

No. 816,478.

PATENTED MAR. 27, 1906.

H. KIRSCHNING, DEC'D.
E. A. KIRSCHNING, ADMINISTRATRIX.

PACKING RING.

APPLICATION FILED JAN. 17, 1906.

2 SHEETS—SHEET 1.

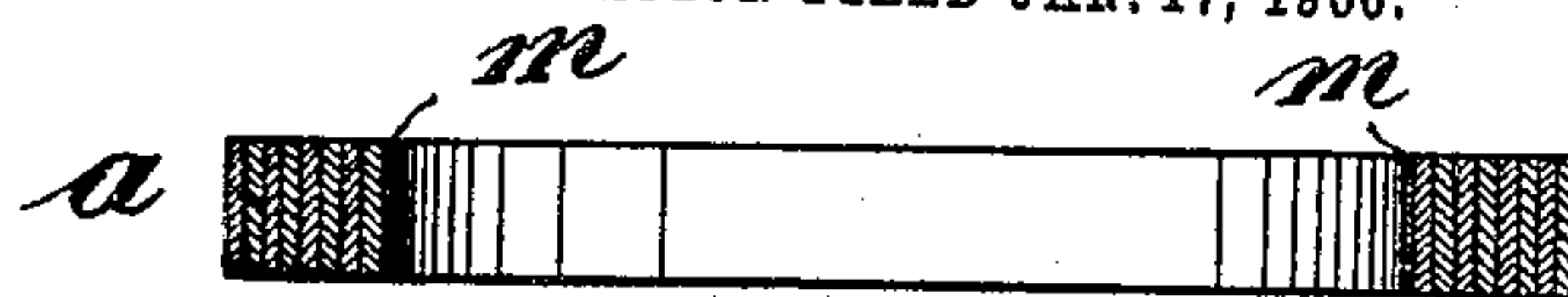


Fig. 1.

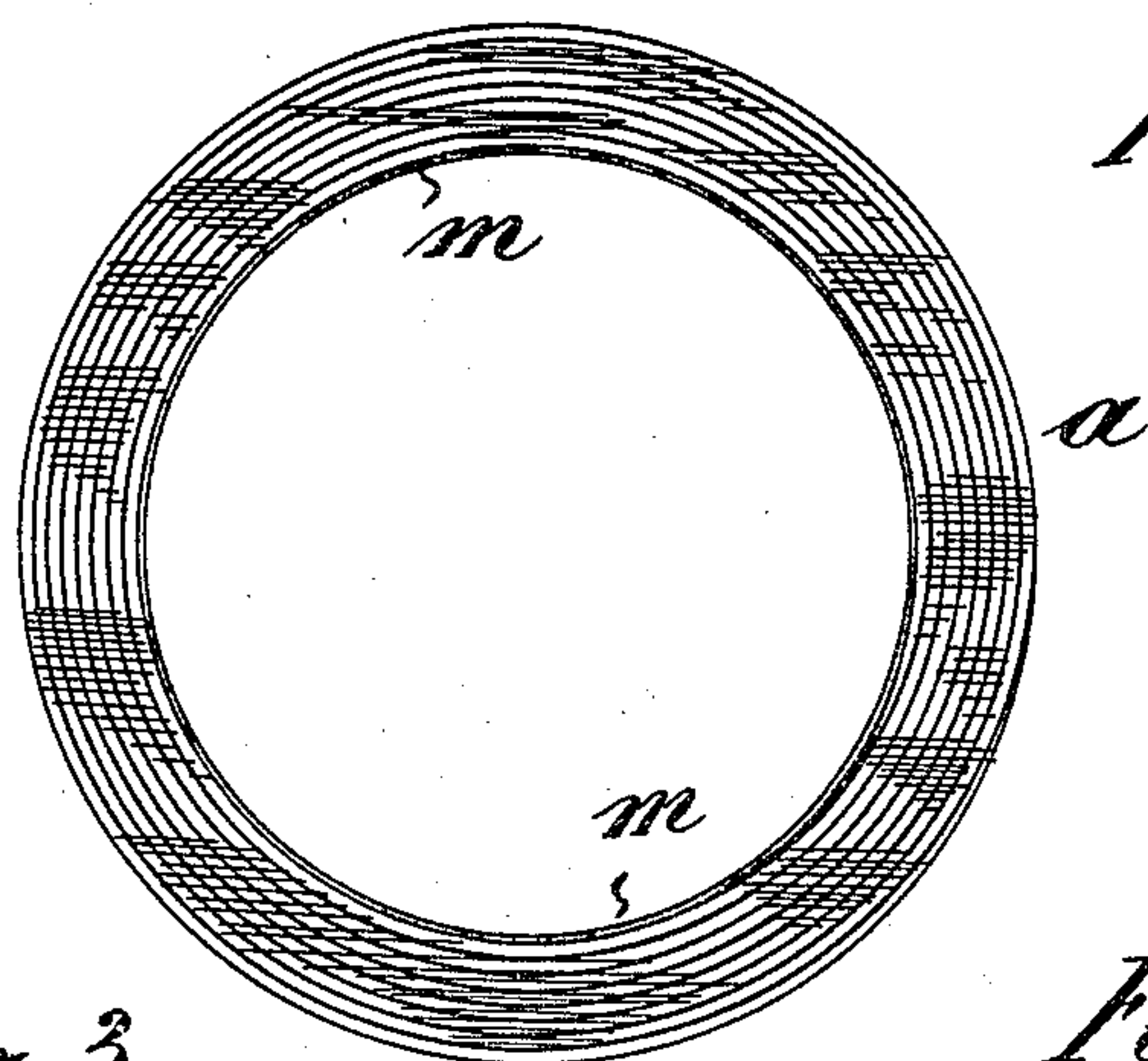


Fig. 2.

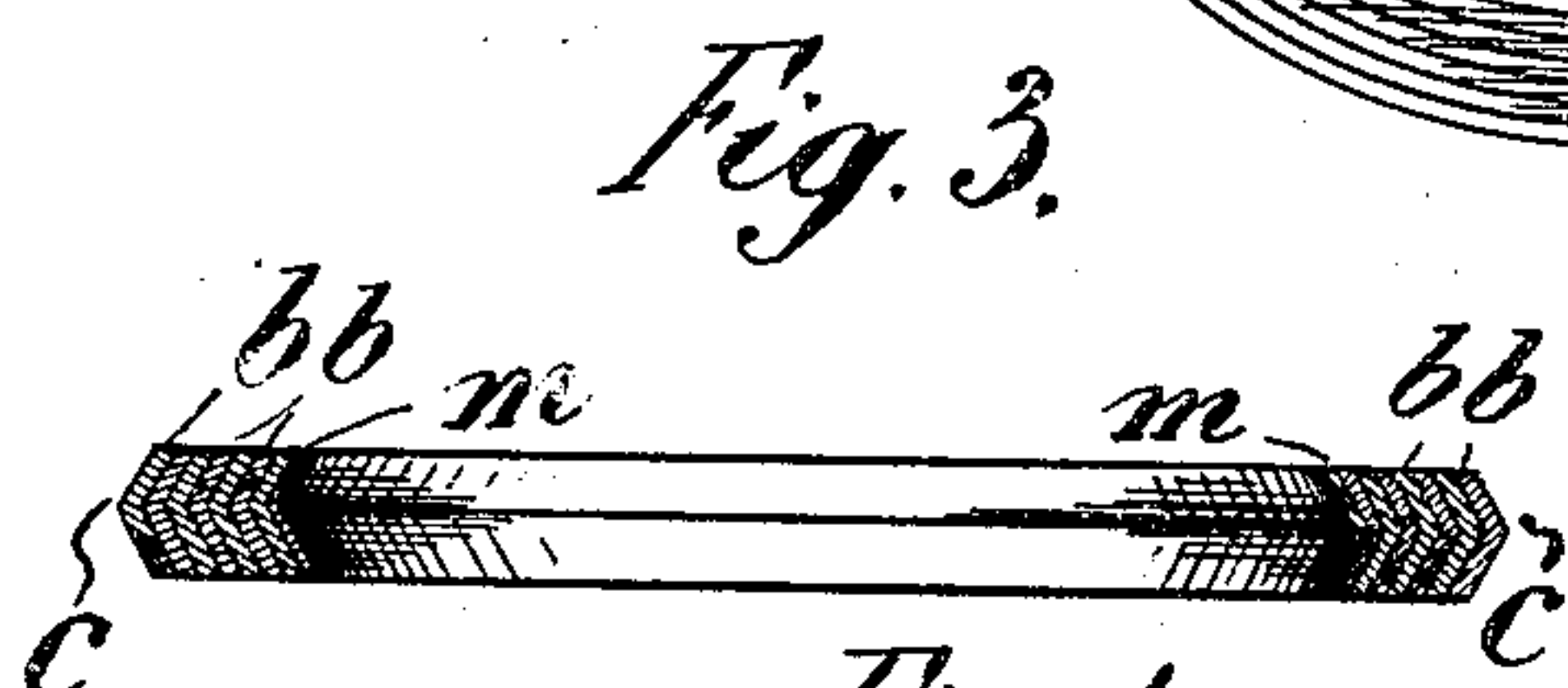


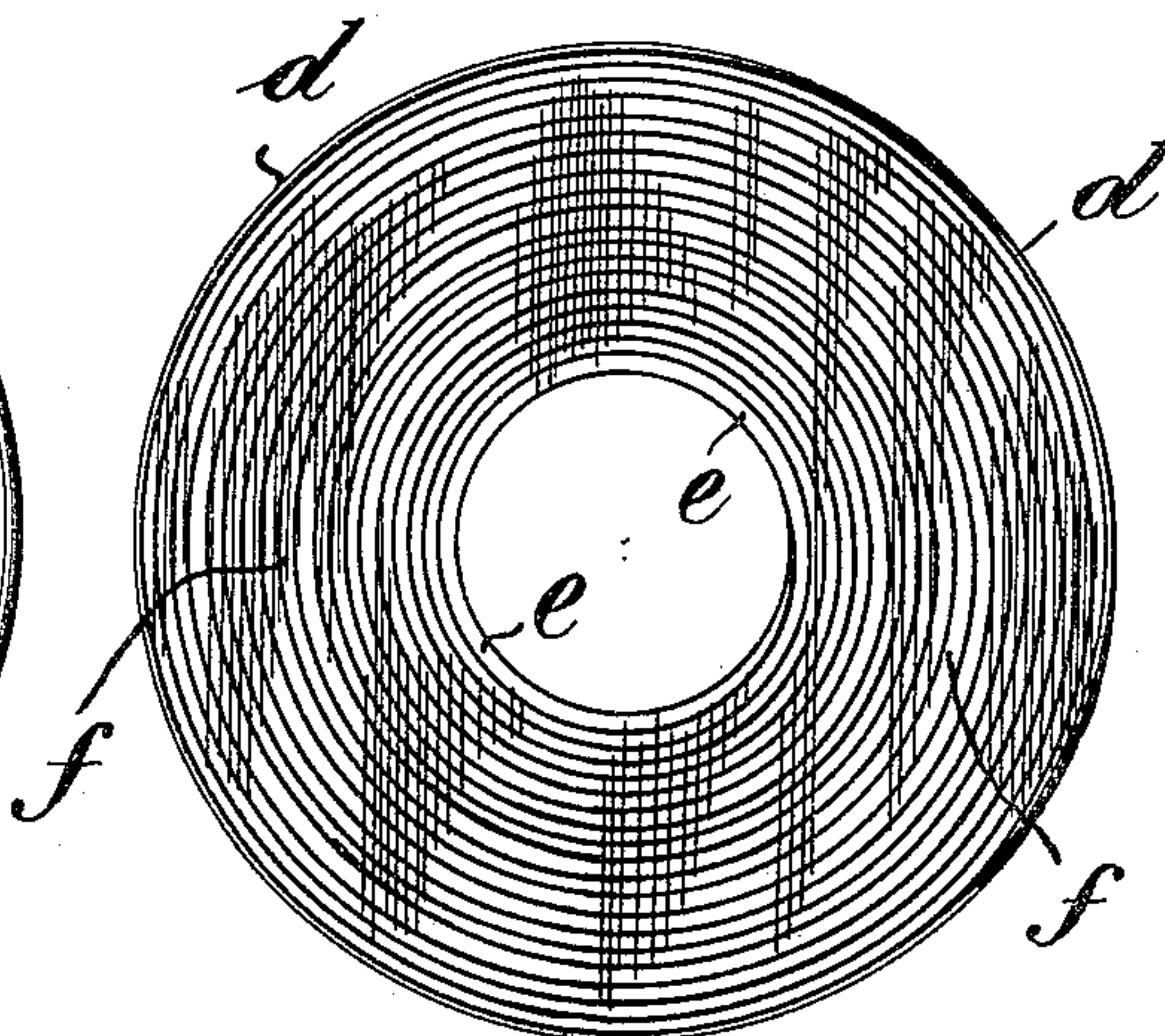
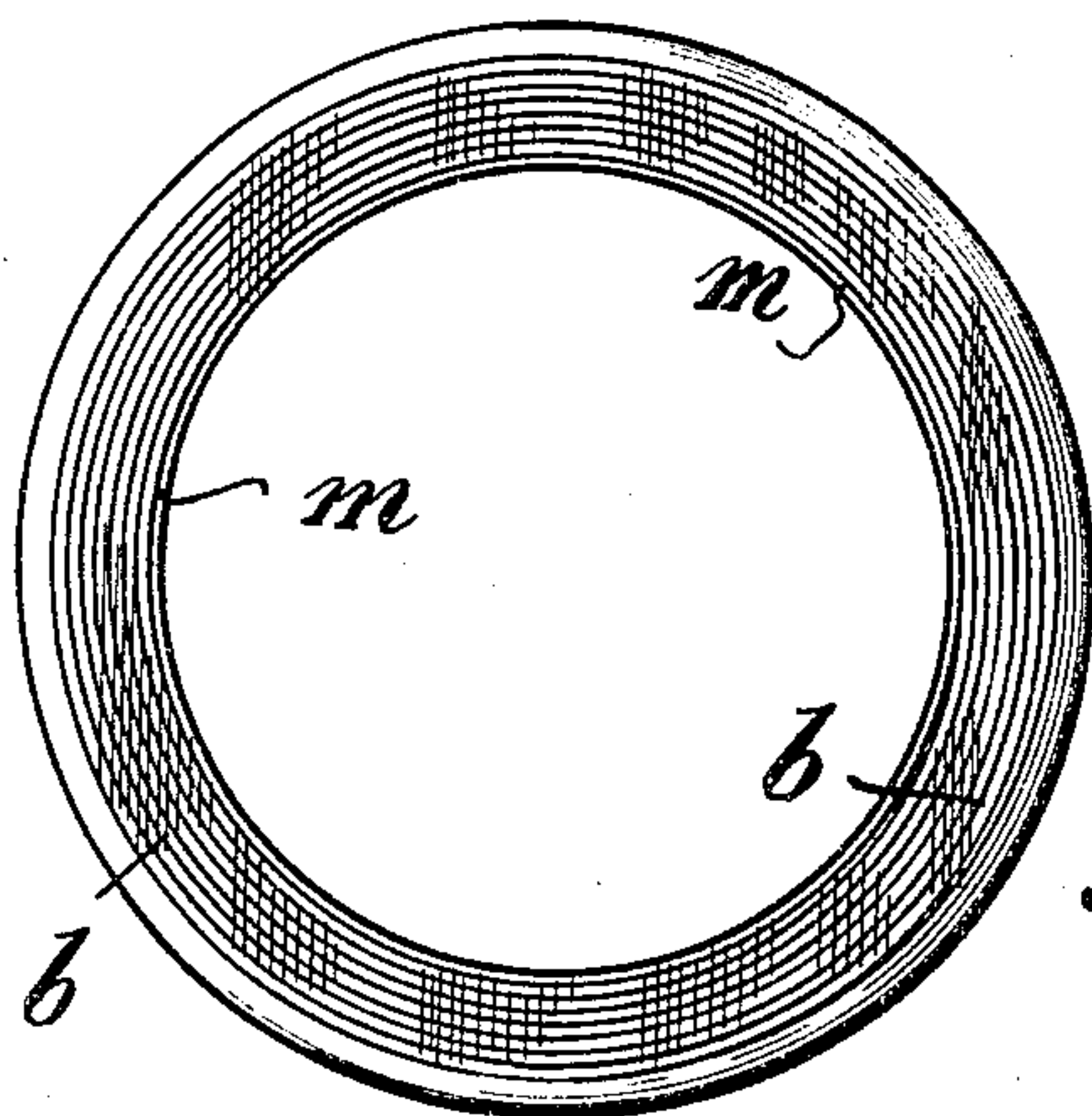
Fig. 3.



Fig. 5.

Fig. 4.

Fig. 6.



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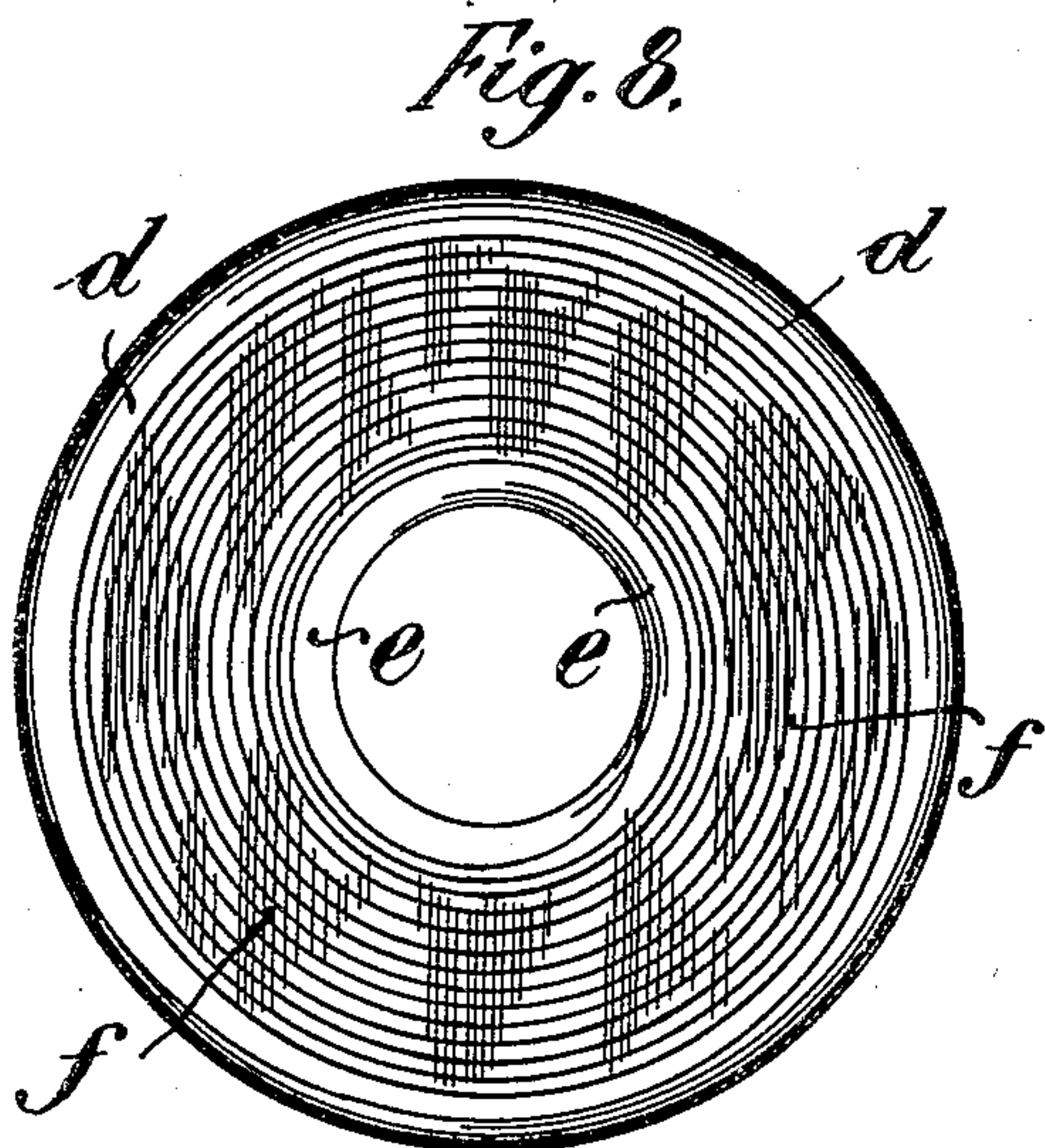
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

EMMA AMALIE KIRSCHNING, OF BERLIN, GERMANY, ADMINISTRATRIX OF
HERMANN KIRSCHNING, DECEASED.

PACKING-RING.

No. 816,478.

Specification of Letters Patent.

Patented March 27, 1906.

Application filed January 17, 1906. Serial No. 296,581.

To all whom it may concern:

Be it known that HERMANN KIRSCHNING, deceased, late a subject of the German Emperor, and a resident of 132 Ackerstrasse, Berlin, Germany, did invent certain new and useful Improvements in Packing-Rings, of which the following is a specification.

This invention relates to improvements in packing-rings produced in the known manner by spirally winding or rolling up strips of flexible material.

The novel feature of the improved packing-rings lies in the fact that adjacent coils or convolutions of the said strips of material are made in the form of troughs, channels, or the like—that is to say, the surface of the strips is protuberant or convex on one side and recessed or concave on the other side, so that the protuberant surface of one coil is adapted to engage the recessed surface of the adjacent coil somewhat in the manner of a so-called “feather” or “spline.” The protuberant and recessed surfaces need not be continuous. If desired, certain portions or sections of each coil may remain substantially cylindrical, but in that case also the arrangement is of course such that the protuberant surface parts of each coil coincide with recessed surface parts of the adjacent coil. By this means the durability of the rings is considerably increased, and the accidental unwinding or lateral spreading thereof, by which they may drop out of the joints to be made tight, is prevented. In the absence of the “spline-and-groove” connections referred to the unwinding or spreading of the bent strips is particularly liable to occur when the ring has become hot and wet. If, for example, an adhesive substance has been used to interconnect the coils of material, the said substance is of course rendered soft by heat and moisture.

For producing a packing-ring according to the present invention a single strip of material can be wound up in the manner indicated, or a plurality of such strips, wound separately or together, can be used. The material of which the strips consist varies, of course, according to the nature of the requirements. Fiber, asbestos, india-rubber, and the like can, for example, be used, and, if desired, strips of various materials can be made to alternate with each other in the construction of a single ring. Thus, for instance,

strips of strong fibrous material can be used alternately with strips of softer material, such as woven fabric or asbestos, and the rings can be strengthened by means of rims, stays, trusses, or the like, of metal or other substantially rigid material.

The term “packing-ring” used in connection with the present invention includes, of course, annular, elliptical, and polygonal packings.

The invention will be fully understood upon reference to the accompanying drawings, in which—

Figures 1 and 2 are respectively a cross-section and a plan of the unfinished packing-ring. Figs. 3 and 4 are respectively a cross-section and a plan of a finished packing-ring. Figs. 5 and 6, respectively, and Figs. 7 and 8 are respectively cross-sections and plans of otherwise bended packing-rings.

In the first place a strip or strips of flat flexible material or materials are wound up to a ring *a*, as shown in Figs. 1 and 2, cement or the like being, if desired, used to wind together the coils of which the ring is formed. Thereupon the ring *a* is bent down by means of a press, proceeding in such a manner that the adjacent coils form connections analogous to those produced by means of grooves and splines.

In the form of construction shown in Figs. 3 and 4 the strip of material forming the coils *b* is bent in such a manner that in cross-section each part of the strip is V-shaped, with the apex *c* of the “V” directed toward the outer circumference of the ring.

Figs. 5 and 6 illustrate a form of construction in which the outer coils *d* are outwardly bent, the inner coils *e* being inwardly bent. The outermost and innermost coils are bent at more acute angles than the coils between them, the acuteness of the said angles decreasing as the central coil *f* of the layer is approached. The said coil *f* is not angularly bent at all; but both its inner and its outer surface are slightly angular in order to fit against the respective adjacent coil-surfaces. The bending of the strips in the manner shown in Figs. 3 and 5 can either be effected between suitably-shaped wheels or cylinders acting in lateral direction or by means of lateral pressure exerted on the wound strip with the aid of a suitably-shaped tool.

The packing-ring shown in Figs. 3 and 4

comprises an internal ring or layer *m* of metal or the like. If desired, a similar ring or layer can be placed round the external circumference of the outermost coil *b*. Metallic strips
5 can of course also be inserted between the strips or coils forming the packing-ring.

In the form of construction shown in Figs. 7 and 8 the strips of material of which the packing-ring is formed are not so sharply
10 bent as in the ring shown in Fig. 5; but the degree of convexity and concavity of the outer and inner coils *d* and *e* also decreases as the central coil *f* is approached, the latter having two convex surfaces. This forma-
15 tion of the ring is preferably produced by means of powerful axial pressure after the flat strips have been wound, the said pressure being, for example, exerted by means of a press.

20 The longitudinal bending, channeling, or grooving of the strips by means of axial pressure exerted on the wound ring produces very intimate interconnection of the coils and great strength is imparted to the ring,
25 more particularly if the arrangement is so made that the fiber, "grain," or the like of the material "runs" in the longitudinal direction of the strips, so that the greatest possible amount of tensile strength is opposed to
30 steam-pressure or the like to which the ring is subjected. The passage of steam or other fluid between the coils is effectually prevented by the improved arrangement even in the case of large rings such as those placed around

manhole-doors and the like. If desired, the
35 strips of material can be suitably impregnated before being wound, or the rings can be sheathed in a suitable manner after the strips have been wound. Neither of these operations is novel in connection with packing-
40 rings.

What is claimed as the invention, and desired to be secured by Letters Patent of the United States, is—

1. A packing-ring consisting of spirally-
45 wound strips of flexible material; each winding of the strips being provided with projections engaging with corresponding recesses in the adjacent winding.

2. A packing-ring consisting of spirally-
50 wound strips of flexible material; each winding of the strips being provided with a longitudinal projection extending throughout the winding and engaging with a corresponding
55 longitudinal recess in the adjacent winding.

3. A packing-ring consisting of spirally-
wound strips; each winding of the strips being concave-convex and the concave portion of each winding engaging with the convex
60 portion of the adjacent winding.

The foregoing specification signed at Berlin this 15th day of December, 1905.

EMMA AMALIE KIRSCHNING,
Administratrix of the estate of Hermann Kirschning, deceased.

In presence of—

WOLDEMAR HAUPT,
HENRY HASPER.