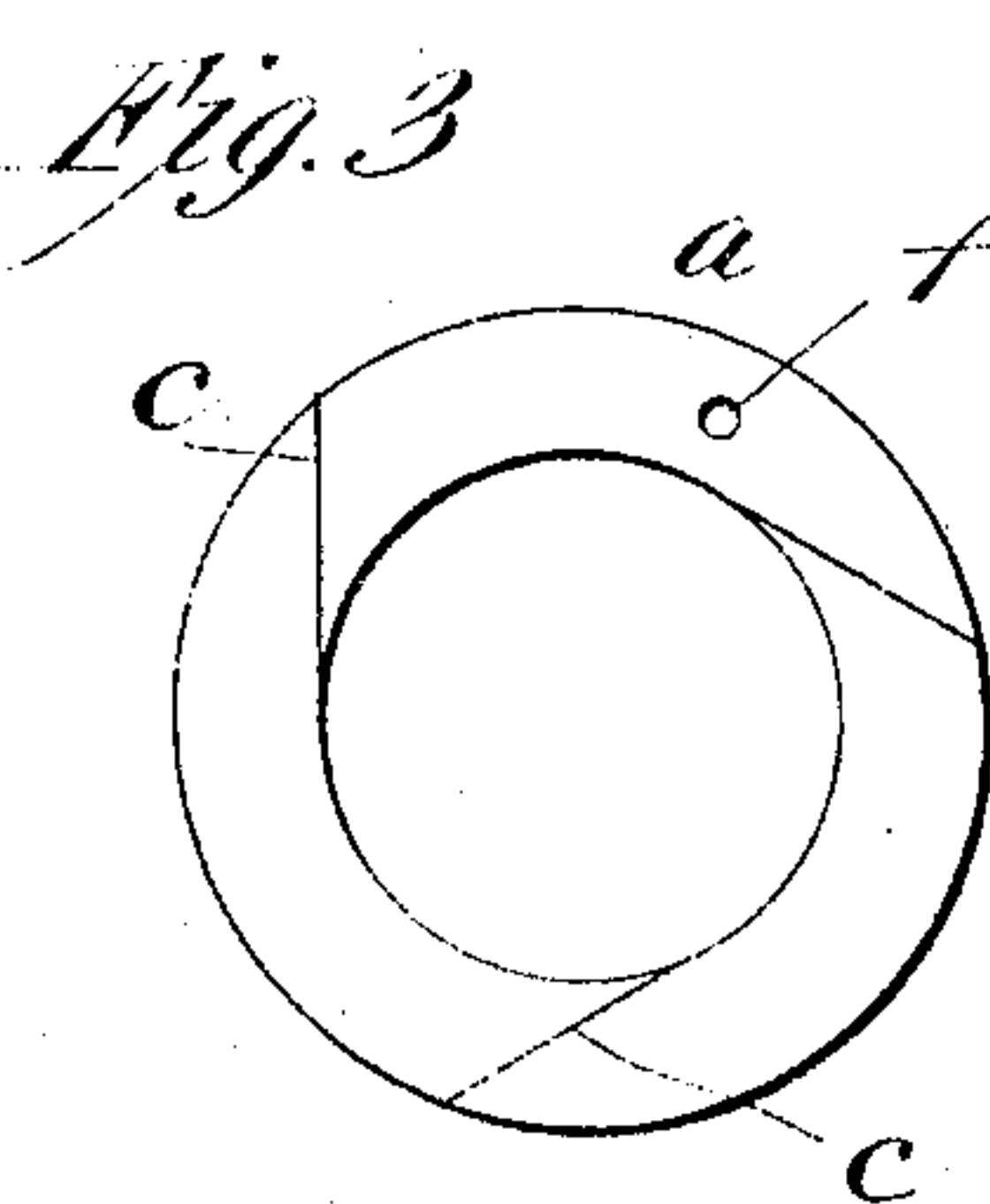
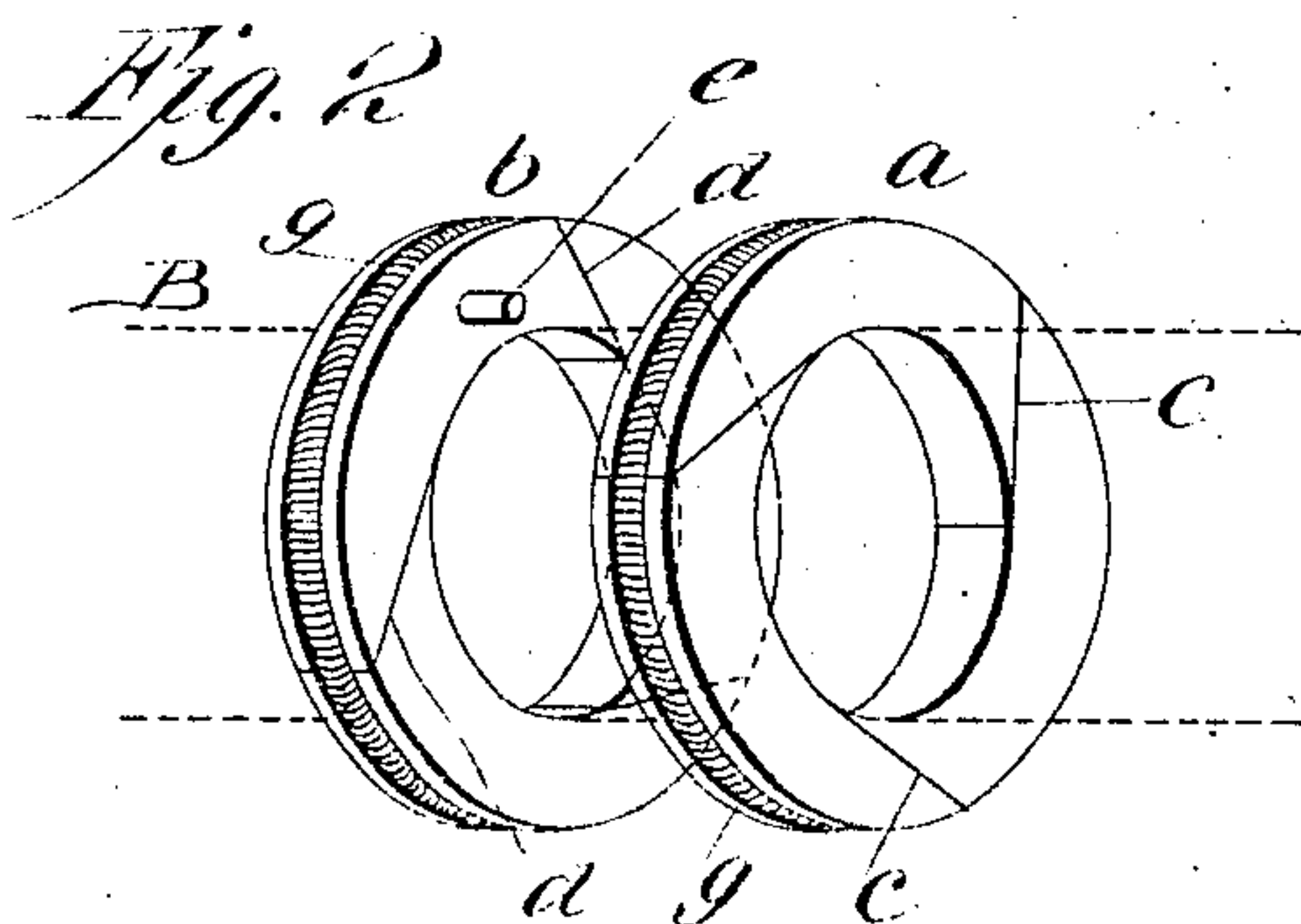
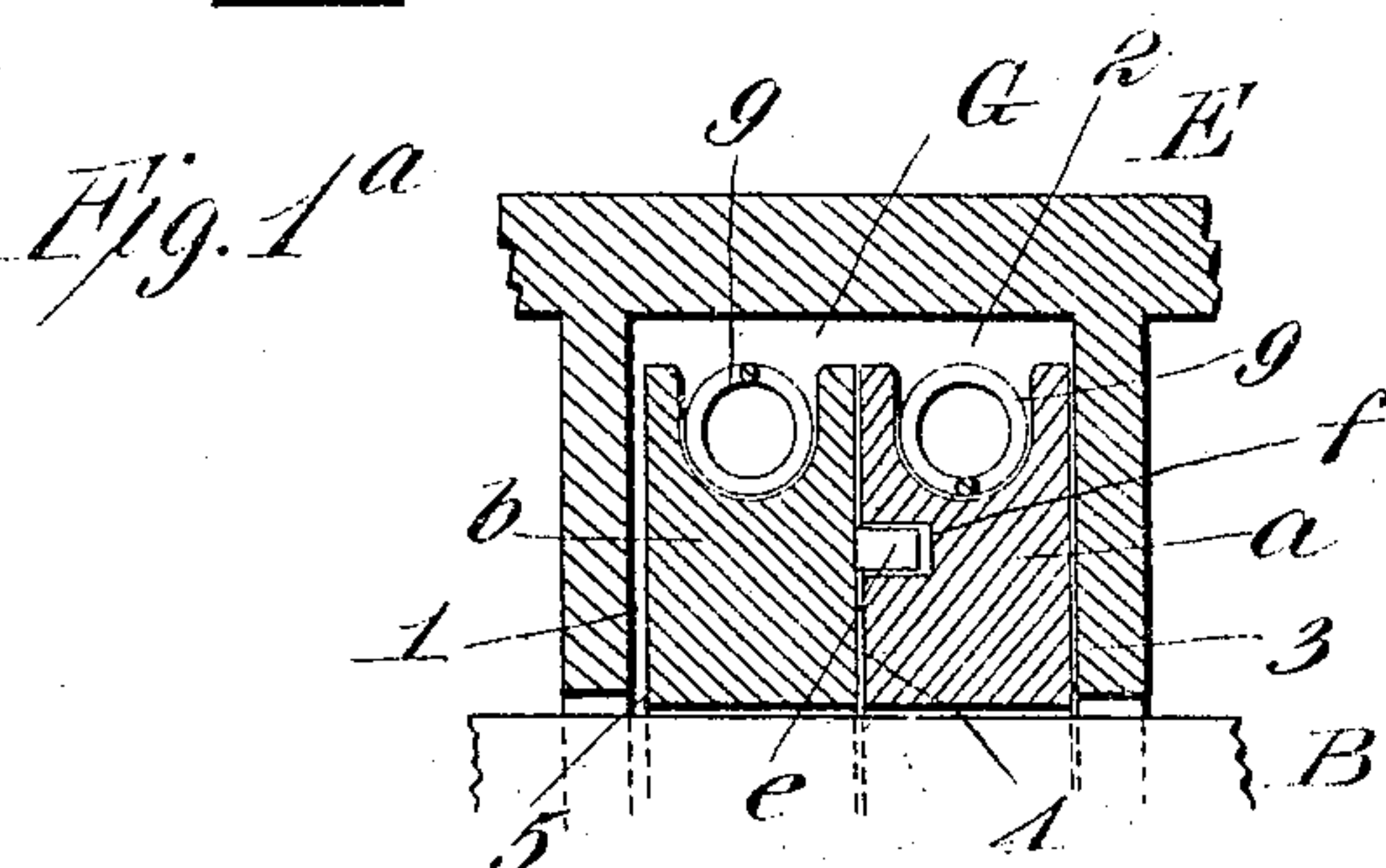
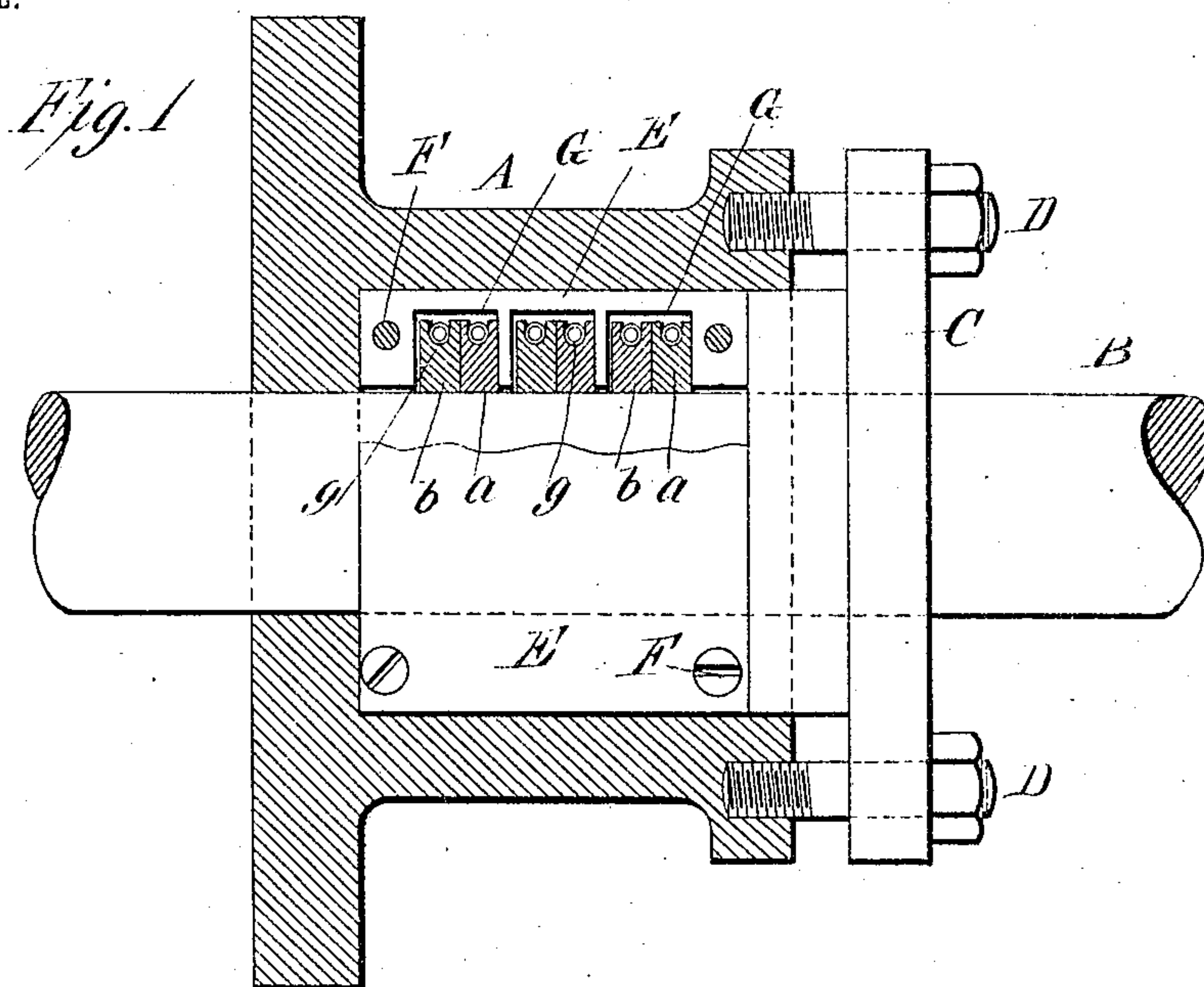


No. 774,490.

PATENTED NOV. 8, 1904.

J. C. PAINE.
METALLIC RING PACKING.
APPLICATION FILED DEC. 18, 1903.

NO MODEL.



Witnesses:

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UNITED STATES PATENT OFFICE.

JEDEDIAH C. PAINE, OF WILKESBARRE, PENNSYLVANIA.

METALLIC RING-PACKING.

SPECIFICATION forming part of Letters Patent No. 774,490, dated November 8, 1904.

Application filed December 18, 1903. Serial No. 185,656. (No model.)

To all whom it may concern:

Be it known that I, JEDEDIAH C. PAINE, a citizen of the United States, residing in the city of Wilkesbarre, county of Luzerne, State of Pennsylvania, have invented a certain new and useful Improvement in Metallic Ring-Packing, of which the following is a description.

The present invention relates to improvements in metallic packing-rings for piston-rods and valve-stems used in connection with steam, air, or gas engines or other machinery.

The invention relates generally to that type of metallic ring-packing in which a metal casing made in two parts and having one or more annular cavities therein contains in it a plurality of sectional rings made of metal. The grooves are sufficiently deep so as to allow sufficient lateral movement of the rings to compensate for irregularities in the piston-rod or side play of the rod and at the same time make a steam-tight joint. So far as I am aware the prior art discloses the use of such rings combined in pairs, the one toward the pressure side being divided radially, while the other, which makes the steam-tight joint with the shaft and casing, is tangentially divided, so as to form a steam-tight joint irrespective of the amount of wear upon the inner surface of the ring. The tangentially-cut ring heretofore has been forced into close engagement with the rod by the pressure of the steam acting upon its periphery, the said steam entering at high pressure that portion of the annular cavity that is outside of the ring and passing thereto through the separating intervals between the radial sections of the separating-ring that is toward the pressure side of the packing. I have discovered after an extensive experience that this arrangement of these rings produces objectionable results and is wrong in principle. It causes the tangentially-cut ring to wear away far more rapidly than its radially-cut companion ring, and the increased friction caused by the introduction of the chamber-pressure of the steam upon the periphery of the tangentially-cut ring causes the rod to wear away far more rapidly than is necessary. The usual arrangement of a tangentially-cut ring with a sup-

porting radially-cut ring is open to the further objection that if by inadvertence the relative position of the rings should be reversed the packing will be imperfect and leakage will result.

I find that it is unnecessary to secure the pressure of steam upon the periphery of the tangentially-cut ring, but that sufficient pressure can be secured by the usual encircling spring.

The present invention comprises a tangentially-cut ring which is substituted for the radially-cut supporting-ring as previously used and which is so located in relation to the other tangentially-cut ring that the joints between the two will be broken. These rings are arranged within a two-part casing having grooves, two rings being placed within each groove. Each of the grooves is but very slightly wider than the thickness of the pair of rings, but is sufficiently deep to permit lateral movement of the rings, so as to compensate for irregularities in the piston-rod and side play of the rod. The constituent parts of the ring are held in engagement with the rod solely by their encircling springs. The rings are maintained in proper relative position so that they break joint by means of any suitable device; but I prefer to use a pin upon one ring engaging with the opening in the other. Both rings being tangentially cut, each will form a steam-tight joint with the rod and each will be of continuous surface, so that the steam at chamber-pressure will not pass into the annular cavity and act upon the periphery of the second ring, as has heretofore been the case. With my invention the steam at chamber-pressure forces one ring against the other and that against the side of the annular cavity, thus making a steam-tight joint with the cavity and with the rod. Both rings being identical, it is immaterial which is toward the chamber.

In order to better understand the nature of the invention, attention is directed to the accompanying drawings, which illustrate one embodiment of the invention, and in which—

Figure 1 shows a sectional view of the stuffing-box with the casing therein partly in section. Fig. 1^a is an enlarged sectional view of

a portion of the packing-rings, rod, and casing. Fig. 2 is a perspective view of the two rings separated, but showing their relative positions as to the location of the tangential joints; and Fig. 3 is a reverse view of one of the rings, showing the opening or mortise within which the pin or dowel of the other ring engages.

In all of the several views like parts are designated by the same letters and figures of reference.

The invention is intended to be applied to metallic packing located within the stuffing-box A, which is of the usual type and surrounds the rod B and is provided with a head or gland C, secured in position by several bolts and nuts D. Within the stuffing-box and surrounding the rod is a two-part casing E, the parts being secured together by screws F. The casing is divided into a plurality of annular cavities G in the form of internal grooves.

The above-described arrangement of stuffing-box and casing is old and well known in the art and when not in combination with the parts to be disclosed forms no part of the present invention.

The rings *a* and *b* are identical and are formed each of a plurality of pieces, (three being illustrated,) the entire ring being in the form of a disk with a center opening and divided into sections by means of straight tangential cuts, so that the abutting faces will be parallel. The two rings are so secured within the annular cavities G that the joints *c* and *d* will break, whereby steam will not leak through the joints of the two rings. The rings are maintained in this mutual relation by any suitable means, that illustrated consisting of a pin or dowel *e* upon one ring engaging with the opening or mortise *f* of the other. The sections of each ring are secured in position around the rod by the usual spring *g* or by other suitable means.

The position of the rings in relation to the annular cavity is illustrated in Fig. 1^a, in which the face 5 of the ring *b* is open to pressure from the steam-chamber. The pressure of steam upon the face 5 forces the ring *b* into engagement with the ring *a* and engages the latter in turn against the wall 3 of the cavity G. The chamber-pressure upon the ring is sufficient to prevent leakage from the cavity G by the ring *a* and wall 3. Neither will there be leakage through the space 4, which separates the two rings, as the rings will be in close engagement. The space 1, separating the ring *b* from the wall of the cavity G, is so small that an inappreciable amount of steam will escape to bear upon the periphery of the ring *a*. For this reason the ring will not be forced against the rod by the pressure of the steam, as has heretofore been the case; but the ring will be held there solely by the action of the spring *g*. In the struc-

ture heretofore in use, in which the ring corresponding to the ring *b* is divided radially, the space separating the sections is sufficiently large to allow the steam at chamber-pressure to enter the cavity G and bear against the periphery of the ring *a*, forcing it with a disproportionate pressure against the rod, causing excessive friction and undue wear upon both rod and ring. I have found in practice that both rings *a* and *b* wear equally and that such wear is inappreciable when compared to that of the tangentially-cut ring when combined with the radially-cut ring, as has hitherto been the practice.

Sufficient space within the chamber G is left to allow lateral movement of the rings to compensate for irregularities in the piston-rod and side play of the latter, so that the rings will have sufficient play within the grooves for this purpose. It is to be noted that the rings are engaged against the wall 3 solely by the steam-pressure and not by a gland or head and are held in engagement solely by their encircling springs and are free to move laterally to compensate for irregularities in the piston-rod and side play of the latter.

My invention may be applied to the packing of piston or valve rods in steam, air, gas, or other forms of engines and to the rods in air or gas compressors, as will be well understood by those skilled in the art.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with a rod and an annular grooved casing, of a pair of sectional rings surrounding the rod and arranged within a groove, the said rings being divided solely on tangential lines, and so mutually arranged as to break joint, the said rings having allowances for play within the groove, substantially as described.

2. In combination with a rod and an annular grooved casing, of a pair of sectional rings surrounding the rod, and arranged within a groove, the said rings being divided solely on tangential lines, and so mutually arranged as to break joint, the said rings having allowances for play within the grooves, each of said rings having an encircling spring, which serves as the sole means of maintaining contact of the ring with the rod, substantially as described.

3. In a ring-packing, the combination with an annular grooved casing and a rod, of a plurality of sectional rings surrounding the rod, the said rings being arranged in a plurality of pairs, each pair within a groove, the said rings having allowances for play within the groove, and being divided solely on tangential lines, and so mutually arranged as to break joint, substantially as described.

4. In a ring-packing, the combination with an annular grooved casing and a rod, of a plu-

5 rality of sectional rings surrounding the rod, the said rings being arranged in a plurality of pairs, each pair within a groove, the said rings having allowances for play within the groove, and being divided solely on tangential lines, and so mutually arranged as to break joint, each of said rings having an encircling spring, which serves as the sole means

of maintaining contact of the ring with the rod, substantially as described.

This specification signed and witnessed this 15th day of December, 1903.

JEDEDIAH C. PAINE.

Witnesses:

JNO. ROBT. TAYLOR,
JOHN L. LOTSCH.