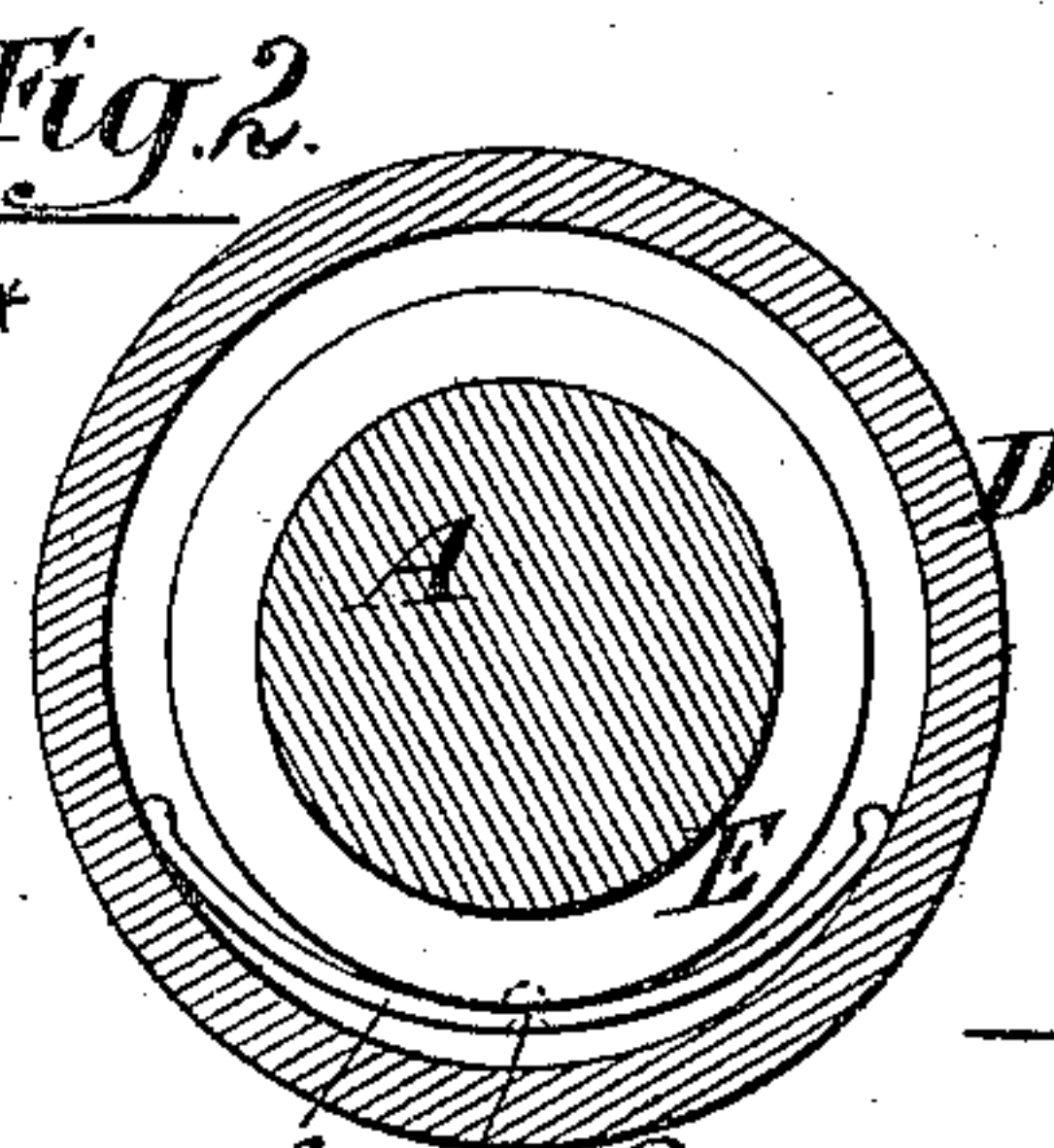
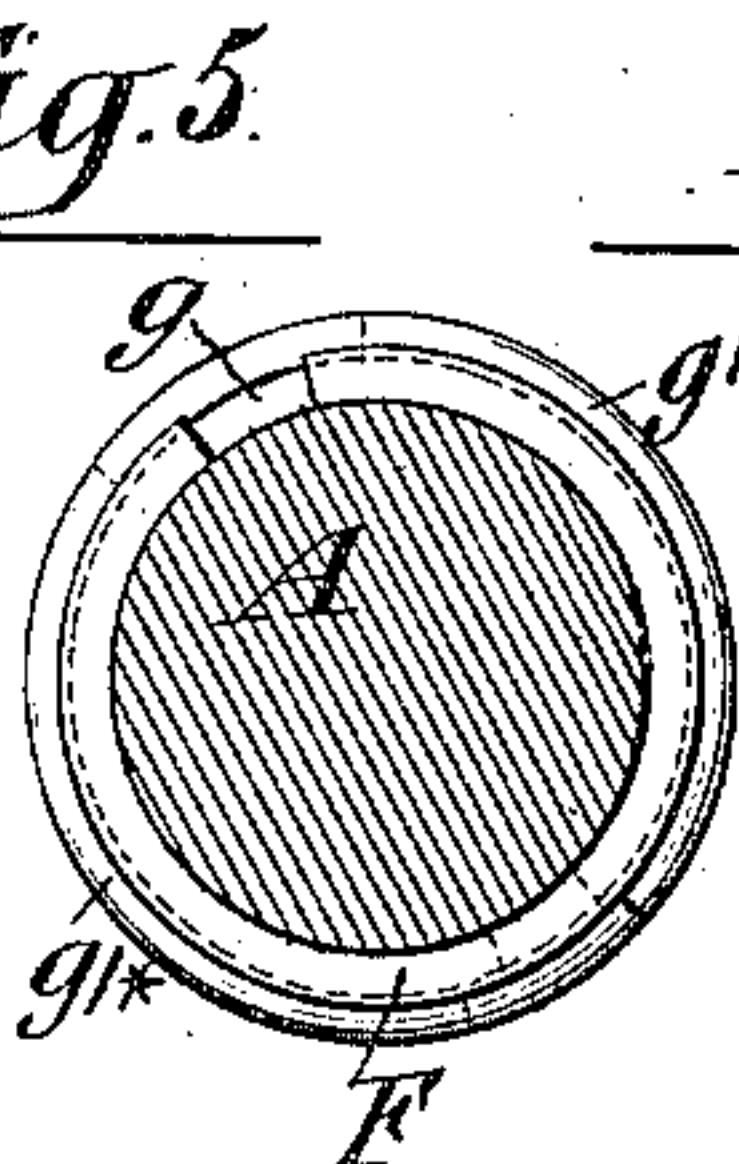
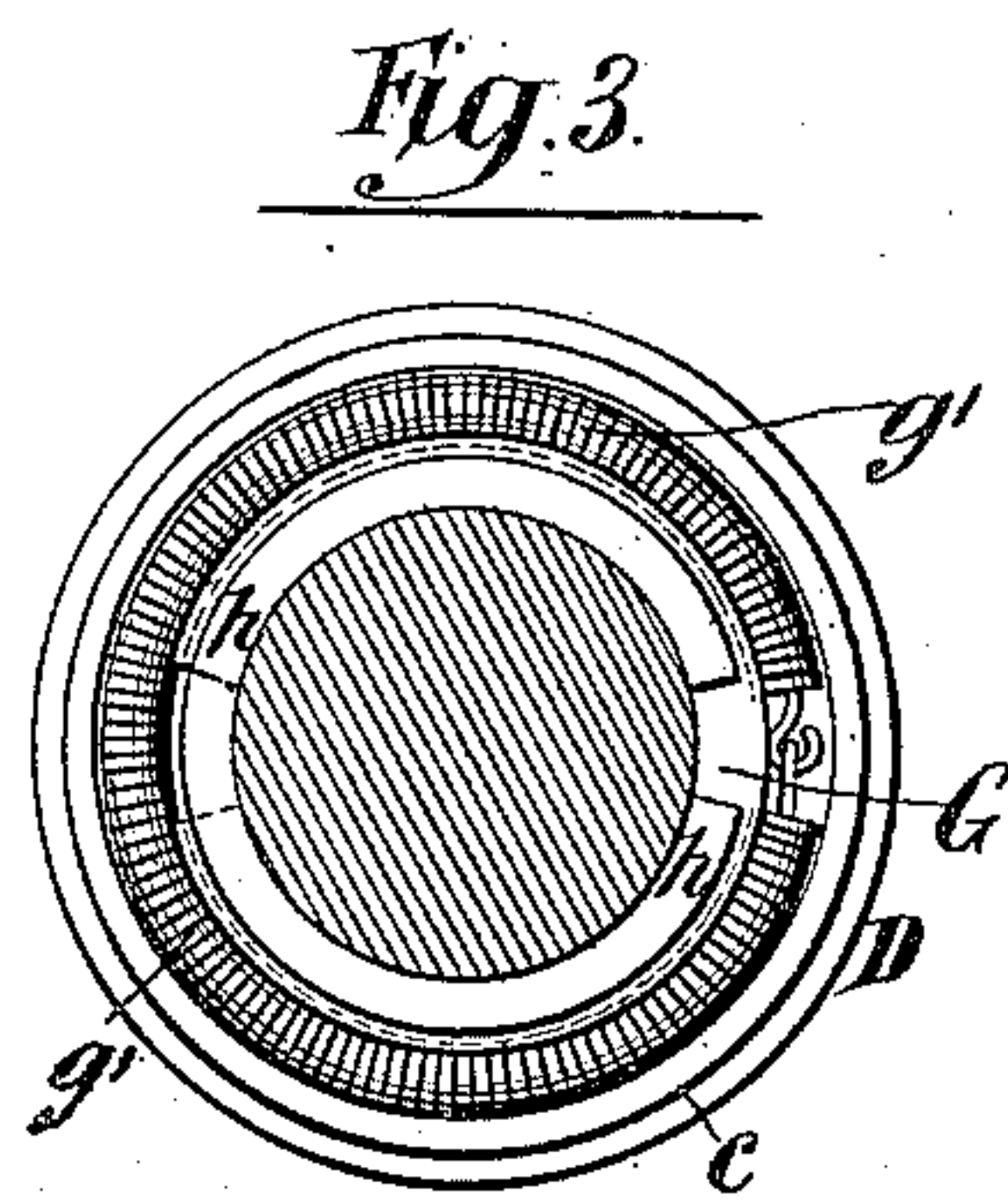
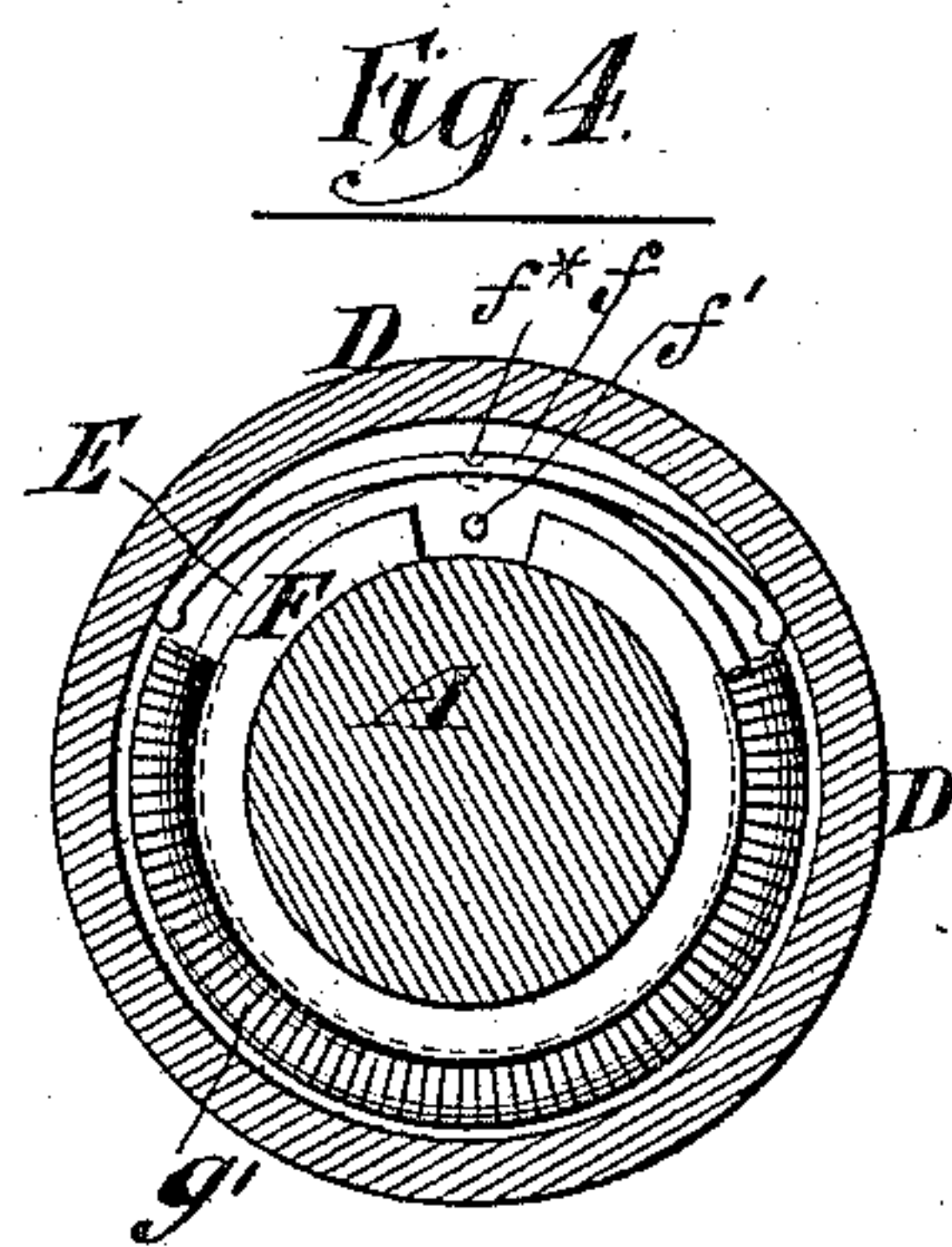
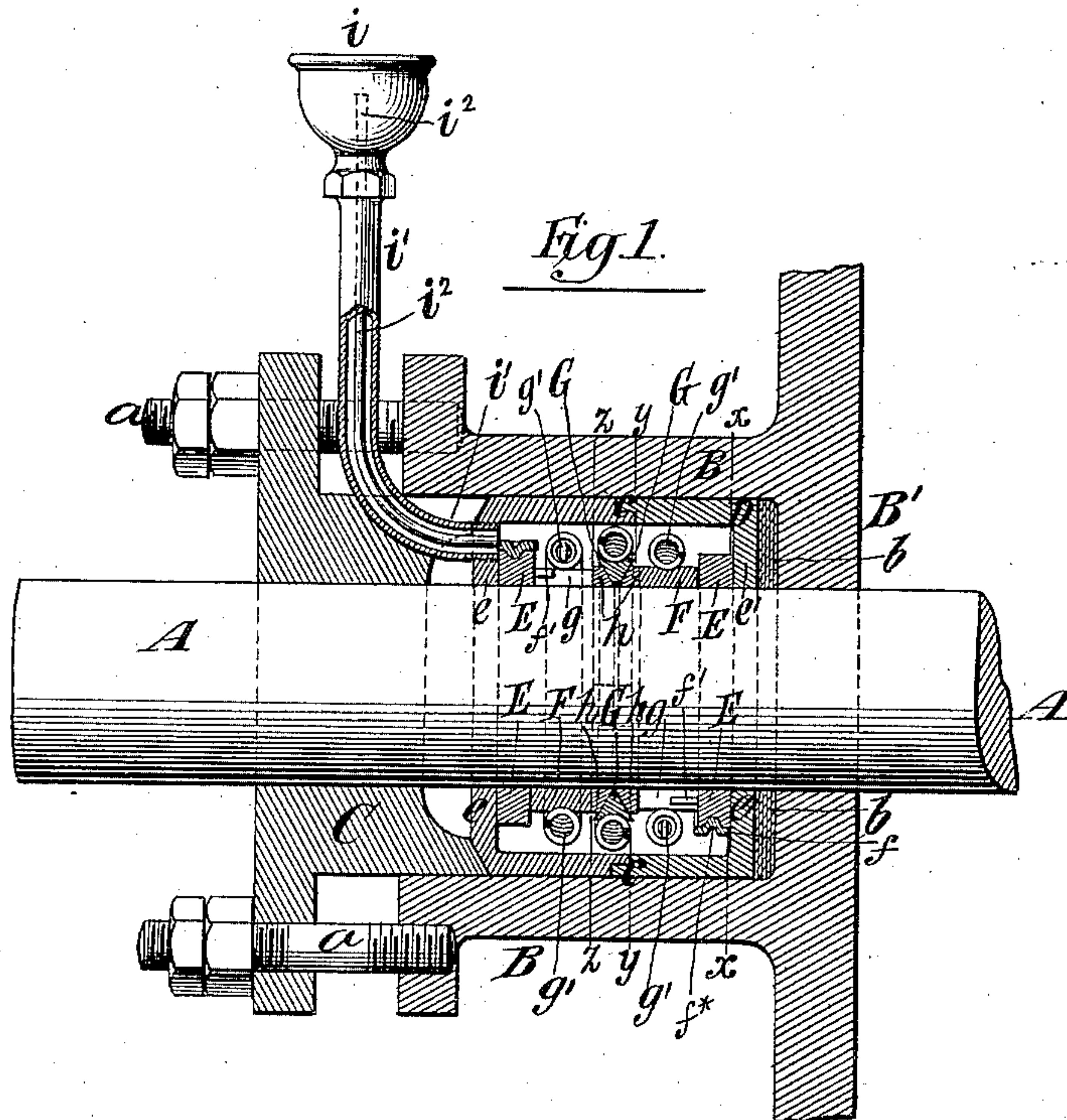


(No Model.)

J. D. RICHARDSON.
PACKING FOR STUFFING BOXES.

No. 307,592.

Patented Nov. 4, 1884.



Witnesses:—

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UNITED STATES PATENT OFFICE.

JOHN D. RICHARDSON, OF BROOKLYN, ASSIGNOR OF ONE-HALF TO FRANK
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PACKING FOR STUFFING-BOXES.

SPECIFICATION forming part of Letters Patent No. 307,592, dated November 4, 1884.

Application filed June 4, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. RICHARDSON, of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Packing for Stuffing-Boxes, of which the following is a specification.

My invention relates to that class of piston-rod packing for stuffing-boxes in which metallic rings are caused to hug the rod tightly by spring-pressure, and in which the packing-rings are set up or adjusted automatically by such springs, and without any adjustment of the gland to compensate for wear.

The invention consists in novel combinations of parts, which are hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a longitudinal section of a stuffing-box and packing embodying my invention, also representing a portion of a piston-rod. Figs. 2, 3, and 4 are transverse sections taken, respectively, on the dotted lines *xx*, *yy*, *zz*, Fig. 1, the stuffing-box itself being omitted from these figures; and Fig. 5 is a transverse section of the piston-rod and a divided spring-actuated ring embodying a modification of my invention, and hereinafter described.

Similar letters of reference designate corresponding parts in all the figures.

A designates the piston-rod, B the stuffing-box, and C the gland of the stuffing-box, which is secured thereto by bolts *a*.

The stuffing-box may be specially constructed for my packing, or I may apply the invention to an ordinary stuffing-box. The stuffing-boxes of locomotive-engines commonly have in the bottom a brass ring, the back of which is flat or square and fits against a flat seat at the bottom of the stuffing-box, and the outer face of which is beveled or conical to receive and crowd inward the packing. When such is the case, I remove this brass ring, and in the bottom of the stuffing-box I place a packing washer or gasket, *b*, of asbestos or other suitable material. Upon the asbestos washer or gasket *b*, I place a packing-box, D, composed of two parts bored to fit snugly on the rod, and connected by a rabbeted ground joint, *c*. The gland C has a bearing against the packing-box D, and by tightening the nuts

of the bolts *a* the box D is pressed on the packing-washer *b*. Any steam which escapes through the cylinder-head B' around the rod A cannot pass around the outside of the packing-box D, because prevented by the packing washer or gasket *b*, and can therefore only pass to the interior of the packing-box, if it has any escape at all. Whatever steam may enter the packing-box D cannot escape through the ground joint *c*, and hence the packing within the box D has only to prevent the escape of steam directly through the box D and around the rod A.

The essential features of my packing are a divided ring, spring-bound or embraced so as to contract it upon the rod as it wears, the gap in the ring permitting its ends to come toward each other as it is thus contracted, and an undivided ring having a bearing against the end of the packing-box continuously around the rod, and having a spring applied to it to press it against that side of the rod on which is the gap in the spring-bound divided ring.

The two rings above described are necessary elements of my invention; but in its more perfect form I employ two undivided rings, forming steam-tight joints with opposite ends of the packing-box and pressed against the rod by springs, two divided and spring-bound rings on the inner side of the undivided rings, the gap in each divided ring being on the side of the rod against which the adjacent undivided ring is pressed by its spring, and other divided and spring-bound wedge-rings placed between the two divided rings above referred to, and serving to prevent end-play of the rings and to keep the undivided rings pressed tightly against the ends of the packing-box.

EE designate the two undivided rings, which form ground joints with the two end walls, *e* *e'*, of the packing-box D, and which are snugly fitted to the rod A. Each ring E is pressed against the side of the rod by any suitably-arranged spring. As here shown, each ring is acted upon by a leaf-spring, *f*, which bears at the ends against the interior of the packing-box, and at the middle of its length upon the exterior of the ring E. The effort of the spring to straighten crowds and holds the ring E against the side of the rod at that point. As

shown in Fig. 1, the springs *f* press the rings E against opposite sides of the rod, and each spring *f* is held against displacement by a little teat, *f*^{*}, upon it entering a seat or cavity in the ring. From the inner side of each ring, at the point where acted on by its spring *f*, a small pin or spur, *f*['], projects inward, the purpose of which will soon be explained.

F F designate two divided rings, which are placed on the rod A close to the rings E. The rings F each have a gap, *g*, and are bound around and contracted upon the rod by a spiral-spring band, *g*['], or, if desired, by wire springs *g*^{*}, as shown in Fig. 5. These springs contract the divided rings F upon the rod, and the gap *g* in each ring permits of such contraction. The spiral-spring bands *g*['] have their ends joined, as shown in Fig. 3; but in Fig. 4 a portion of the spring-band is broken away to show the spring *f* behind it. The outer periphery of the divided rings F may be slightly grooved circumferentially, as shown in Fig. 1, to form a seat which will retain the spring-band and hold it against displacement. As before stated, the gaps *g* in the divided rings are at the points where the undivided rings are pressed against the rod, and the pin *f*['] on each ring E, entering the gap *g* in each ring F, holds the rings E F against turning relatively to each other.

Between the two divided rings F F are two other rings, *h h*, which may be divided or not, and which have their outer faces which bear on the rings F straight and their inner faces beveled, and between these two rings is a third divided ring, G, the faces of which are beveled to fit and wedge between the faces of the rings *h*, and which is contracted on the rod by a spiral-spring band, *g*[']. The divided ring G, as it is contracted on the rod, also presses the rings *h h* apart endwise of the rod, and so serves to press the divided rings F F against the two undivided rings E and hold the latter tightly against the end walls of the packing-box and all the rings in close juxtaposition. The undivided rings being kept snugly pressed upon the ends of the packing-box prevents the steam from passing between them and the ends of the box, and the contraction of the divided rings F prevents steam from passing along the rod, save at the gap *g*, where such escape is prevented by the bearing of the rings E on the rod at the gaps *g*. In this way I obtain a very tight and durable packing, which will wear the rod smooth and not cut it.

In ordinary running of a locomotive steam and moisture on the rod will be a sufficient lubricant; but in some cases—as in running down a long grade—it may be desirable to lubricate the packing.

I have shown an oil-cup, *i*, as connected by a tube, *i*['], with the packing-box D, and an air-escape tube, *i*², extending within the tube *i*[']. I may use a self-feeding lubricator in place of the simple oil-cup, if desired. This oil-cup or lubricator supplies the lubricating material directly to the interior of the packing-box D and to the packing-rings without ad-

mitting it to the space inside of the stuffing-box B outside of the packing-box D.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a stuffing-box packing, the combination, with a divided and spring-bound ring capable of contraction upon the piston-rod, of an undivided ring at the side of the divided ring, and a spring applied to the undivided ring to press it upon the side of the rod on which is the gap in the divided ring, substantially as and for the purpose herein described.

2. The combination, with a packing-box for insertion into a stuffing-box, and adapted to receive the piston-rod through it, of an undivided ring having a bearing on one end of the packing-box, a spring for pressing said ring against said rod, and a divided and spring-bound ring at the side of said undivided ring, arranged with its gap at that side of the rod against which the undivided ring is pressed, substantially as herein described.

3. The combination, with the packing-box D, of the undivided ring E, with the pin *f*['], the divided ring F, having the gap *g*, the spring-band for contracting the ring F on the piston-rod, and the spring *f*, for pressing the ring E against the rod on the side of the gap *g*, substantially as herein described.

4. The combination, with a packing-box to be inserted into a stuffing-box and to receive the piston-rod through it, of undivided rings contained within and forming tight joints with the ends of the packing-box, springs for pressing said rings against the piston-rod, and divided and spring-bound rings for embracing the rod, each arranged with its gap on the side of the rod against which the adjacent undivided ring is pressed, substantially as and for the purpose herein described.

5. The combination, with a packing-box for insertion into a stuffing-box and adapted to receive the piston-rod through it, of undivided rings at the ends of the box, forming tight joints with the inner sides thereof, divided and spring-bound rings bearing against said undivided rings and serving to embrace the rod, springs applied to said undivided rings for pressing each of them against the rod at the side on which is the gap in the adjacent divided ring, and a divided and spring-bound wedging-ring serving to keep all the rings in close juxtaposition and to prevent their end-play in the packing-box, substantially as and for the purpose herein described.

6. The combination, with the divided packing-box D, having a ground joint, *c*, of the undivided rings E and their springs *f*, and the divided and spring-bound rings F, serving to prevent the ingress of steam to and its egress from the packing-box D, all substantially as herein described.

7. The combination, with the divided packing-box D, of the undivided rings E, their springs *f*, and the divided and spring bound rings F, serving to prevent the ingress of steam to and its egress from the packing-box, and

the divided rings *h h* and divided and spring-bound wedging-ring C, serving to prevent end-play in the packing-box, all substantially as herein described.

- 5 8. The combination, with the stuffing-box and the packing-box inclosing the packing-rings and inserted therewith into the stuffing-box, of a lubricator connected with the said

packing-box for the supply of lubricating material directly to the interior of said packing-box, substantially as herein described. 10

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Witnesses:

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