

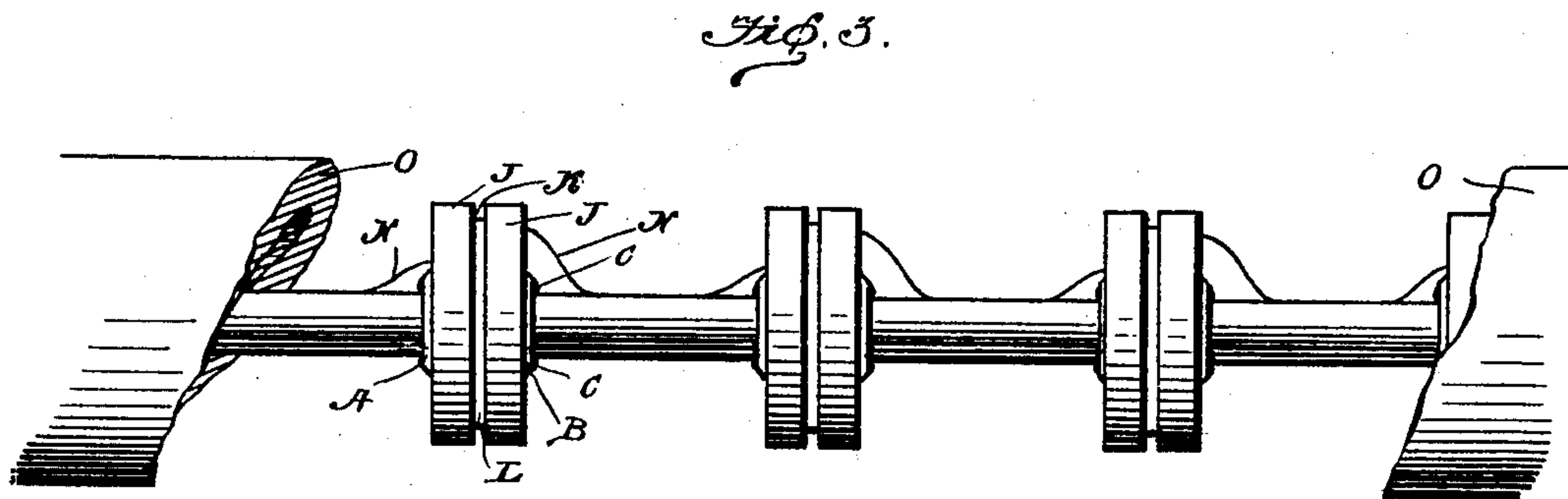
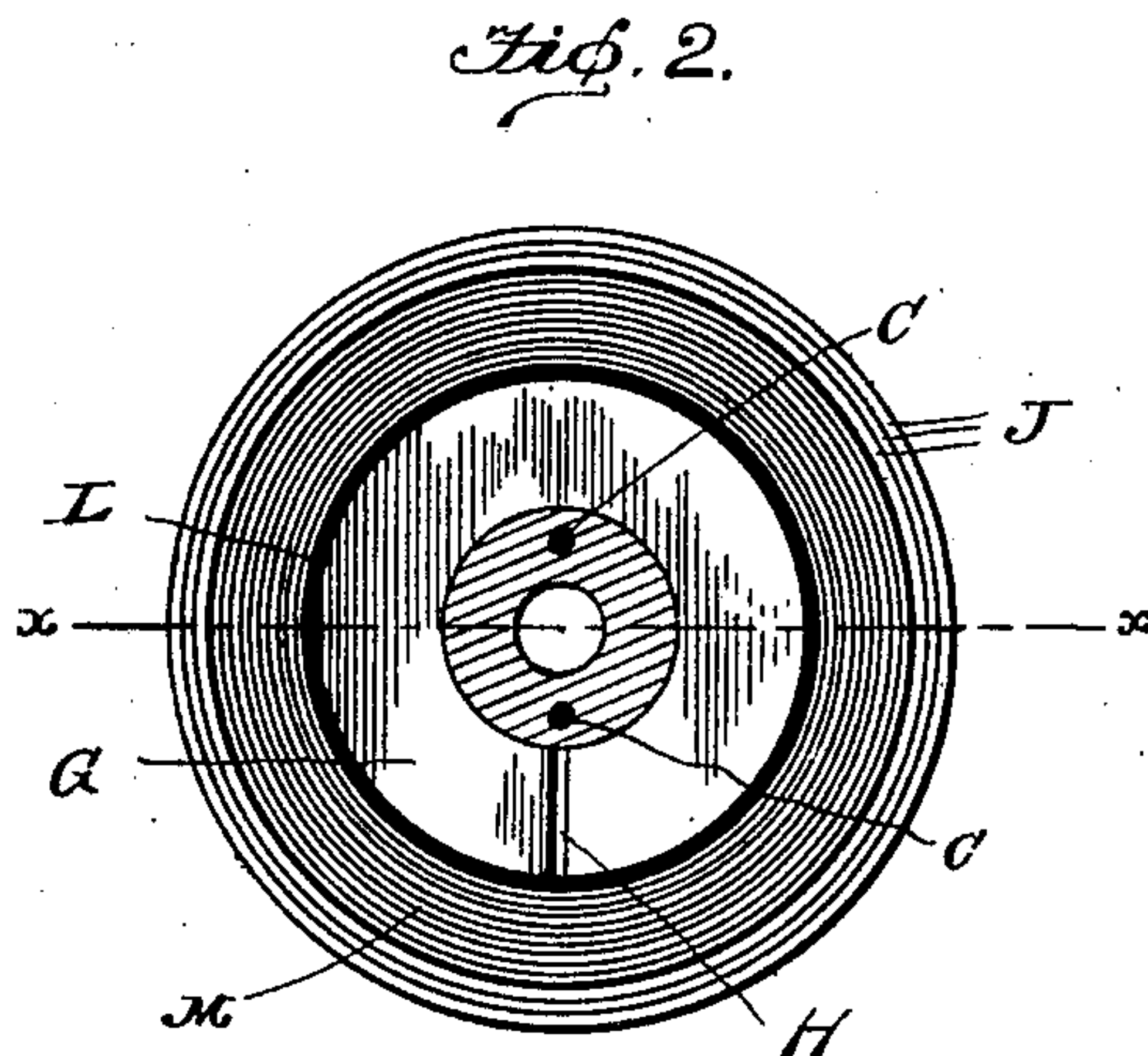
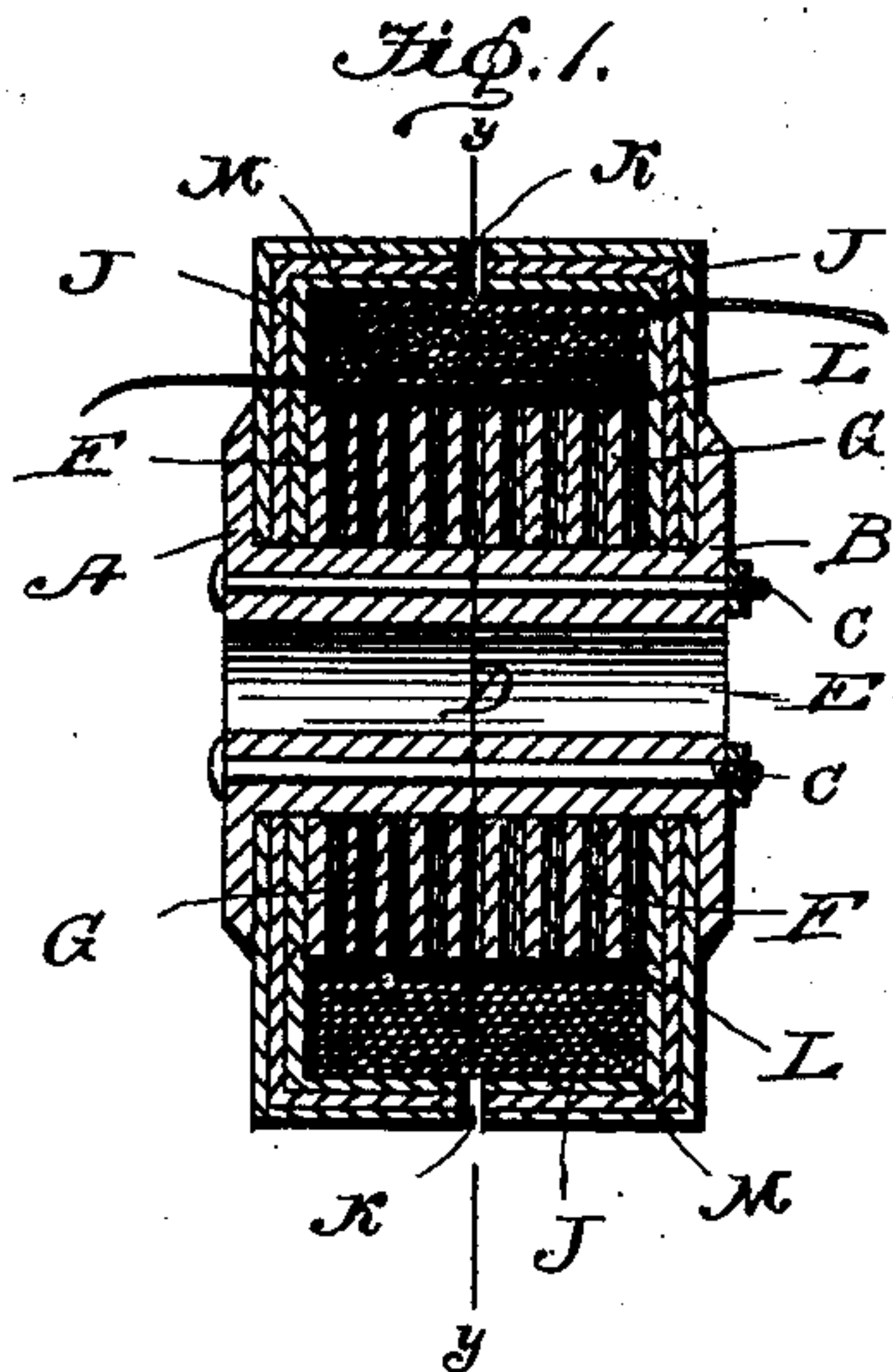
No. 678,353.

Patented July 9, 1901.

H. SHOEMAKER.  
INDUCTANCE COIL.

(Application filed Feb. 8, 1901.)

(No Model.)



Witnesses

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by

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# UNITED STATES PATENT OFFICE.

HARRY SHOEMAKER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO  
GUSTAVE P. GEHRING AND MARIE V. GEHRING, OF SAME PLACE.

## INDUCTANCE-COIL.

SPECIFICATION forming part of Letters Patent No. 678,353, dated July 9, 1901.

Application filed February 8, 1901. Serial No. 46,583. (No model.)

*To all whom it may concern:*

Be it known that I, HARRY SHOEMAKER, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Inductance-Coils, of which the following is a specification.

My invention relates to improvements in inductance-coils; and the main object is to make the magnet-circuit as short as possible and also make it complete, with the exception of an air-gap of very small reluctance.

Another object of my invention is the provision of a coil of this character so constructed as to be easily placed upon cables and made a portion thereof without rendering the same cumbersome.

Another object of my invention is the provision of an inductance-coil which is adapted to be used for telephoning and telegraphing over long distances and lines where high-frequency currents are used without departing from the spirit of my invention.

Another object of my invention is the installation of conductors for the transmission of electrical energy by means of electrical waves, whereby by decreasing the current necessary to transmit the amount of energy required the attenuation of such waves is reduced, and therefore the efficiency of the transmission is increased.

To attain the desired objects, my invention consists of an inductance-coil embodying novel features of construction and combination of parts, substantially as disclosed herein.

In the drawings, Figure 1 is a longitudinal section taken on line  $xx$  of Fig. 2. Fig. 2 is a section taken on line  $yy$  of Fig. 1, and Fig. 3 is a view of a cable with my coils in position thereon.

Referring to the drawings, A designates a wooden or non-conducting section, which, with another non-conducting section B, when tied together by the brass bolts C, forms a spool D, provided with the circular opening or core E. Fitting upon the spool and being separated by the paper disks F are the thin

annealed sheets or disks G of steel, said disks being provided each with a gap or space H, as shown in Fig. 2. Upon each side of these disks and fitting upon the core of the spool are the series of cup-shaped disks J, bent so as to form the magnetic circuit with the small air-gap K between their inner edges, as shown in Fig. 1. Placed around the outer edges of the disks G is an insulation L, around which is wound the coil M, which is adapted to fit in the space or casing between the edges of the disks G and the bent ends of the disks J.

From this description, taken in connection with the drawings, the use of my improved inductance-coil is readily understood, but, briefly stated, it is as follows: The coils are placed upon a cable at stated intervals, as shown in Fig. 3, having the wires N connected with the cable, and as they fit upon the cable so neatly the insulation O can be made to surround the entire coils and cable, and thus produce a cable of uniform thickness throughout its entire length. These coils have the same properties as the coils set forth in Patent No. 652,230, of June 19, 1900. When they are placed upon a cable or wire, the ends of the winding are connected with the cable so as to transmit electrical energy by means of electrical waves, whereby by decreasing the current necessary to transmit the amount of energy required the attenuation of such waves is reduced, and therefore the efficiency of the transmission is increased. It will be seen that the magnetic circuit being short and having an air-gap of small reluctance it allows the changing of the strength of magnetism to take place much quicker than with a long magnetic circuit, and the air-gap in each individual disk end and the paper between them greatly reduce eddy-currents throughout the core.

It is evident that I provide a very simple, durable, and inexpensive inductance-coil which can be used with very great advantage for long-distance telephones or telegraphs where high-frequency currents are used, which can be closed within a suitable insulating-covering to withstand the action of air



and water, and can be placed on cables or wires which pass through the center of the core or coil.

I claim—

5 1. An inductance-coil, comprising a central non-conducting core or spool, a series of metal disks fitting upon said spool and provided with gaps between their ends, cup-shaped metal disks surrounding said spool upon  
10 either end of the disks and having an air-gap between their edges, and a winding mounted upon the disks in the space between them and the bent ends of the cup-shaped disks.

15 2. An inductance-coil, comprising a non-conducting spool, provided with a core to allow the spool to surround the wire or cable, a series of disks provided with an air-gap and a series of cup-shaped disks provided

with an air-gap surrounding said spool, and a coil surrounding the series of disks. 20

3. An inductance-coil, comprising a non-conducting base, a series of thin metal disks having an air-gap between their ends, thin sheets of insulating material fitting between the disks, a series of cup-shaped disks upon 25 the base on each side of the other disks and a winding surrounding the disks in the casing formed by the cup-shaped portion of the other disks.

In testimony whereof I affix my signature 30 in presence of two witnesses.

HARRY SHOEMAKER.

Witnesses:

M. WIEGAND,  
JOSEPH S. HAGAN.