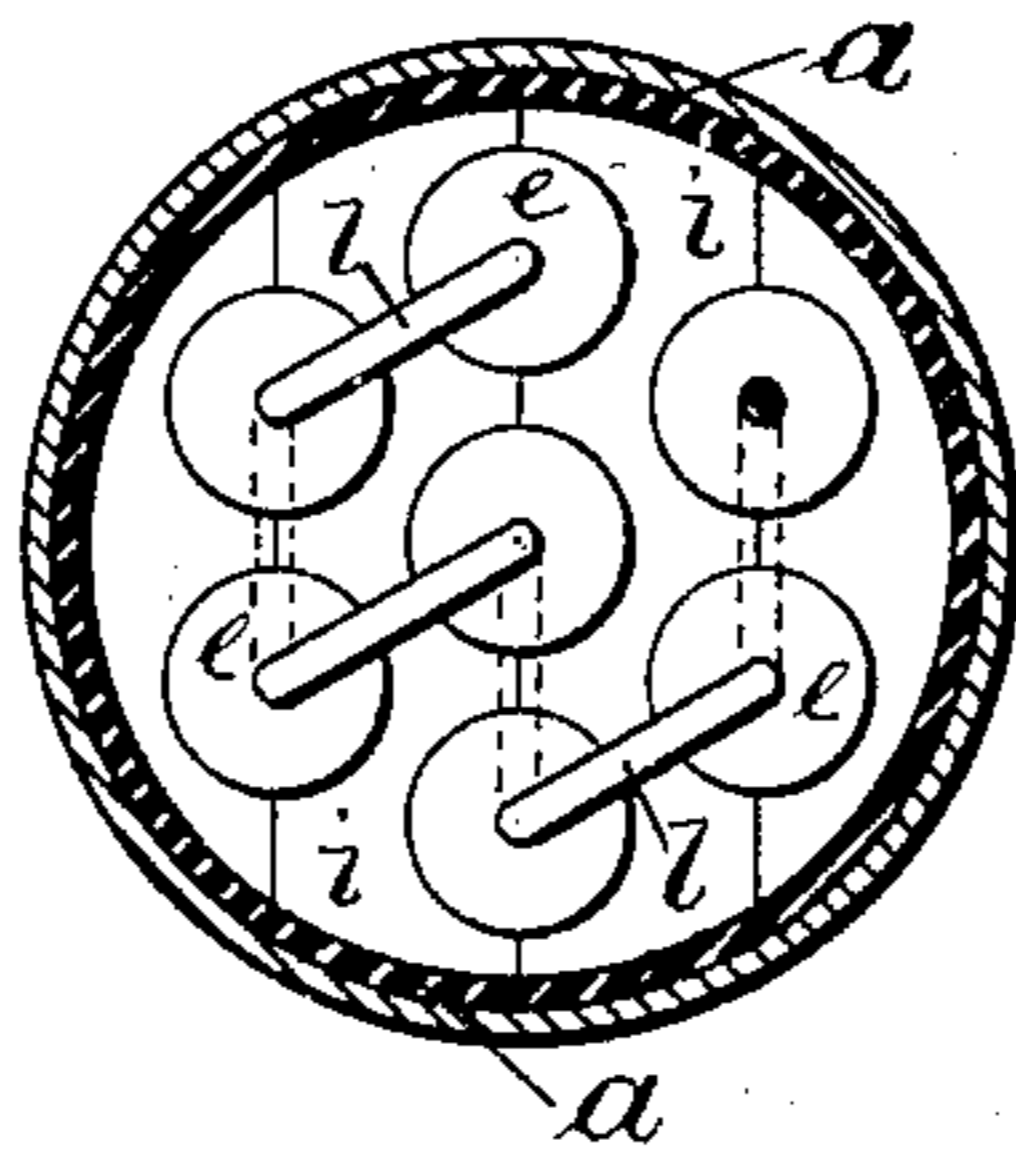
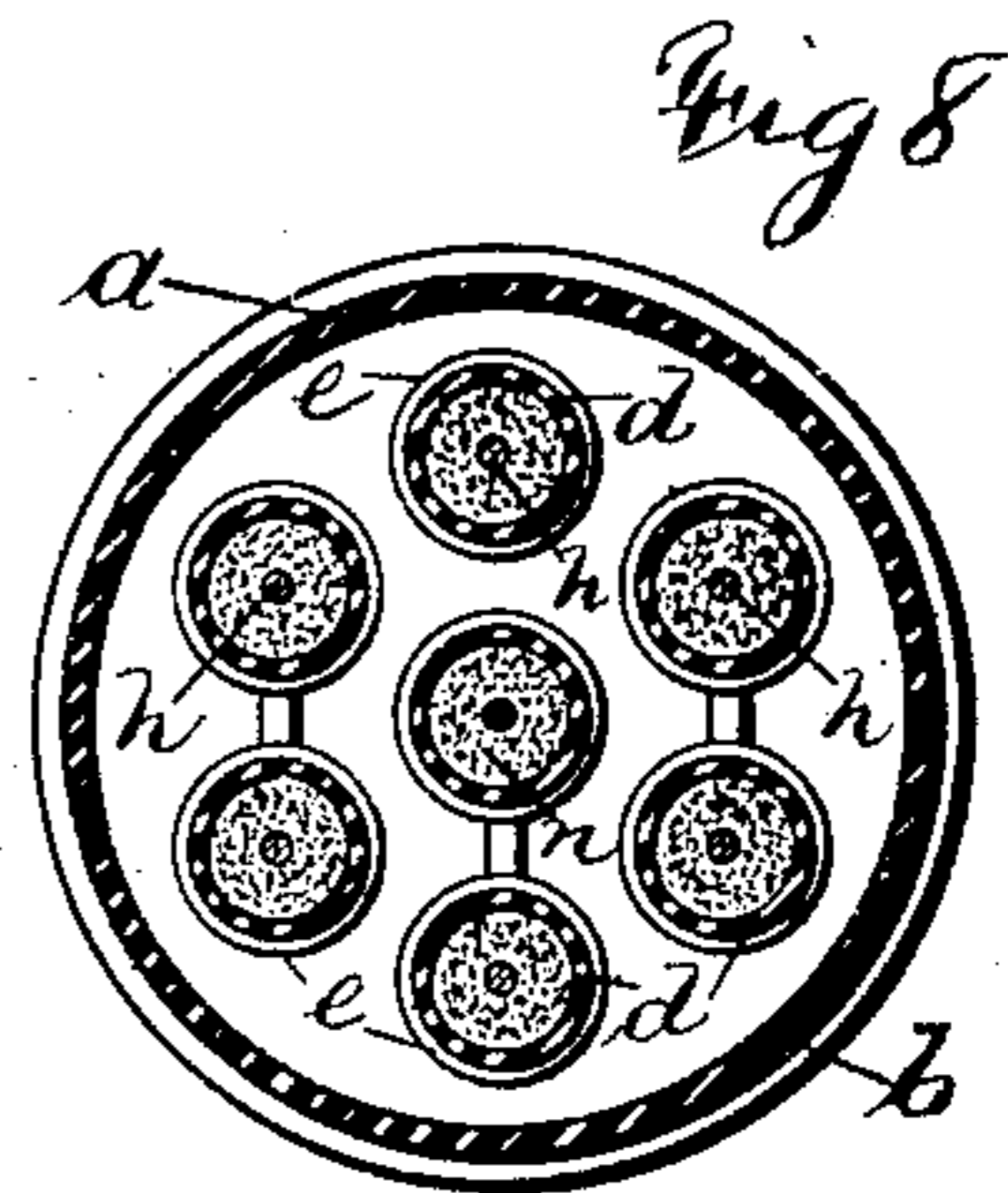
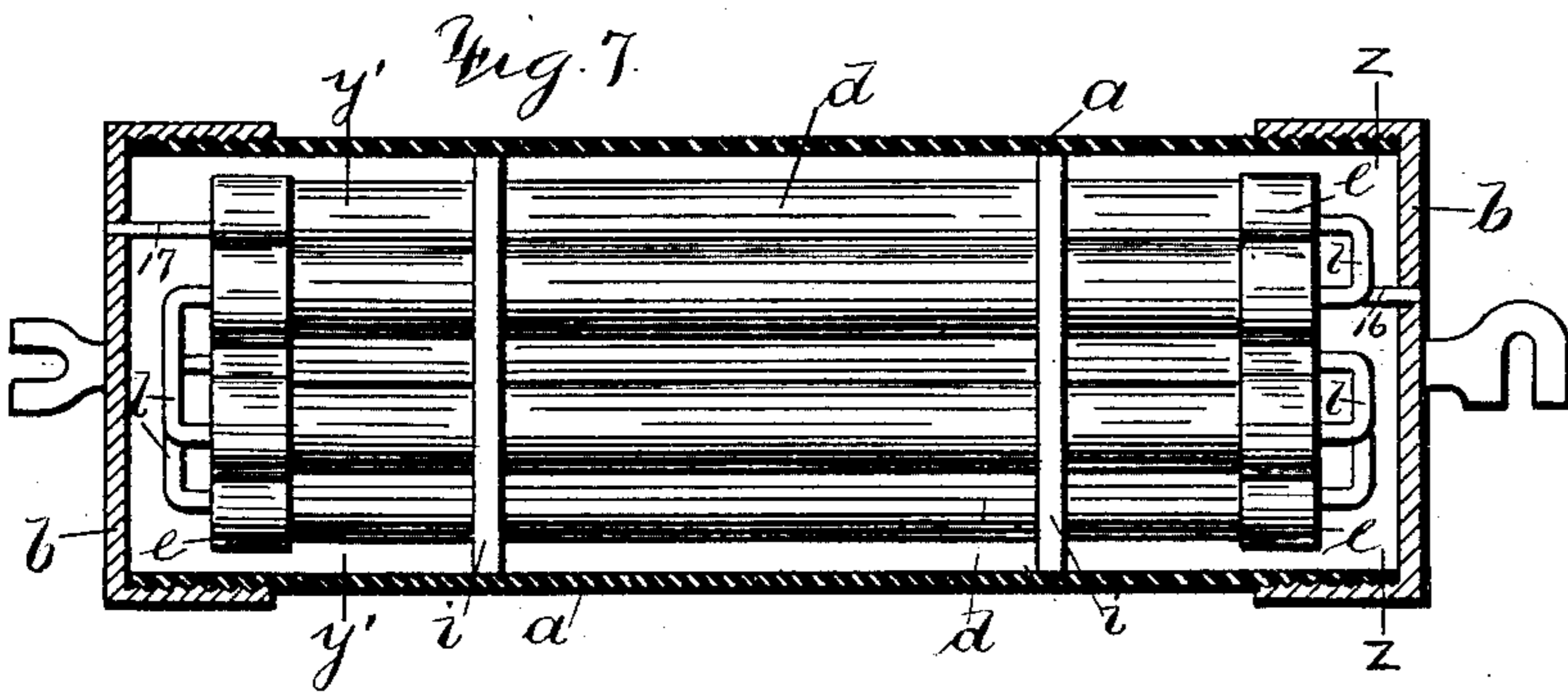
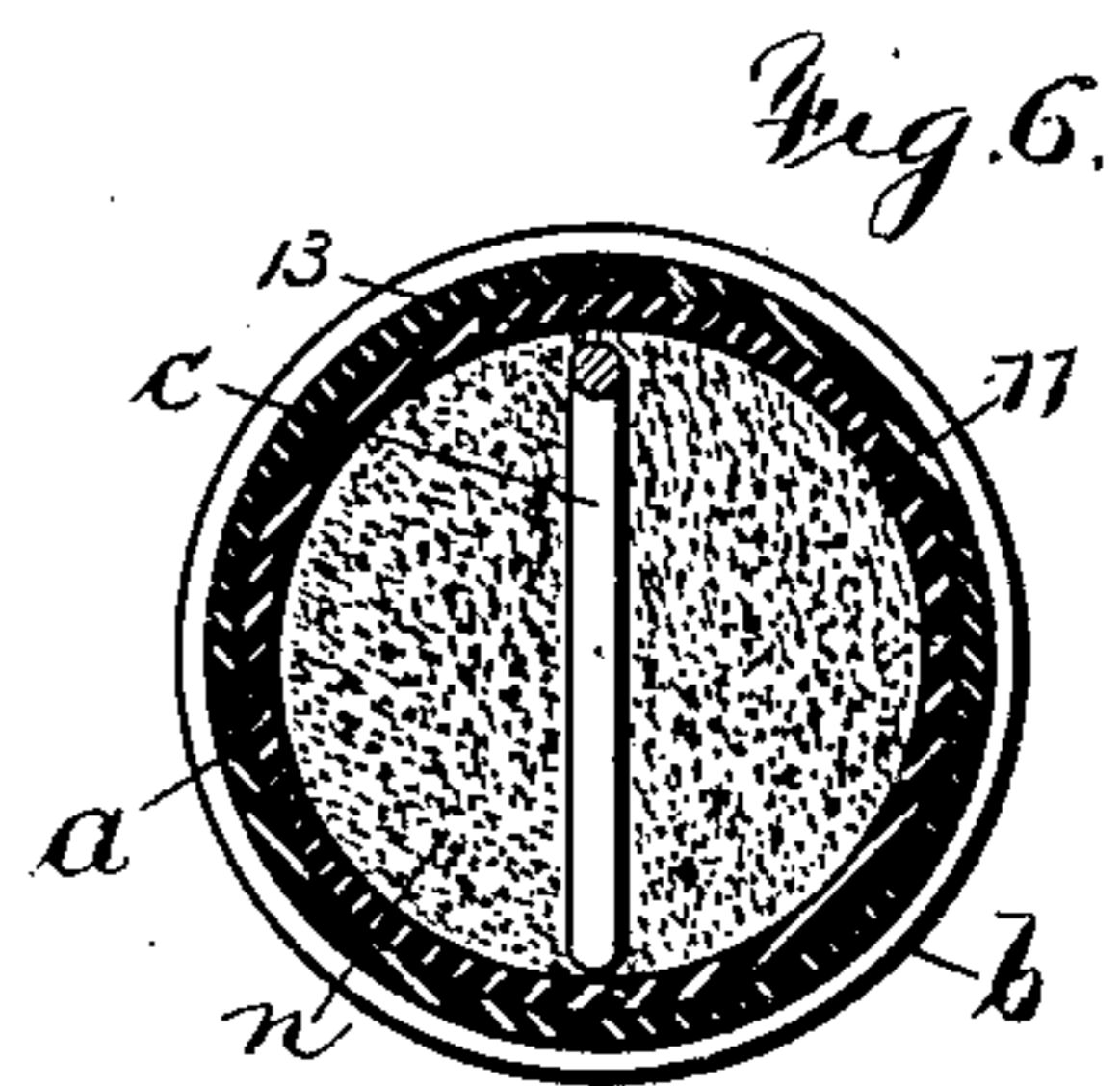
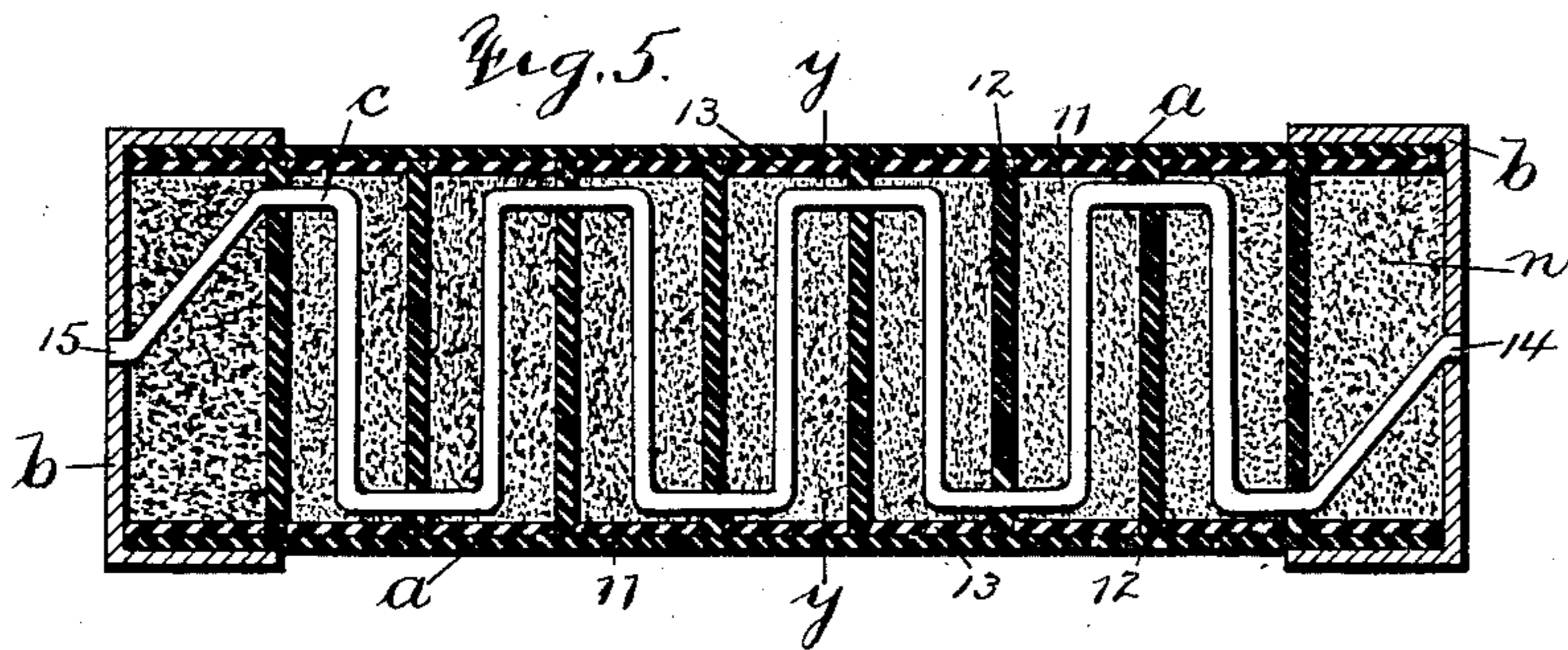
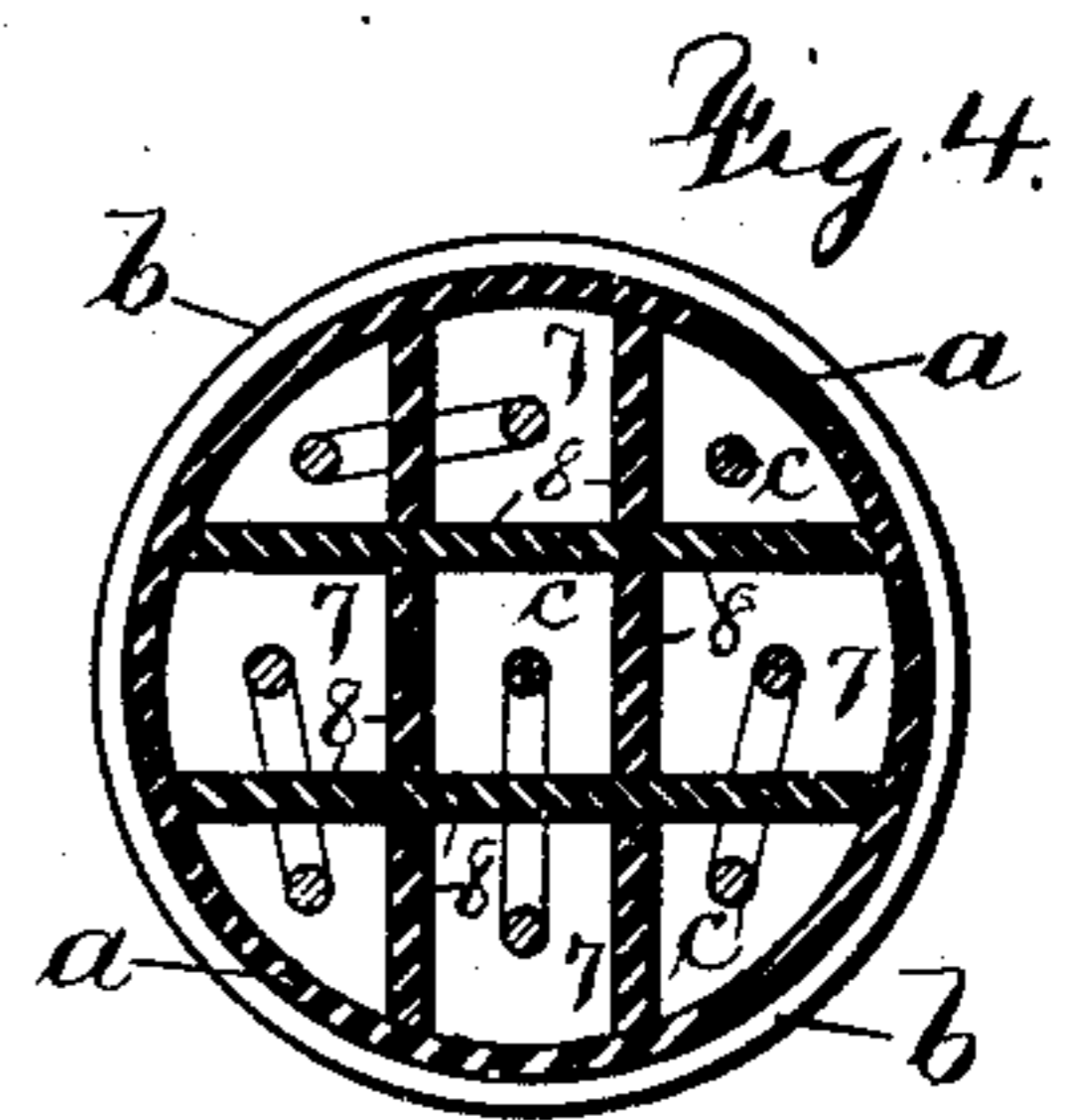
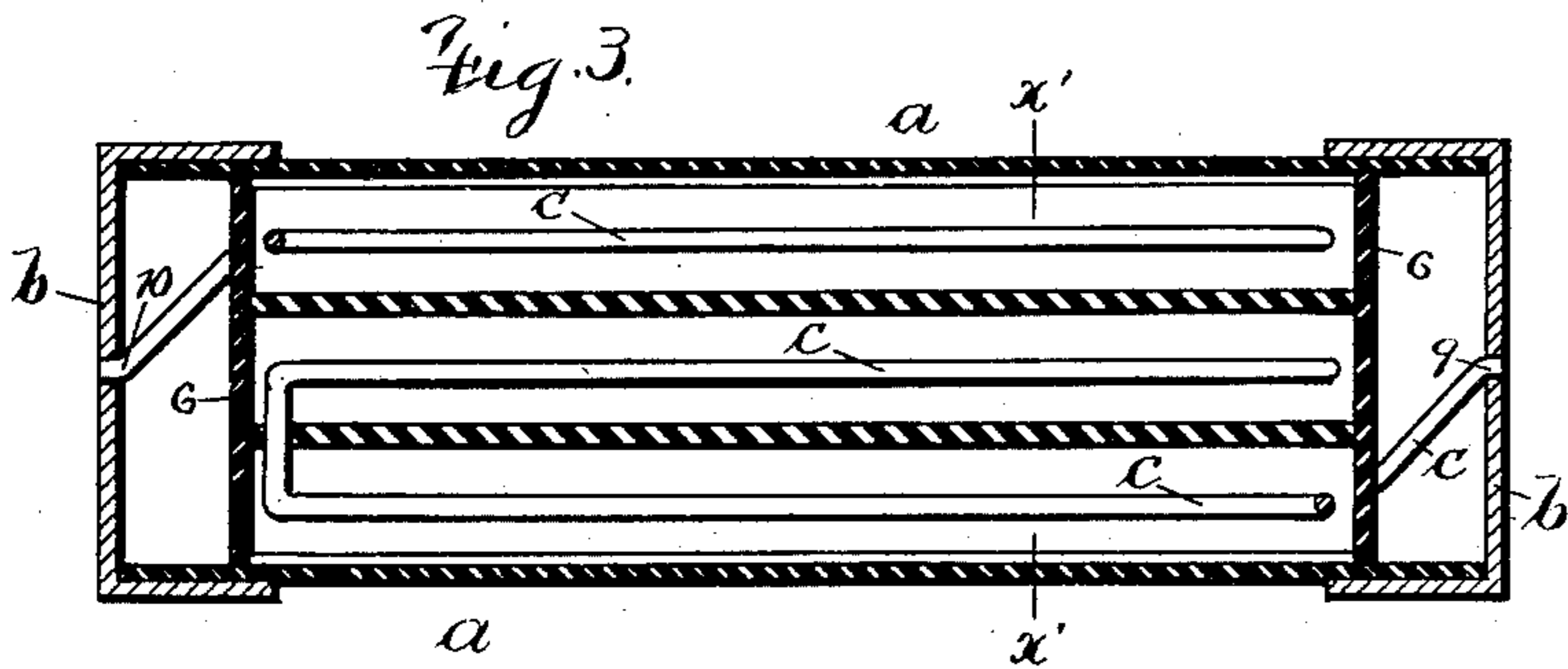
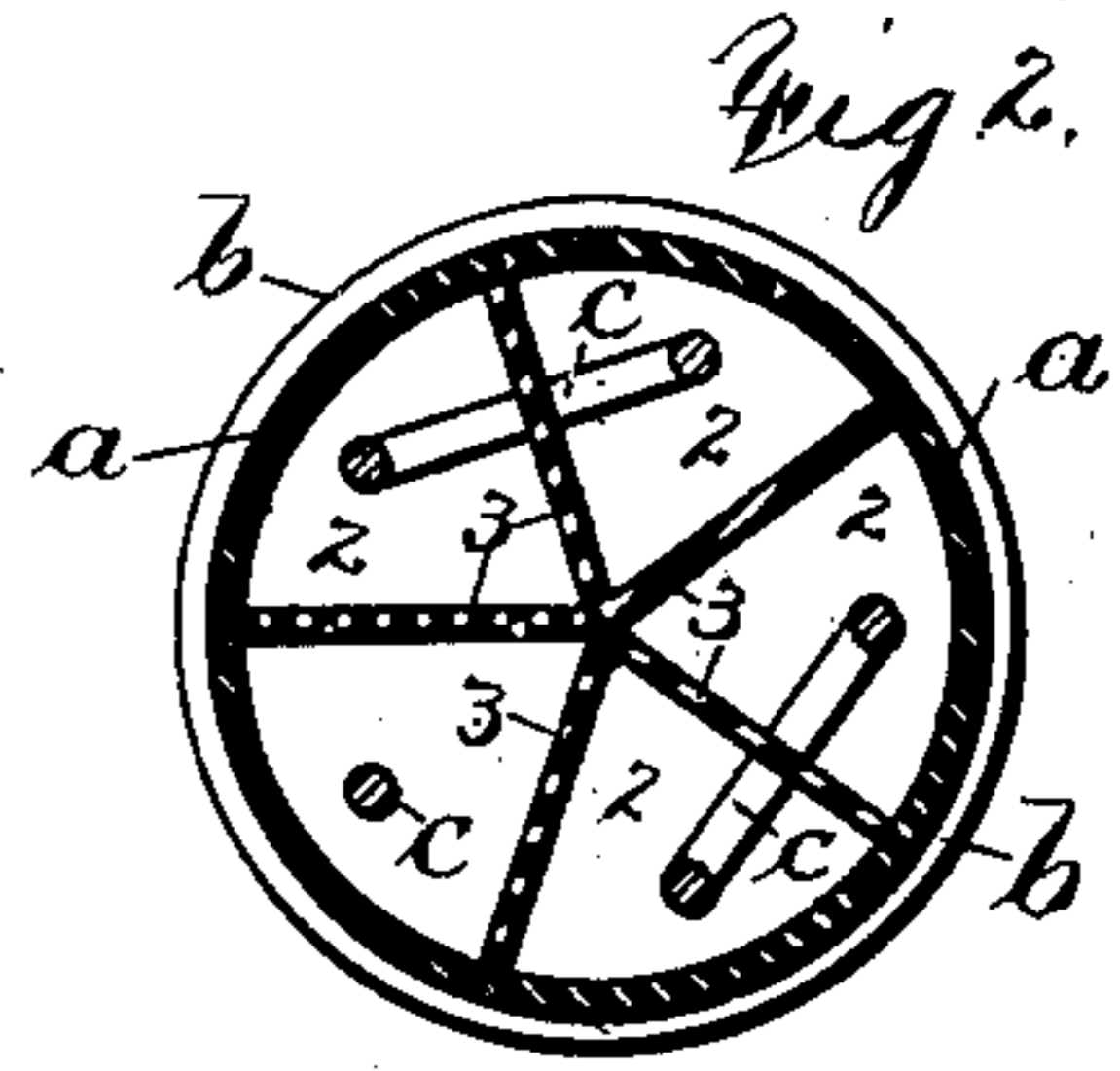
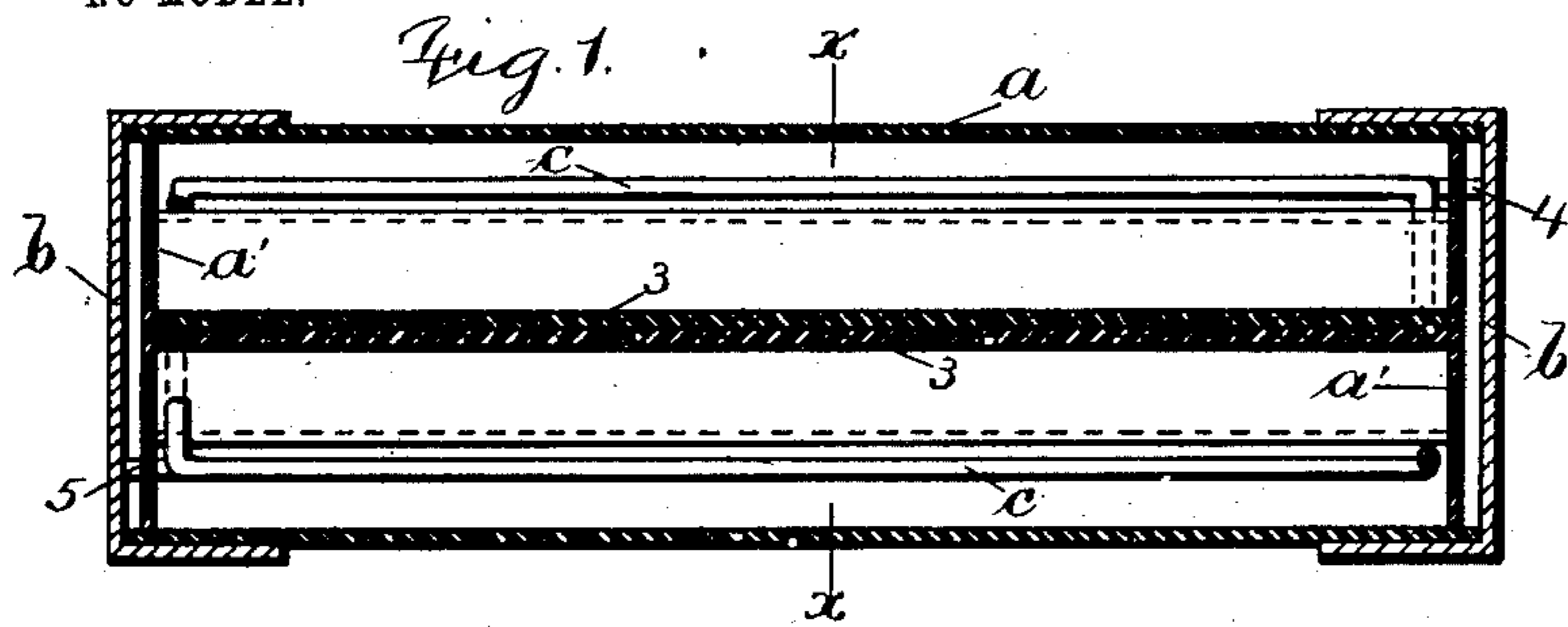


J. SACHS.
SAFETY FUSE.

APPLICATION FILED SEPT. 29, 1902.

NO MODEL.



WITNESSES
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UNITED STATES PATENT OFFICE.

JOSEPH SACHS, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE JOHNS-PRATT COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF CONNECTICUT.

SAFETY-FUSE.

SPECIFICATION forming part of Letters Patent No. 737,284, dated August 25, 1903.

Application filed September 29, 1902. Serial No. 125,170. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH SACHS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented an Improvement in Safety-Fuses, of which the following is a specification.

My invention relates to safety-fuses, and particularly to that type of safety-fuses which is adapted for use on high-tension circuits.

In fuses adapted for use on high-tension circuits it has been necessary to make the fuse-strips abnormally long in order to prevent severe arcing between the terminals when a fuse is blown. Consequently the space occupied by this class of fuses heretofore has been inconveniently long; and the object of my present invention is to produce a high-tension-circuit fuse having a fuse-strip of requisite length and resultant capacity to give sufficient arcing distance when the fuse is blown, and which fuse at the same time shall occupy no more space than a fuse of lower-voltage capacity.

Modifications of my invention also make it applicable to fuses of heavy-current capacity as well as high voltage.

In carrying out my invention I provide a casing or support which is divided longitudinally or transversely into any desired number of sections or compartments within and through each of which a fuse-strip extends. I also provide terminals for the casing or support and electrical connections between the same and one end of the respective fuse-strips in two of the said compartments and electrical connections between the alternate ends of the fuse-strips in adjacent compartments or electrical connections from the said terminals to the respective ends of the fuse-strips. The said compartments may or may not be filled with a loose insulating and heat-dissipating material, and the walls by which the casing is divided into said compartments are preferably made of an insulating material—as, for instance, asbestos paper—which may or may not be either perforated or porous, so that upon the blowing of a fuse the heat and gases generated thereby are uniformly diffused and absorbed entirely within the casing. The filling may be of a nature to combine with

the fuse metal under the heat action of the current or otherwise.

In the drawings, Figure 1 represents a central longitudinal section of a safety-fuse constructed according to my present invention. Fig. 2 is a cross-section at $x x$, Fig. 1. Figs. 3, 5, and 7 are respectively similar views of modifications of the form shown in Fig. 1, Fig. 4 being a cross-section at $x' x'$, Fig. 3. Fig. 6 is a cross-section at $y y$, Fig. 5. Fig. 8 is a cross-section at $y' y'$, Fig. 7, and Fig. 9 is a cross-section at $z z$, Fig. 7. Fig. 10 is a transverse section of a modification of the form shown in Figs. 7, 8, and 9.

a represents a fuse casing or support, made of any good insulating material and preferably cylindrical in shape.

$b b$ represent the terminals for the fuse-casing a , which are secured to the ends thereof in any desired manner. I have shown the terminals b of cap shape; but I do not limit myself to this form, as they may be of any well-known type. In Fig. 1 I have shown the casing divided into longitudinal compartments 2 by the radial division-walls 3, said walls preferably extending between the plugs a' within the casing and adjacent to the inner surfaces of the terminals b .

c represents a strip of fusible metal, one end of which is secured electrically to one of the terminals b at 4 and is then carried along one compartment through the wall and so successively through all the compartments 2, being threaded from one to the next adjacent compartment at the alternate ends thereof and terminating at the other end in an electrical connection with the opposite terminal b at 5.

In Figs. 3 and 4, which are modifications of Figs. 1 and 2, I have shown transverse division-walls 6 adjacent to the terminals b and which partake of the nature of plugs for the casing a . Between the transverse walls 6 the casing a is divided into independent compartments 7 by the longitudinal walls 8 in series at right angles to one another. The fuse-strip c extends through each of the said independent compartments 7 in succession and is connected electrically at its respective ends 9 and 10 to the terminals b .

In Figs. 5 and 6 I have illustrated the cas-

ing *a* as divided into cylindrical compartments 11 by the transverse division-walls 12, which may be made to wedge within the casing *a* or may be held in position, as shown, by means of the hollow cylindrical sections 13, fitting closely within the casing *a*. Here the fuse-strip *c* is also secured electrically at its respective ends 14 15 to the terminals *b b* and passed successively through each compartment 11, being threaded from one to the next adjacent compartment, preferably at diametrically opposite sides thereof.

In Figs. 7, 8, and 9 I have illustrated a modification consisting in the usual casing or support *a* and the terminals *b b*, which in this form are preferably adapted to screw onto the ends of the casing *a*. Within the casing I employ a plurality of inclosed fuses, each having its independent casing *d*, terminals *e*, and fuse-strip *h*. These independent inclosed fuses are secured within the casing *a* in any desired manner. I have shown as a suitable support a split transverse frame *i*, fitting within the casing and through which the independent fuses pass and are secured. Any other devices, however, by means of which the fuses may be easily removed from the casing may be used with equal facility and utility. I have shown the various independent fuses connected in series between the terminals *b* by means of the leads 16 and 17 and connections *l*; but it will be apparent that the fuses may be connected in multiple between the terminals should it be desired to obtain a fuse of large current capacity and corresponding lower voltage, which it is to be understood is equally true in regard to the other forms of my invention, as shown.

When an unusual length or very large carrying capacity of fuse-strip is required, the outer casing or support may be completely filled with the independent fuse-casings *d'* and their respective fuse-strips, as shown in Fig. 10, in which instance the terminals *e* of the independent fuse-casings are necessarily dispensed with, and the ends of the fuse-strips are connected either in series or multiple to the terminals of the outer casing, as hereinbefore described.

The independent compartments may or may not be filled with an insulating and heat-absorbing material *n*—such, for instance, as chalk, asbestos, plaster-of-paris, magnesia, silicic acid, sand, &c. It is also to be understood that I do not limit myself to the precise construction shown in the drawings, as the same may be varied within reasonable limits without departing from the spirit of my invention.

I claim as my invention—

1. An electric safety-fuse comprising a casing, terminals secured to said casing, a plurality of independent longitudinally-disposed compartments within the casing, fuse-strips in the several compartments so connected as to form a substantially integral strip from

end to end of the several compartments and electrical connections between the respective terminals and the fuse-strips.

2. An electric safety-fuse, comprising a casing, terminals secured to the said casing, partitions placed longitudinally of the casing so as to divide the same up into a plurality of independent compartments, fuse-strips in the several compartments connected at their ends so as to substantially constitute a continuous fuse extending back and forth through the several compartments, and electric connections between the respective terminals and the fuse-strips.

3. An electric safety-fuse, comprising a casing, terminals secured to said casing, a plurality of independent longitudinally-disposed compartments within said casing with their respective ends short of the entire length of the casing, and fuse-strips in the several compartments with the respective ends connected so as to substantially form a continuous fuse-strip running through the plurality of independent compartments, and electrical connections between the respective terminals and the fuse-strips.

4. An electric safety-fuse, comprising a casing, terminals secured to said casing, partitions arranged radially within said casing from the common center and running longitudinally of the casing and dividing the same up into a plurality of independent compartments, a fuse-strip in each compartment the ends being connected so as to substantially form a continuous fuse-strip running back and forth through the plurality of independent compartments, and electrical connections between the respective terminals and the fuse-strips.

5. An electric safety-fuse, comprising a casing, terminals secured to said casing, partitions arranged radially within said casing from a common center and running longitudinally of the casing and dividing the same up into a plurality of independent compartments, a continuous fuse-strip extending progressively back and forth through the several compartments and bent around the ends of the partitions separating the respective compartments, and electrical connections between the respective terminals and the fuse-strips.

6. An electrical safety-fuse, comprising a casing and terminals secured to said casing, a plurality of partitions creating cellular compartments within the casing, a fuse-strip in each compartment their ends so connected as to form a substantially integral strip from end to end of the compartments, and electrical connections between the respective terminals and the fuse-strips.

7. An electrical safety-fuse, comprising a casing and terminals secured to said casing, a plurality of partitions creating cellular compartments within the casing, and a fuse-strip connected at one end to one terminal and ex-

tending back and forth through the respective compartments with the opposite end connected to the other terminal.

5 8. An electrical safety-fuse, comprising a casing and terminals secured to said casing, a plurality of partitions creating cellular compartments within the casing, fuse-strips in the several compartments with prolongations passing through the partitions into the next
10 compartments short of the ends of the cellular compartments and so connected as to form

a substantially integral strip from end to end of the compartments, and electrical connections between the respective terminals and the fuse-strips.

Signed by me this 23d day of September, 1902.

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JOSEPH SACHS.

Witnesses:

JAS. C. HOWELL,
CHAS. H. SAGE.