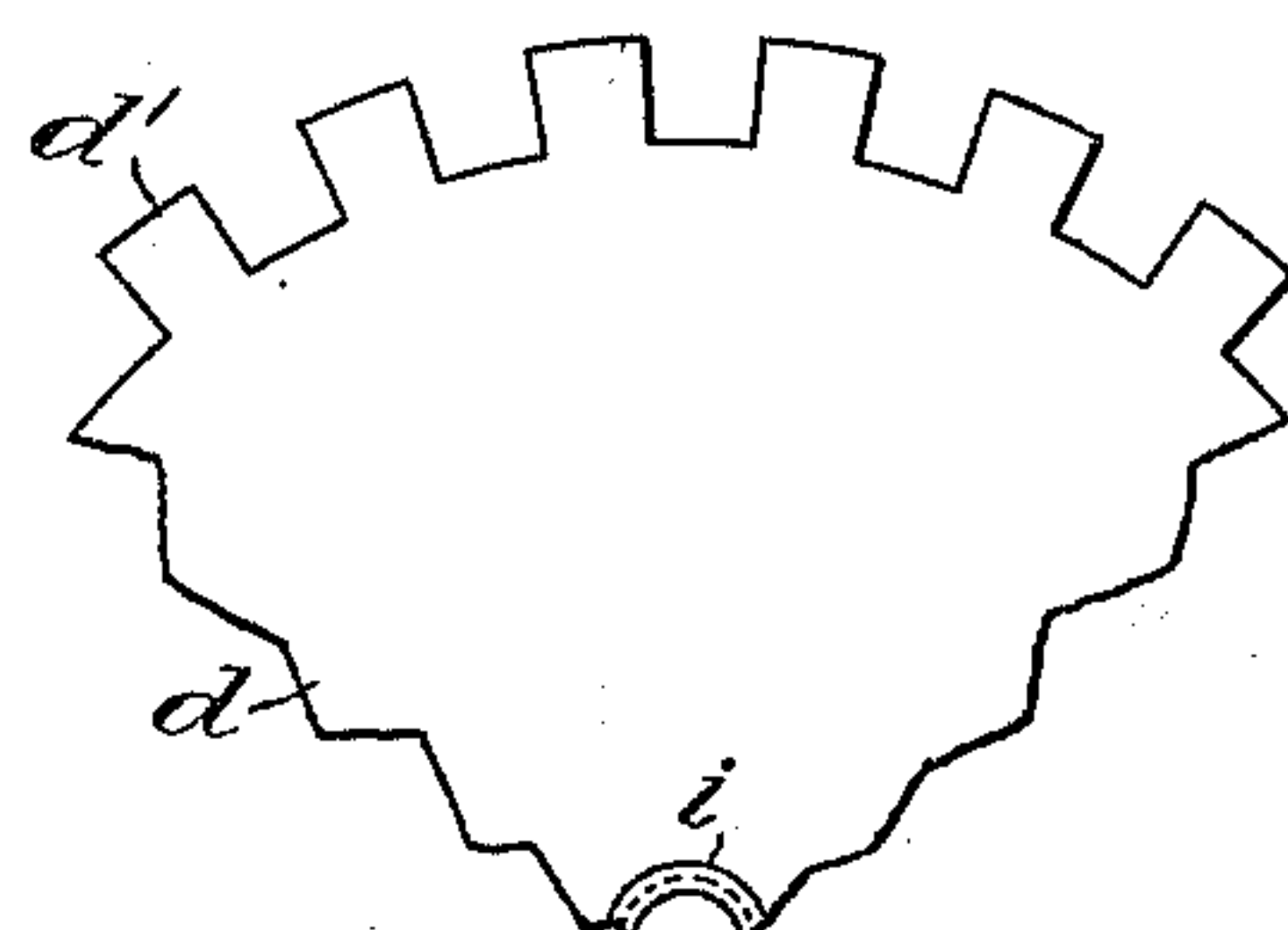


FIG. 8

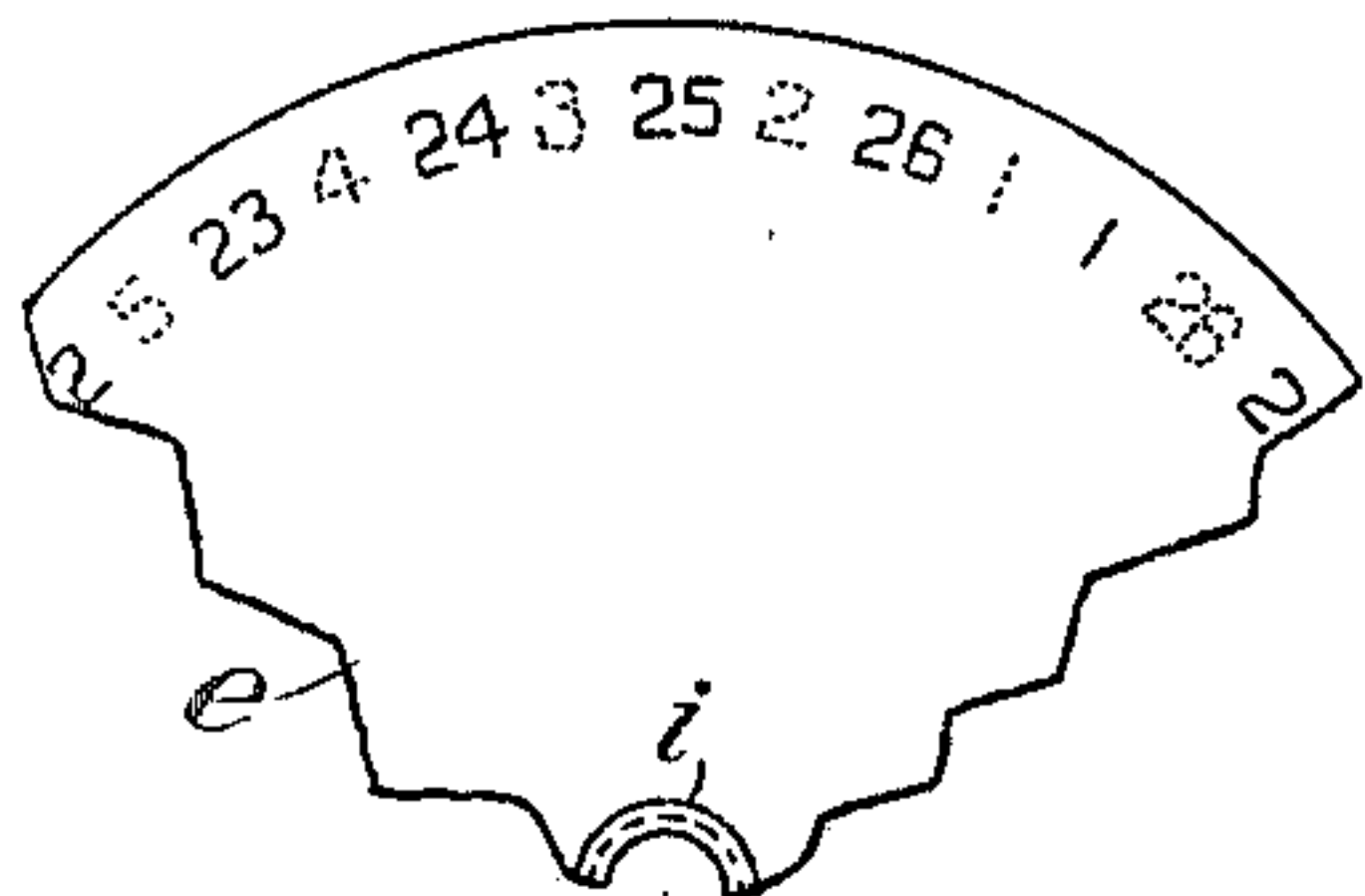


FIG. 5

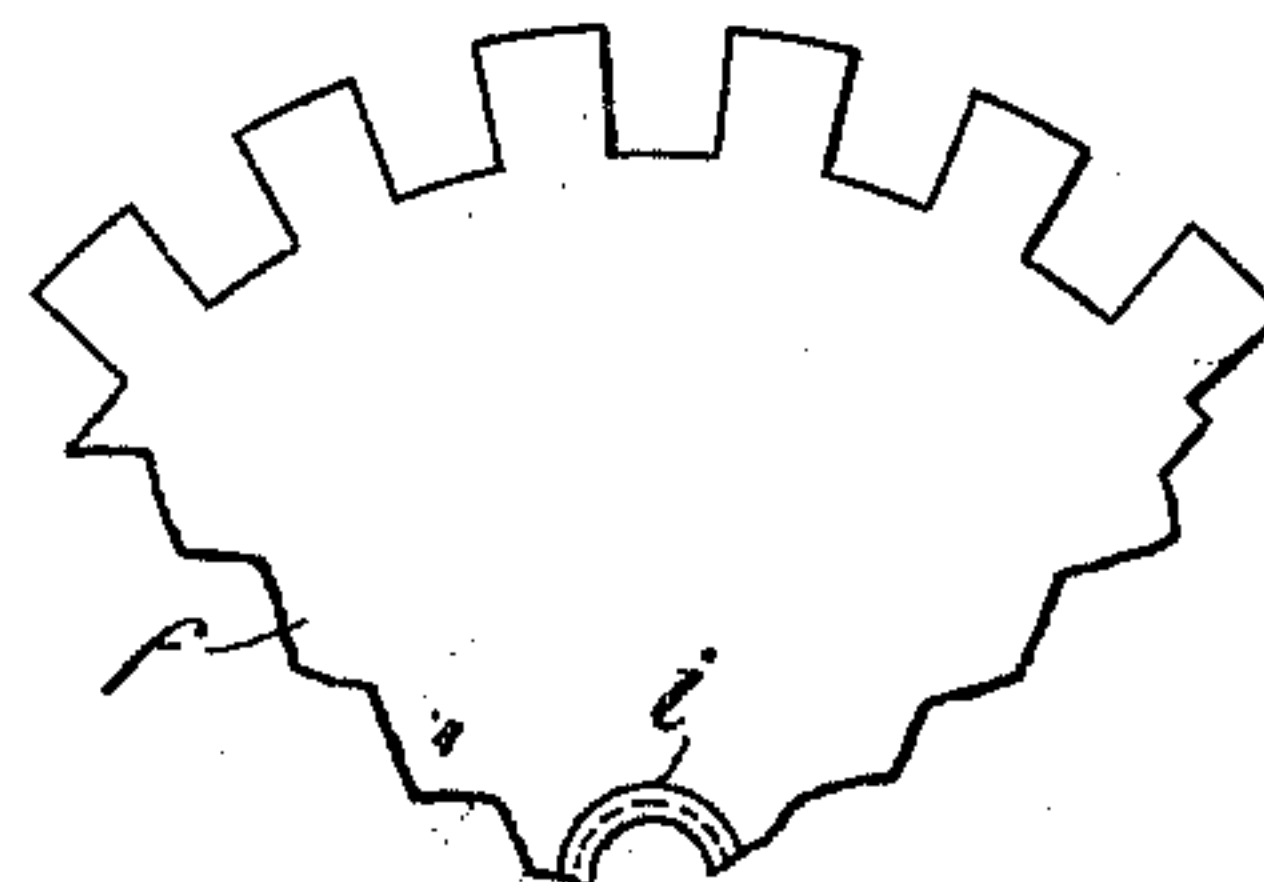


FIG. 9

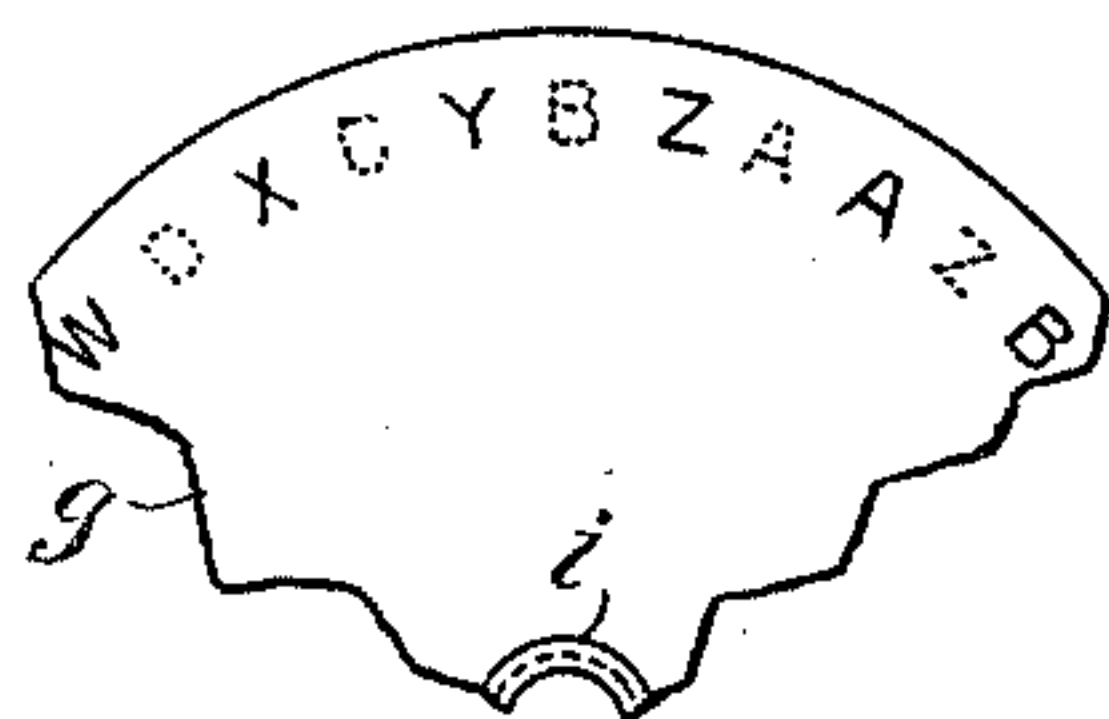


FIG. 6

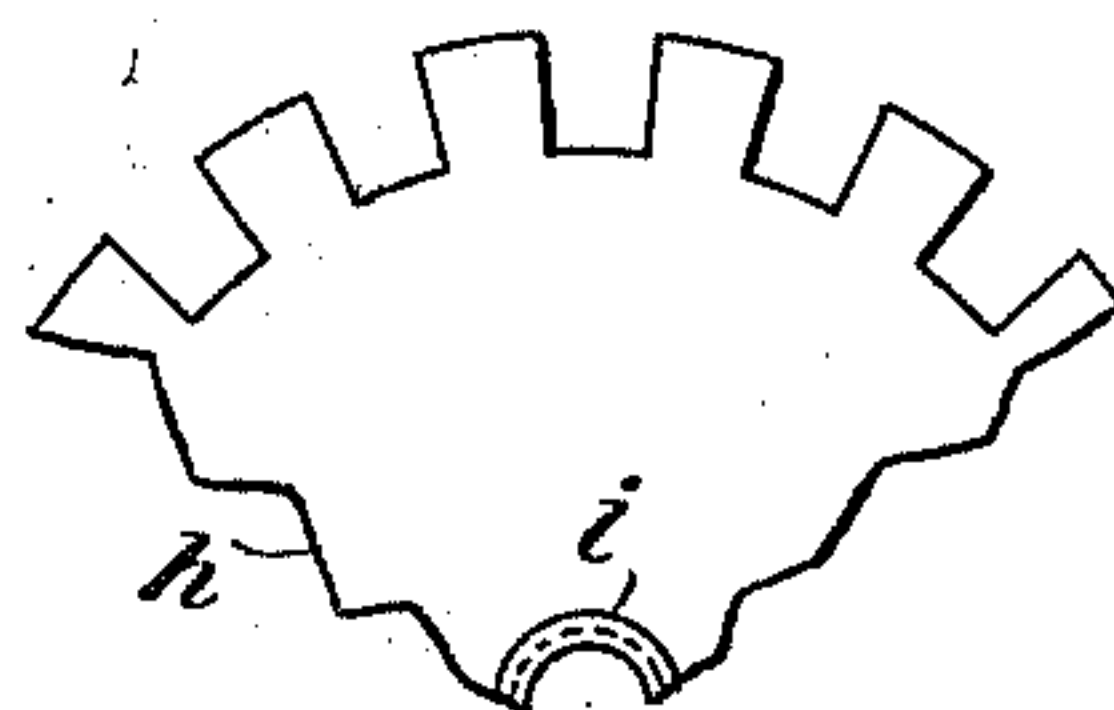


FIG. 10

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# UNITED STATES PATENT OFFICE.

WILLIAM R. ROTHWELL, OF PHILADELPHIA, PENNSYLVANIA.

## CIPHER DEVICE.

SPECIFICATION forming part of Letters Patent No. 506,731, dated October 17, 1893.

Application filed February 21, 1893. Serial No. 463,187. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM R. ROTHWELL, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Cipher Devices, of which the following is a specification.

The principal object of my invention is to provide a simple, durable and comparatively inexpensive device of which the parts when arranged according to one of a very large number of possible keys or combinations afford reliable and accurate means for readily converting manuscript or language into cipher and cipher into manuscript or language.

My invention consists of the improvements in cipher devices hereinafter described and claimed.

The nature and general features of my invention will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof; and in which—

Figure 1, is a top or plan view of a cipher device embodying features of my invention. Fig. 2, is a transverse section taken on the line 2—2, of Fig. 1. Figs. 3, 4, 5 and 6, are detached views of portions of each of the character disks illustrated in Fig. 1; and Figs. 7, 8, 9 and 10, are similar views of portions of each of the blank disks illustrated in Fig. 1.

In the drawings *a*, is a carrier provided upon its face with characters or signs. In the present instance this carrier comprises a disk provided with two sets of letters arranged in alphabetical order and proceeding respectively toward the right and toward the left, Fig. 3. The letters of these two sets may for convenience be distinguished from each other in any suitable manner, but in the present instance the alphabet of which the letters proceed toward the right is indicated by full lines, as illustrated in Figs. 1 and 3, and the alphabet of which the letters proceed toward the left is indicated by dotted lines, as illustrated in Fig. 3.

*b*, is a blank provided with radial fingers *b'*, Figs. 1 and 7, corresponding in number with the letters of each set on the disk *a*, and adapted to cover the letters of one set and expose the letters of the other set of the device.

*c*, is a disk provided upon its face with characters or signs that differ from the characters or signs upon the disk *a*. In the present instance the disk *c*, is provided upon its face with numerals from 1 to 26 inclusive and displayed in regular sequence toward the right and toward the left, as illustrated in Fig. 4.

The set of numerals which proceeds toward the right is indicated by full lines, Fig. 4, and the set of numerals which proceeds toward the left is indicated by dotted lines, Figs. 1 and 4.

*d*, is a blank provided with radial arms *d'*, corresponding in number with the numerals in each set on the disk *c*.

*e*, Fig. 5, is a disk similar in all respects to the disk *c*, and provided with a blank *f*, (Fig. 9) and similar to the blank *d*.

*g*, Figs. 1 and 6, is a disk similar in all respects to the disk *a*, and provided with a blank *h*, Figs. 1 and 10, similar to the blank *b*, Fig. 7.

The disks *a*, *c*, *e* and *g*, and the blanks *b*, *d*, *f* and *h*, are preferably mounted upon a spindle or stud *i*, and are of gradually decreasing size, as shown, in order that the characters or signs upon all of them may be readily visible.

The mode of operation of the hereinabove described cipher-device, is as follows:—In converting language or manuscript into cipher or cipher into manuscript or language the disks and blanks are positioned according to a predetermined key or formula previously agreed upon by and known only to the users of the device. The number of possible keys or combinations is numerous, in fact, practically unlimited, because it depends upon the number of different relative positions that the disk may be caused to assume. Hence it is practically impossible for any one knowing the cipher only to experimentally determine the key by manipulating the device. However for the sake of a further description, it will be assumed that the key or formula requires that A in full lines on the disk *a*, 13 in dotted lines on the disk *c*, 25 in full lines on the disk *e*, and B in dotted lines on the disk *g*, should be placed in alignment. This result is accomplished by shifting the blank appertaining to each disk into position for covering or concealing the characters on the several disks which are not required, and then shifting the disks into the required positions to expose to view the characters or signs re-



quired to constitute the key. Under these circumstances language or manuscript may be converted into cipher in the following manner. Assuming that the characters or signs of the disk *a*, appertain to language or manuscript and that the characters or signs of the disk *g*, appertain to cipher, and also that the word "Colorado" is to be expressed in cipher, the mode of using the device would be as follows:—The numeral on the disk *c* opposite the first letter of the word "Colorado," to-wit: C, is 11. The letter on the disk *g* opposite the numeral 11 on the disk *e*, is P, so that P, is the first letter of the cipher. The other letters of the word "Colorado" are expressed in cipher by noting the numbers on the disk *b*, opposite the same and then noting the letters in the disk *g* opposite the corresponding numbers on the disk *e*, and will be found to be as follows:—B Y B E N Q B, so that "P B Y B E N Q B" is the cipher for "Colorado." The cipher may be expressed in language by proceeding in a reverse manner, that is, by noting the numerals on the disk *e*, opposite the letters on the disk *g*, and then noting the letters on the disk *a* opposite the corresponding numerals on the disk *c*.

It may be remarked that very complicated and elaborate keys and ciphers may be employed and many modifications made in the details, for example, in the characters and signs employed, or the device may be constructed of carriers arranged to slide instead of revolving around and around and the characters or signs may be displayed differently than has been illustrated in the drawings, without departing from the spirit of my invention; and therefore, I do not wish to

limit myself to the precise construction and arrangement of the parts of the device as hereinbefore explained.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A cipher-device, comprising revoluble disks of different sizes provided respectively with characters or signs arranged in reverse directions, and revoluble blanks alternating with said disks and provided respectively with a series of radial fingers adapted to cover and expose alternate characters or signs on an underlying disk, substantially as and for the purposes set forth.

2. A cipher-device, comprising four disks of different sizes respectively provided with characters or signs arranged in reverse directions and two of said disks appertaining to cipher and two to manuscript, blanks alternating with said disks and respectively provided with fingers adapted to cover and expose alternate characters or signs on an underlying disk according to a pre-determined key or formula and a post or spindle for rotatably supporting said blanks and disks to permit certain of the exposed signs or characters to be brought into radial alignment according to said key or formula, substantially as and for the purposes set forth.

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

WM. R. ROTHWELL.

Witnesses:

THOMAS M. SMITH,  
RICHARD C. MAXWELL.